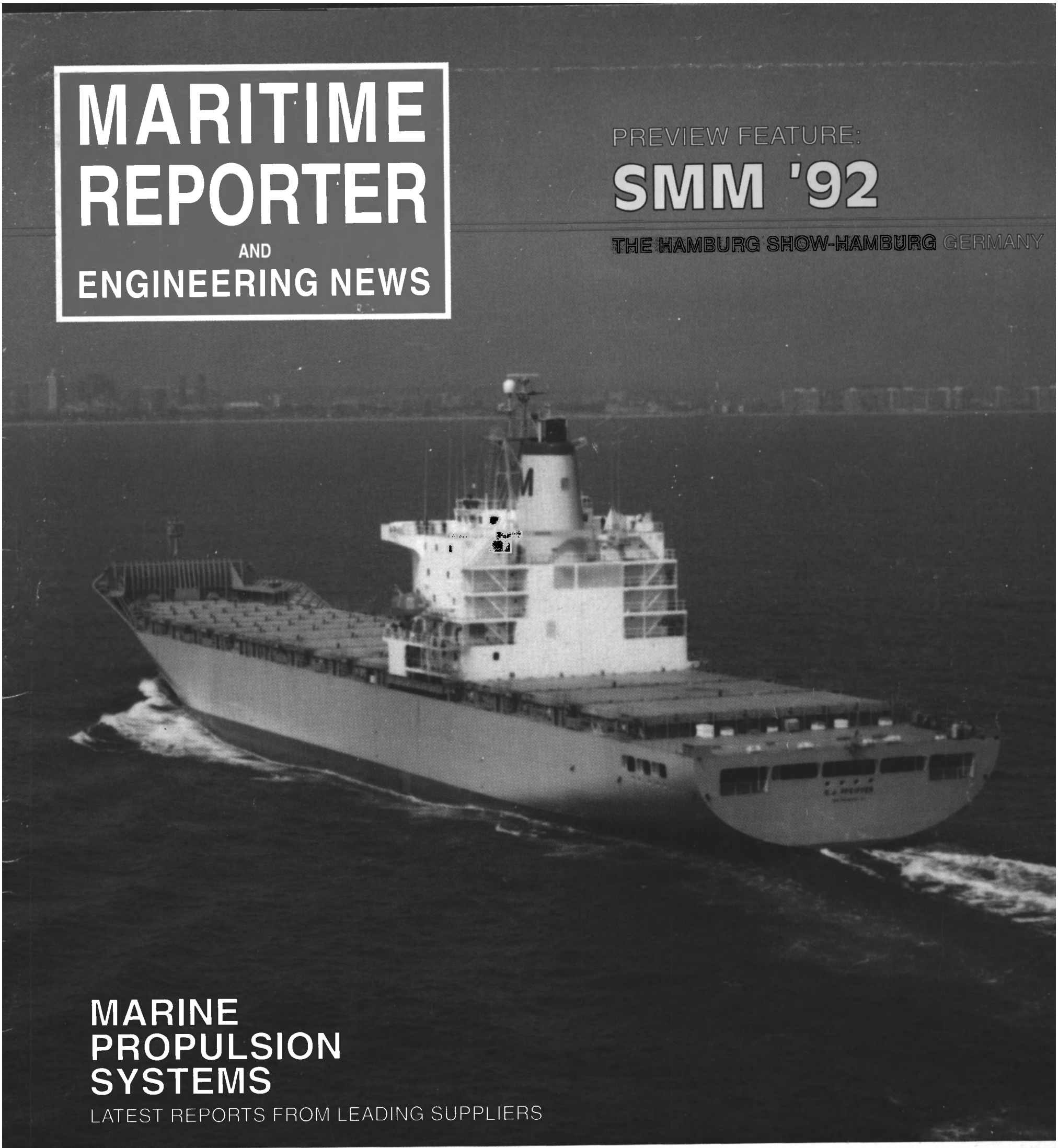
MARITIME REPORTER
AND
ENGINEERING NEWS

PREVIEW FEATURE:

SMM '92
THE HAMBURG SHOW-HAMBURG GERMANY

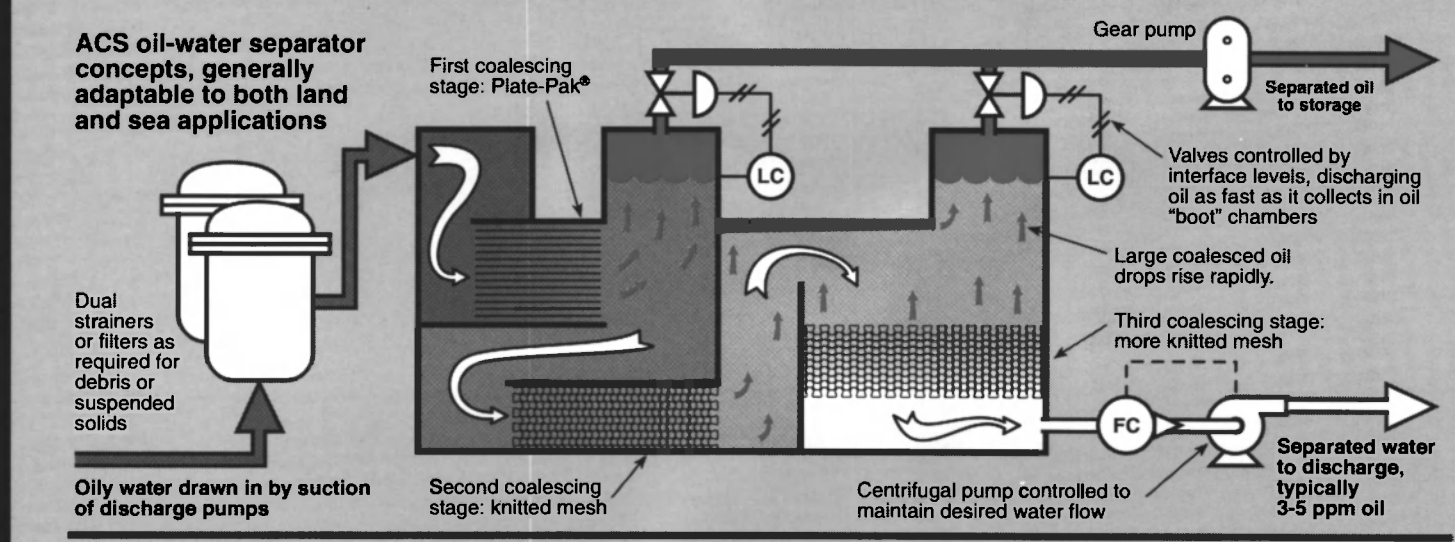


MARINE PROPULSION SYSTEMS
LATEST REPORTS FROM LEADING SUPPLIERS

GERMANY
MARITIME INDUSTRY REVIEW

SPAIN
MARITIME INDUSTRY REVIEW

NAVAL TECHNOLOGY & SHIPBUILDING
SEPTEMBER 1992



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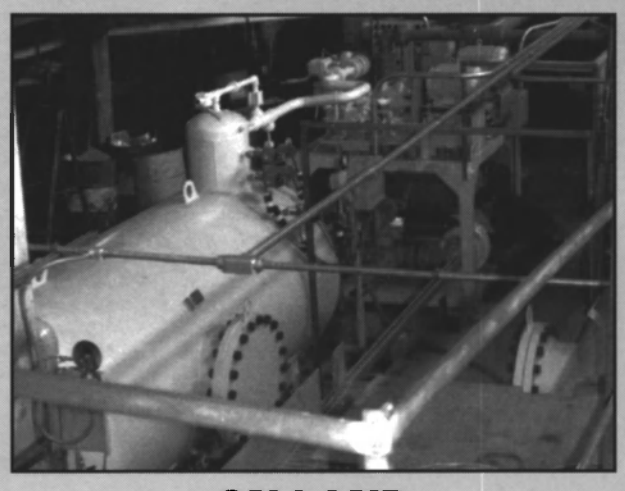

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ON THE COVER

The MV R.J. Pfeiffer containership constructed by National Steel & Shipbuilding Company (NAASCO) of San Diego for Matson Navigatio is to be used on the shipowner's Pacific Coast-Hawaii route. For more details on the R.J. Pfeiffer see page 91.

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Two More Seismic Survey Vessels Ordered From Ulstein

Two more seismic survey vessels were recently ordered by Litton, Inc. for its Western Atlas oil field subsidiary based in Houston, Texas.

Both ships will be built by Ulstein Verft AS, Ulsteinvik, Norway. They will be 255 feet long ad cost a total of about $60 million. Both ships will be used for oil and gas exploration projects throughout the world.

The Ulstein Group also built four other ships for Litton last year.

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Millions Approved For Title XI Program

The House and Senate may have cleared the way for almost $1 billion in commercial financing for new, militarily useful ships by approving up to $50 million for the U.S. Maritime Administration's (MarAd) federal ship financing program, known as Title XI.

Nearly $45 million was approved in the Senate and $50 million in the House while each chamber considered two separate $22 billion appropriations bills for the departments of Commerce, Justice and State. Each measure included funds for MarAd, the Federal Maritime Commission (FMC) and National Oceanic and Atmospheric Administration (NOAA).

Under the new loan guarantee amendments, introduced in the Senate by Senator **John Breaux** (D-La.) and in Congress by Representatives **John P. Murtha** (D-Pa.) and **Randy Cunningham** (R-Calif.), shipowners whose risk of default on shipbuilding loans is calculated to be 5 percent, will be eligible for $881.6 million in commercial loans.

The Senate bill also provides $370 million in funding to maintain and increase MarAd's Ready Reserve Force (RRF) and $19.1 million to fund FMC operations, including the activation of the commission's automated tariff filing system in 1993.

Sea-Land Posts $5 Million Gain Despite Revenue Drop

Despite a continuing slump in military cargoes and civilian shipments Sea-Land Services Inc. increased its operating income by $5 million in the second quarter.

Although the company experienced a $51 million decline in revenue over the period, Sea-Land offset that and restored $48 million by improving its cargo mix and raising prices. Additionally, the company saved $8 million by cutting expenses, which included paring 500 employees from its 9,000-strong work force.

Container Companies Chartering Tramp Ships For Busy Trade Routes

Reports indicate that containership companies are chartering tramp boxships at higher rates and for longer periods of time in order to increase their capacities in the booming intra-Asian, Europe-to-Asia and South American trades. At the same time, they are cutting their container capacities in the less-profitable trans-Pacific and Atlantic markets.

As ship demand outpaces supply, carriers are forced to pay increasingly higher charter rates to shipowners. The average daily rate for chartering a typical tramp 1,200-TEU containership reached $14,064, or $11.72 per TEU slot, in July according to brokers. This is an unusually large, short-term increase of 1.7 percent over the $11.52 paid during the month prior. Over the long term, this translates into an 8.2 percent rise over the $10.83 paid in July 1991 and 26.7 percent above the $9.25 rate that prevailed in July 1990.

In addition to the higher rates, liner companies are moving beyond the traditional six to 12 month long charters and are now locking up vessels for as long as 18 months.

Bisso Helps Launch 750-Ton Crane Barge

Bisso Marine Company, Inc. of New Orleans assisted Alabama Shipyard in launching a 750-ton crane barge. Bisso's 700-ton D/B Cappy Bisso and Alabama Maritime Corporation's 300-ton gantry crane were used for the project. The launched barge, outfitted with a 100-ton crane, will be used by the U.S. Navy.

For free literature on Bisso Marine Company, Inc.,

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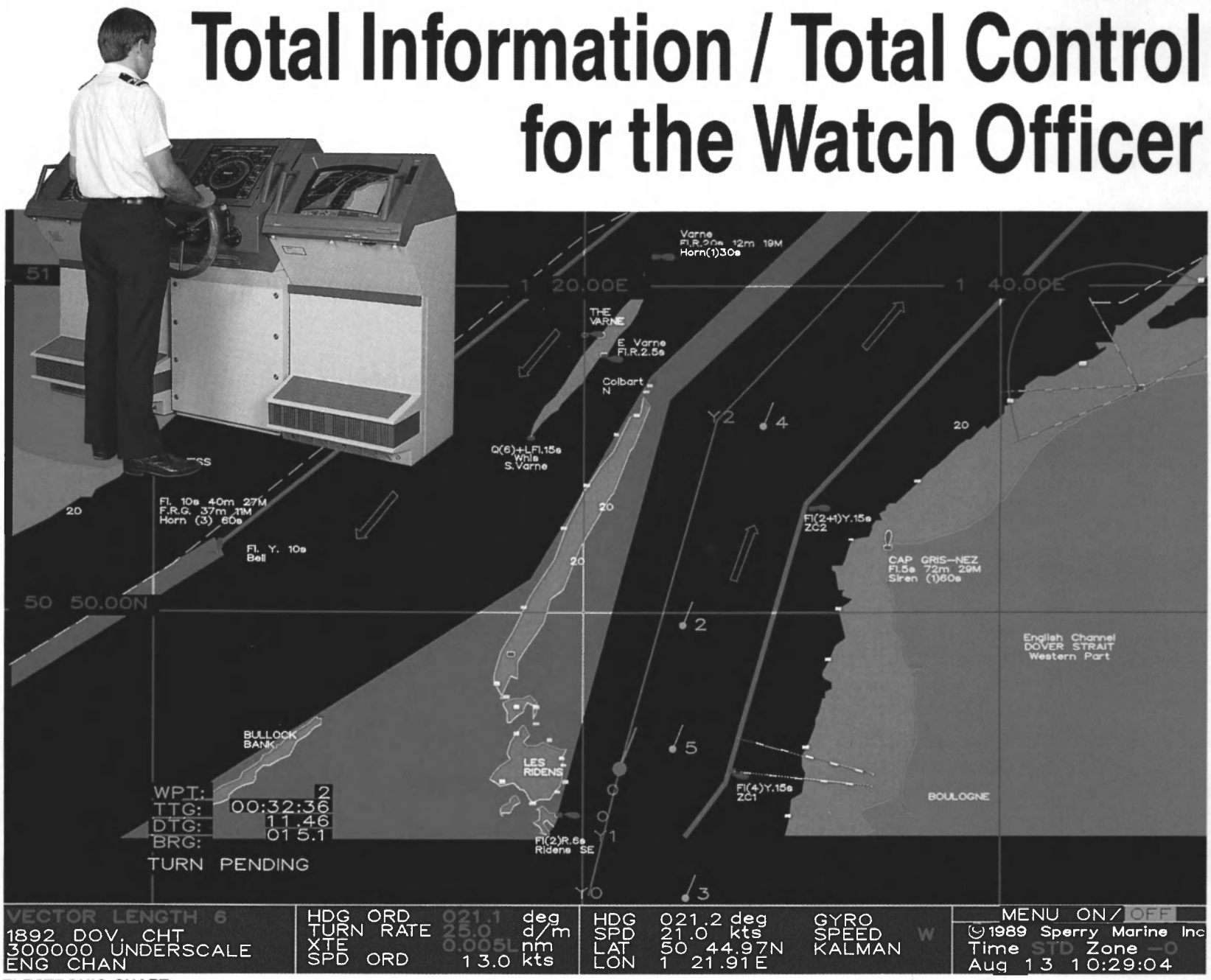
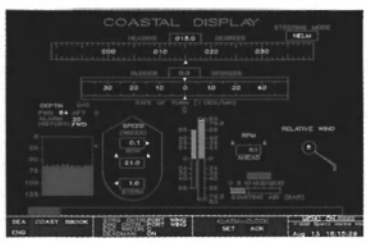
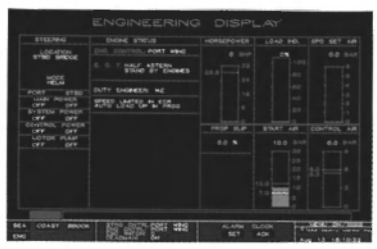
Total Information / Total Control for the Watch Officer



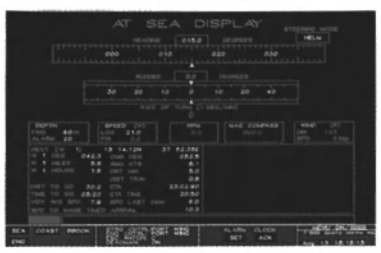
ELECTRONIC CHART



COASTAL DISPLAY



ENGINEERING DISPLAY



AT SEA DISPLAY

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Crowley Maritime Announces Major Restructuring

Following nearly a year of planning and preparation, Crowley Maritime Corporation of Oakland, Calif., has completed the restructuring of its organization, separating its businesses into two major operating units.

Effective August 1, Crowley's liner services businesses are being conducted by Crowley American Transport, Inc., and all marine contract services are being conducted by Crowley Marine Services, Inc. The two companies are direct subsidiaries of Crowley Maritime Corporation, which now operates as a holding company.

In his formal announcement, Crowley Maritime Corporation Holding Company president and COO, **James B. Rettig** said, "The separation of Crowley's liner services business from its contract services business reflects the different operational requirements, risks, markets, financing needs and customers of these businesses, and will increase the market concentration and operational efficiency of each."

Crowley American Transport (C.A.T.), under the leadership of president **James J. Carey II**, provides liner services between the U.S., Central America, South America and the Caribbean.

Crowley Marine Services (C.M.S.), headed by president **Brent Stienecker**, provides worldwide contract and specialized marine transportation services, including tug assist, bunkering/lightering, environmental cleanup, oil transportation, petroleum terminaling and distribution, salvage, commuter ferry and tour passenger services. These specialized services are provided under the banner of Crowley Marine Services, including the following series of subsidiaries and divisions: Crowley Towing & Transportation Company; Catalina Cruises, Inc., a Crowley company; Red & White Fleet, Inc., a Crowley company; Crowley All Terrain Corporation; Crowley Environmental Services, Inc., a division of Crowley Towing and Transportation Company; Pacific Alaska Fuel Service, a division of Crowley Marines Services, Inc.; P.T. PATRA, an Indonesian joint venture; and Shaughnessy & Company, a division of Crowley Marine Services, Inc.

This restructuring comes during the company's 100th year of operation. "This new structure efficiently positions the companies to offer a greater level of service to our customers as we embark on our second century of operations," **Rettig** said.

With offices worldwide, both companies' executive offices will be based in Crowley Maritime Corp.'s headquarters in Oakland.

For free information on Crowley Maritime Corporation and each of its subsidiaries' capabilities,

Circle 44 on Reader Service Card

Sea-Land Joins Team Proposing Panama Boxport

Edison, N.J.-based Sea-Land Service, Inc., has joined an international consortium that proposes to build a container terminal on Telfers Island, Cristobal, Panama, and modernize Panama's freight transportation network. The $600-million project was recently presented to the Panamanian government for review.

Under the plan, Sea-Land would operate the five-berth Telfers Island terminal that would be used by ships serving the Panamanian market and Colon Free-Trade Zone, and act as a transshipment center for boxes bound for the Caribbean and Latin America.

The Panama Transshipment Center (PTC) Consortium, which consists of 11 construction, engineering and investment companies from Europe, the U.S., Japan and Panama, would also carry out major improvements to Panama's highway and rail infrastructure.

Evergreen Group of Taiwan has also proposed a $30 million Telfer Island container terminal that it has decided to make available to all shipping lines, placing it in direct competition with the PTC Consortium's complex. The consortium had hoped that Evergreen's terminal would only be used by that company's fleet.

International Shipholding Signs Agreement With GD For MPS Squadron

International Shipholding Corporation, New Orleans, recently signed an agreement with General Dynamic Corporation, St. Louis, Mo., for the purchase of its Quincy, Mass.-based subsidiary, American Overseas Marine Corporation (Amsea) and its four-ship Military Prepositioned Ship Squadron (MPSRON) 3 based in Guam.

There are presently three MPSRONs operated by commercial companies on behalf of Military Sealift Command. MPSRON 1's four vessels off North Carolina are operated by Waterman Steamship Corporation, New York, a subsidiary of International Shipholding. MPSRON 2 is positioned off Diego Garcia and its five ships are operated by Maersk Lines Limited (MLL), Madison, N.J., the U.S. subsidiary of Copenhagen, Denmark-based A.P. Moller-Maersk. All ships are U.S.-flagged and each squadron carries the equipment and supplies needed by a Marine Brigade for one month.

MLL made an initial offer for Amsea, but concerns were raised over a foreign-owned company having a controlling share of U.S. strategic sealift assets. Members of Congress petitioned for International Shipholding to be given preference over MLL.

The agreement must now be reviewed by the Securities and Exchange Commission and the Departments of Defense and Transportation.

Willard Names Kagy Engineering Director

Willard Marine announced that **Brian S. Kagy** has joined the company as director of engineering, a new position within the company. Mr. **Kagy** will be responsible for marine engineering, project management and engineering liason with government program offices. Previously, Mr. **Kagy** held marine systems and ship integration engineering positions with General Electric Company and Tracor Applied Sciences, and served as a shipboard officer in the U.S. Navy.

Willard Marine, in business more than 35 years, is one of the largest manufactures of RIB's in the U.S. Willard is the principal supplier of RIB's and other ship's boats for the U.S. Navy, the U.S. Coast Guard, as well as building RIB's for commercial users.

For more information on Willard Marine, Inc.,

Circle 34 on Reader Service Card

House Approves $3 Billion In Water Projects Funding

The House Water Resources Subcommittee on the Water Resource Development Act of 1992 recently approved more than $3 billion for 24 new navigation, flood control and other Army Corps of Engineers water projects, including $1.4 billion for nine port and inland waterway projects.

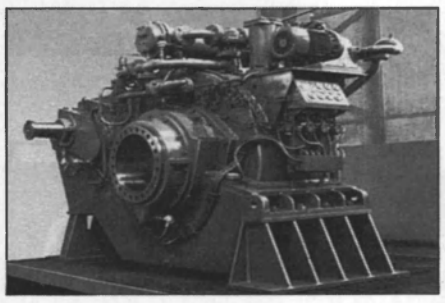
Under the bill, 37 projects previously authorized by the Corps of Engineers have been modified and the establishment of a demonstration project to study the use of material dredged from harbors and channels is authorized. It directs the Corps of Engineers and the Environmental Protection Agency to conduct a one-year review of contaminated dredge sediment removal, pretreatment and decontamination technologies.

After the review, a five-year demonstration program would be set-up in harbors on each coast to assess the selected technologies. Baltimore harbor would also be studied to establish criteria for determining when dredged material should be placed in contaminated sites or when it can be used in beneficial projects, such as wetlands creation and beach restoration.

Another provision of the House measure makes the harbor maintenance trust fund available to help pay for dredge material disposal areas.

Lohmann+Stolterfoht Brochure Details Power Transmission Products

Lohmann+Stolterfoht produces marine propulsion equipment ranging from marine gear units to couplings, clutches and bearings. The equipment has been installed aboard vessels such as fishing boats, workboats, yachts, dredges and ferries.



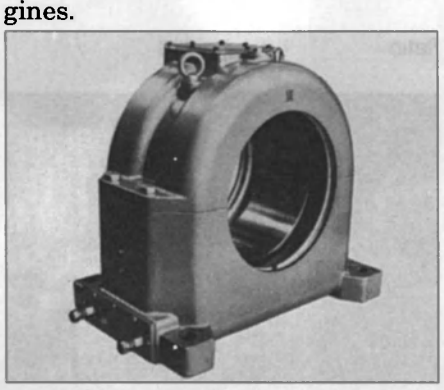
Navilus GUG speed-increasing alternator gear

The company's GUU reverse reduction gear units, produced under the trademark Navilus, are reported to be lightweight and compact in design which make them ideal for installation aboard high-speed vessels. The units are available with bell housing or as an input unit with the shaft on the same side.

The GW reinforced gear units are designed for high power transmission under heavy service conditions and are available in four configurations. The configurations are coaxial (GWC), vertical offset (GWS), diagonal offset (GWD) and horizontal offset (GWH).

Lohmann+Stolterfoht also offers reduction gear boxes for controllable pitch propellers or direct reversible engines. The company claims that its gear units cover the complete range of existing medium speed diesel engines. The units for these applications are the GCS/H, GUC/H and GUO. GCS/H-P gears with a built-in PTO are also available.

The GUT reduction unit is compact due to its split power transmission. These units have coaxial shafts for use on vessels with diesel engines.



Radilus propeller shaft bearing

The GVA and GVG type reduction units allow the power from two or more engines to be combined to drive a single propeller.

The company manufactures alternator gear units, cutter head drives, electronic controlled clutches, plain and thrust bearings, gear units for sand pumps, electric generators, winch drives and complete hydraulic installation packages.

The company's clutches, couplings and bearings are manufactured under various trade names such as Spiroflex, Pneumaflex, Pneumastar, Radilus and Axilus.

Spiroflex couplings are torsionally flexible rubber elements which are said to be able to reach a torque of 36,370 kW at 250 rpm.

The Pneumaflex and Pneumastar clutches are torsionally flexible and stiff, respectively. The Pneumastar clutch is used if the coupling is separated from the clutch especially in gears of quillshaft design and PTO applications.

Propeller shaft bearings, Radilus, and thrust bearings, Axilus, are available in standard designs, as well as for heavier operating conditions such as those aboard an icebreaker or for dredging.

For a copy of the brochure detailing the products offered by Lohmann+Stolterfoht,

Circle 154 on Reader Service Card

New England Trawler Expands Engineering Staff

New England Trawler Equipment Company has added **Lawrence W. Hills** as a new senior design engineer. A graduate of Lewis and Clark College, Mr. **Hills** received a B.S. in mechanical engineering from Brigham Young University. Mr. **Hills,** who has extensive experience in the areas of product system design, project management and field installation and trouble shooting, joins the company after more than 10 years with Raytheon in the Submarine Signal Division. There, as senior engineer, mechanical systems, he led projects in a wide assortment of marine applications including deck machinery and ship machinery systems. Prior work experiences include Woods Hole Oceanographic Institute and David W. Taylor Naval Ship Research and Development Center. Mr. **Hills,** who speaks both Italian and Spanish, has directed installation and sea trials of sonar towing systems in Spain, Italy and Egypt. He developed and taught a system operational and maintenance training course for the officers and technical personnel of the Italian Navy.

For free information on New England Trawler Equipment Company,

Circle 135 on Reader Service Card

Norcontrol, Atlantis Awarded $9 Million Canadian Order

The Canadian Coast Guard, Ship Safety Branch, has awarded contracts for the delivery of four Blind Pilotage Simulators and five Marine Control Room and System Simulators to a consortium consisting of Norcontrol Simulation a.s. and Atlantis Aerospace Corporation.

These contracts represent a value of approximately $9 million including the Canadian content.

The Norcontrol contract calls for four Blind Pilotage Simulators, each with four Own Ship Cubicles with navigation equipment currently being used in the Canadian merchant marine, and five Norcontrol Propulsion Plant Trainers (marine control and systems simulators), each simulating and enabling for training on two different ship motor types, MaK and Sulzer.

A student performance and examination system will be part of the delivery. The delivery program has started and will be completed by August 1994. The simulators are scheduled to be installed in different marine institutes and colleges throughout Canada.

For free information on Norcontrol simulators,

Circle 136 on Reader Service Card

NRC Appoints New Vice President of Operations

The National Response Corporation (NRC) recently announced the appointment of **Stan Cwiklinski** as vice president of operations. A graduate of LaSalle University in Philadelphia, Mr. **Cwiklinski** joins NRC from Phillips Cartner & Company, Inc. (PCCI) where he was a primary oil spill response field operations manager since 1988. Previously he had been a special operations warfare officer in the U.S. Navy, completing his career with the rank of Commander.

Mr. **Cwiklinski** brings more than 25 years of hands-on, field-tested experience to the NRC management team. In the Navy he operated for nine years on salvage, rescue and diving ships, and coordinated Atlantic Fleet oil spill pollution abatement/control readiness and rapid-response efforts.

With PCCI he directed major spill response operations for the U.S. Navy Supervisor of Salvage (SUPSALV) during, among others, the Exxon Valdez and American Trader spills. Most recently he established the Emergency Persian Gulf Ship Salvage Material Storage and Maintenance Base for SUPSALV during Operation Desert Storm.

Hempel Appoints New Board Member

Leif Juul Jorgensen, president and chief executive officer of the Hempel Group, has announced the appointment of **J.G. Davis** C.B.E. to the Board of Directors of Hempel Paints Limited in London.

Mr. **Davis** is well known in marine circles, in particular through his chairmanship of the International Maritime Industries Forum. The appointment is part of Mr. **Jorgensen's** strategy of strengthening Hempel world-wide for the challenges of the future.

Bisso Marine Awarded Salvage Contract

Bisso Marine Company, Inc., New Orleans, has been awarded the salvage contract to raise the 200-foot by 45-foot lineboat M/V Chris Way MacMillan. The vessel is sunk at mile 106.8 of the left descending bank near the Huey P. Long Bridge on the Mississippi River. The salvage operation began August 17, 1992.

The company has also completed the salvage operation of the dredge Port Arthur on the Mississippi River in New Orleans. The vessel sank on her port side on June 28, 1992. Bisso used three of its derricks to raise the 1,400-ton vessel to the surface.

For more information on Bisso Marine Company, its capabilities and services,

Circle 160 on Reader Service Card

Autronica Wins Orders Worth $11.2 Million From Kvaerner Shipyards

After intense competition, Autronica Marine, of Oslo, Norway, has won NOK 65 million ($11,154,000) in major orders from the Kvaerner Kleven and the Kvaerner Govan shipyards for equipment to outfit three vessels on order for Odfjell and six ships for Storli.

Autronica will deliver cargo control and monitoring equipment based on the company's GL-90 radar level gauging system, ballast and service tank temperature sensors and pressure transducers, and machinery control and monitoring equipment for all vessels.

For the Storli ship account, Autronica will deliver condition control equipment and an MIP-calculator.

The orders require equipment delivery from 1992 until 1995.

To receive more information about the services and product lines available from Autronica Marine,

Circle 25 on Reader Service Card

Willard Marine Names Fred Meyers Services As New Rep

Willard Marine, Inc. of Anaheim, Calif. has appointed Fred Meyers Services of Seattle, Wa., as a representative for the Northwest states. Fred Meyers Services will handle all the sales of Willard Marine's Sea Force line of Rigid Inflatable Boats (RIB's) and other commercial craft in Washington, Oregon, Alaska and Idaho.

Willard Marine, in business more than 35 years, is one of the largest manufacturers of RIB's in the U.S. Willard is the principal supplier of RIB's and other ship's boats for the U.S. Navy, the U.S. Coast Guard and other commercial users. Fred Meyers Services has been a manufacturer's representative for commercial marine equipment in the Northwest for 10 years. For free information on Willard Marine Inc.,

Circle 33 On Reader Service Card

Funding Approved For $206 Million Expansion Of JAXPORT

A permanent funding mechanism was recently approved for the largest expansion project in Jacksonville Port Authority's (JAXPORT) history. The funding will reportedly provide the port with about $6 million a year.

The approval of this funding mechanism by the Jacksonville City Council will reportedly allow JAXPORT to develop about 1,000 acres of new deepwater port facilities sometime about the beginning of 1993. About $206 million in city revenue bonds would be issued to fund phase one of the port expansion. The initial bond issue is reported to come as early as December 1992.

Suez Canal Reports Earnings At $900 Million For First Half Of 1992

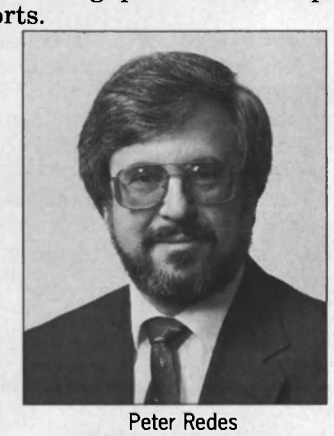
According to the Suez Canal Authority the money received from the tolls charged for shipping through the canal reached $900 million dollars for the first half of 1992.

On the average about 50 ships pass through the canal each day which brings about $5 million in tolls. The Canal Authority estimates that about 8,353 ships passed through the canal during the first six months of this year.

Revenue for 1991 was estimated at $1.5 billion and the authority hopes to earn $2 billion this year.

Peter Redes Named Engineering Manager Of Raytheon Marine Company

The president of Hudson, N.H.-based Raytheon Marine Company, **Carsten Peters**, has announced the appointment of **Peter Redes** as the company's new engineering department manager. He will be responsible for the development of commercial shipping products, which includes supervising the company's recreational and commercial fishing product development efforts.



Peter Redes

Mr. **Peters** stated that: "**Redes** brings a tremendous amount of strength and experience to this position. He has been the radar engineering manager for 11 years and has contributed greatly to our success in the high seas radar market. His proven engineering track record will position us well for continued future growth."

Bringing 15 years of progressive engineering experience within Raytheon to his new position, Mr. **Redes** many accomplishments include the development of the Pathfinder/ST™ radar line, radar collision avoidance system (RACAS) and vessel traffic systems (VTS). He holds two patents for marine radar units.

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In August, IDB Mobile inaugurates its new IOR service from Gnangara, Australia, which will allow customers to access IDB Mobile in any ocean region via LES ID 13-1 octal or LES ID 11-1 decimal.

IDB Mobile introduces global pricing-the same low price available in all four ocean regions.

Better Added Values in addition to supporting all commercial electronic mail services, IDB Mobile distributes and administers SprintMail service to maritime and aeronautical users. One local call allows you to send messages and data files; off-peak hours save you even more!

One-Stop Shopping, Service and Hardware
IDB Mobile leads the industry in land mobile installations in Russia, the Commonwealth, and other remote locations. Through an agreement with MORSVIAZSPUTNIK, IDB Mobile can arrange PTT licenses, provide SES ID numbers and supply portable Satcom equipment in a matter of days.

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Most diesel engine oils are out of their element on the water.

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But not ours. Mobil has developed truly marine-specific oils. Formulated from the beginning to meet the difficult and different demands of the marine environment.

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And then we went even further We developed a marine oil for *each* of the three major OEM diesels in marine service.

Detroit Diesels? There's our Mobilmar® 100 Series oils. Caterpillars? Our Mobilmar® 300 Series oils. EMDs? Our Mobilgard® 450 oil. Each is designed for optimum performance in its specific engine.

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OTC Australia To Expand Mobile Satellite Communication Services

OTC reports that in little more than 18 months since it opened, an advanced $35 million satellite earth station in Perth, Australia, operated by OTC Australia, has grown to become one of the largest of its kind in the world, providing ships with quicker, cheaper and easier direct-dial telephone, telex, fax and data communications services to and from anywhere on the globe.

With a wide range of channels for quicker connection and less congestion, OTC's innovative marketing initiatives offer: lower tariffs and a simplified tariff structure to facilitate accounting procedures; optional direct billing facilities which save shipowner commission fees; quantity discounts on calls, with concessional packages tailored to individual needs and no VAT or GST charges.

Last year, Australia's earth station launched commercial Inmarsat-C communications service in the Pacific and Indian Ocean regions.

Inmarsat-C is a unique, compact low-cost mobile satellite data communications system designed for ships, commercial vessels and land mobiles, providing two-way 600 bps data/telex messages to and from virtually any location in the world.

OTC Australia, the international business unit of the Australian and Overseas Telecommunications Corporation, has now signed a contract with a Canadian supplier for the installation of equipment in Perth which in 1993 will make available a new generation of mobile communications services.

Inmarsat-B, which will provide enhanced facilities to those currently offered by Inmarsat-A, including voice and low and high speed data—and Inmarsat-M, a low cost voice service with compact transceiver that will even include briefcase phone models.

Unlike Inmarsat-A, which is an analogue system and outgrowing its available power and spectrum space, Inmarsat-B is a digital system providing higher quality with lower transmission costs.

Inmarsat-M provides similar facilities to Inmarsat-B but operates at a lower voice quality and fax speed to appeal to users who may be constrained by equipment size or cost. Ideal for boats, it is a significant step towards a multipurpose personal communicator. Inmarsat-M and Inmarsat-B will be marketed by OTC Australia as OTC Satcom-M and OTC Satcom-B.

Manned continuously around the clock, the dominating feature of OTC's earth station are two 18-meter parabolic dish antennas directed to Inmarsat's Indian Ocean and Pacific Ocean satellites, of similar design to those used in Australia's deep space radio telescope.

The "engine room" of the earth station comprises powerful radio transceivers, sophisticated computer systems and complex ground communications equipment.

Outbound signals from a ship are transmitted directly to the satellite and from there to the earth station for automatic connection with domestic and international telecommunications networks, with the reverse procedure for traffic in the opposite direction.

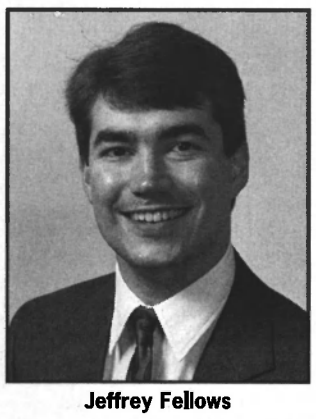
OTC's earth station transmitters which have an output of up to three kilowatts, operate on frequencies of up to 6 Gigahertz (6,000 MHz) and the capabilities of the system are so great that more than 330 individual messages/conversations can be handled simultaneously.

For free literature detailing the extensive communication services of OTC Australia,

Circle 179 on Reader Service Card

Raytheon Appoints Fellows Apelco Marketing Manager

It was recently announced by **Carsten Peters,** president of Hudson, N.H.-based Raytheon Marine Company, that **Jeffrey Fellows** has been appointed as marketing manager for Apelco Marine Electronics.



Jeffrey Fellows

In his present position, Mr. **Fellows** will be responsible for the sales, marketing and product planning for all Apelco accounts. In a strategic planning role since joining Raytheon Marine in 1984, he will retain all current responsibilities in addition to assuming the Apelco marketing management position.

"Jeffrey's past of managing long range product planning makes him ideally suited for his new responsibilities. Combined with his strong financial background, the Apelco line of products will certainly prosper under his leadership," said Mr. **Peters.**

Since joining Raytheon Company eight years ago, Mr. **Fellows** completed the company's Financial Management Development Program and has made significant contributions in cost accounting, credit management and long range new business and product planning.

Fincantieri's Computerized Hull Construction Project Progressing Successfully

At Fincantieri's shipyard in Monfalcone, Italy, a special project designed to automate the manufacture of ship's hulls through the use of computers and robots has successfully reached the half-way mark in development.

The five-year project, Flexible Automation in Ship Prefabrication (FASP), intends to develop computer managed robot machinery capable of cutting, welding and assembling the large and complex metal structures up to 300 tons used in ship construction. Once FASP is operational, the yard hopes to save 50 percent on labor costs for each hull built.

Automated production lines, such as those used in the automotive industry, have not yet been applicable to labor intensive shipbuilding due to the size of the components used and the flexibility necessary for varied, one-time shipyard projects.

The third and final stage of the project will involve the building of an actual robotized prototype workshop, scheduled for completion at the end of 1994.

Fincantieri is the project leader with Spain's Astilleros Espanoles shipyard and various other international engineering and design firms participating in the project. Italian companies are bearing 75 percent of the $116.7 million estimated cost, with the other 25 percent being shared by the foreign partners.

Decline In World Order Book Causes Shipbuilders To Lower Prices

A recent decline in orders for new vessels has forced shipbuilders to lower their prices, according to reports. From 1986 to 1991 prices for new ships had almost doubled but in recent months have seen a steady decline and a further drop in prices is expected in the near future.

According to a recent report by Howe Robinson & Co. Ltd. of London, the cost of a Panamax size dry bulk carrier has dropped from $35 million late last year to under $30 million at the present time. The prices for VLCCs have also fallen from almost $100 million to below $90 million.

The cause for the decline in new orders is reported to be the downturn of freight rates. The decline has caused a shipyards to become more competitive when dealing with prices and delivery of new vessels.

Alfa-Laval Focuses On Economical Life-Cycle Concept For The Engine Room

Alfa-Laval reports that it focus is now, more than ever, on preventive maintenance and total economy for the shipowner throughout the life-cycle of the ship. As well as spare parts, repairs, regasketing and other technical backup, Alfa-Laval offers full upgrading and replacement programs.

The company offers a wide range of oil treatment equipment, desalination plants and central cooling systems which are based on Alfa-Laval plate heat exchangers.

The CIP Cleaning-in-Place System allows for the bowl interior to be cleaned without opening the separator which allows for maintenance to performed about every 3,000 hours or three times a year as compared to every few weeks as is often the case today.

The company's Heatpac Electric Heating Systems are designed for heat treatment of detergent lubricating oils and fuels prior to centrifugal cleaning and fuel injection into diesel engines. The EHS system is reported to provide optimum heating of all types of mineral oils, sensitive lubricating oils and turbine oils.

Alfa-Laval also offers the MMPX Box-Oil Cleaning Plant, the Alcap Separation System, the Viscochief Automatic Viscosity Control System and many other systems for oil treatment.

Alfa-Laval Desalt offers desalination and cooling plants for the marine industry. The division recently introduced its new Plate Reefer Condenser which reportedly can be substituted for virtually any existing condenser and has a reported efficiency of two to three time that of traditional condensers.

Among Desalt's thermal systems is the D-PCU Engard™ Control System for central cooling systems which is reportedly designed for total optimization of centralized cooling water systems by combined control of freshwater temperature and seawater pumps.

Desalt also offers various types of distillers which operate off the waste heat from diesel engines or low pressure steam and require very little maintenance.

Alfa-Laval is a major supplier of oil treatment systems, desalination plants and central cooling systems to the marine and power industries worldwide, with service facilities in all major ports. Customers are served through subsidiaries and representatives more than 120 countries throughout the world.

For further information detailing the systems offered by Alfa-Laval,

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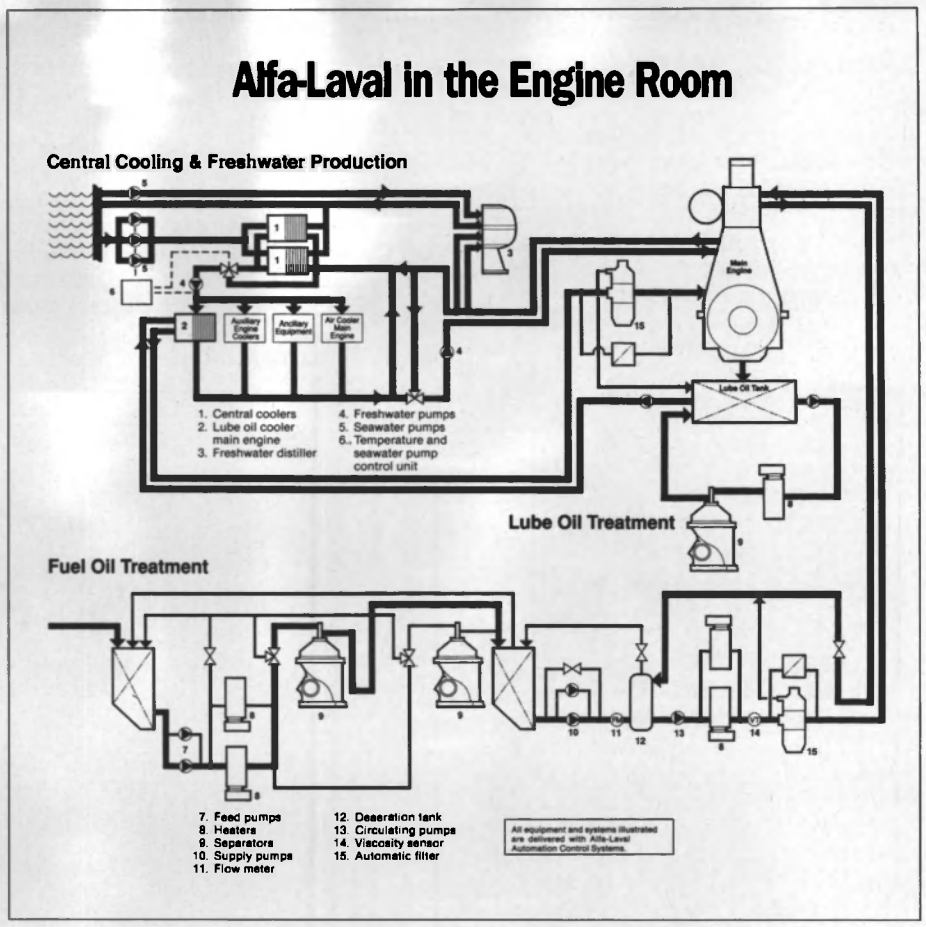


Fall 1992 Maritime Environmental Symposium

Naval Engineering and the Environment: Strategy for the 1990's

October 15-16, 1992
The McLean Hilton
Tyson's Corner, Virginia

In order to better support and educate more about our nation's maritime environmental issues, goals and strategies, the American Society of Naval Engineers is sponsoring the Fall 1992 Maritime Environmental Symposium to be held at the McLean Hilton, Tyson's Corner, Virginia.

Hear and discuss over 20 technical papers and presentations that are to be delivered by national and international experts on issues such as:

- **Current and Emerging Legislation and Regulations**
- **International Issues**
- **Waste Minimization**
- **Hazardous Material Management**
- **Shoreside Compliance and Restoration**
- **Oceanography - Global Change**
- **Environmental Education and Training**
- **R&D Requirements - Afloat and Ashore**
- **Spill Prevention, Dynamics and Clean-up**
- **Ship/Aircraft Systems/Equipment Design Impacts**
- **Environmental Information Systems**

This two day symposium is expected to attract more than 400 attendees representing the Federal Government, environmental organizations, and maritime industries. More than 25 exhibits will also be on display.

For more information in this symposium, contact Carol Hardee at 703/836-6727.

For information on displaying an exhibit, contact Nancy Westerman at 703/696-0865.

ABASCO Introduces New Emergency Response Oil Spill Kits

American Boat and Skimmer Company (ABASCO), manufacturer of oil spill response equipment since 1960, has introduced a new line of emergency oil spill response kits. These response kits were designed for the marine industry, and will allow towboat and tug boat operators, barge companies and other oil transporters to respond immediately to a small oil spill. The kits are available in four different models and configurations designed to respond to spills involving between five and 2,500 gallons of oil.

For free information on ABASCO's product line,

Circle 31 on Reader Service Card

Ten Oil Companies Agree To Stay 50 Miles Offshore On Alaska-California Route

Ten oil shipping companies have reportedly entered into a voluntary agreement to stay at least 50 nautical miles from the mainland of California when loaded with Alaskan crude and sailing between Alaska and California.

Reports state that the agreement is intended to provide added protection against oil spills.

The companies complying with this agreement are Arco Marine, Exxon Shipping Co., Phillips Petroleum Co., BP Oil Shipping Co., West Coast Shipping Co., Unocal, Chevron Shipping Co., Shell Oil Co., Texaco Inc., and Mobil Oil Corp.

Captains of the vessels involved in the Alaska-California route have reportedly changed their voyage plans to comply with the new 50-mile limit.

Intermarine USA Plans To Triple Savannah Yard Capacity

Intermarine USA recently announced that they have plans to triple the shipbuilding capacity of their Savannah shipyard. The expansion project is now in progress and will reportedly allow Intermarine USA to build three or more ship hulls per year, beginning in the spring of 1993.

According to Intermarine USA they started planning the expansion project in November of 1991 and completed engineering design following the award of a contract for three U.S. Navy minehunters in April of 1992.

As the facility nears completion, Intermarine will reportedly start to hire outfitting workers to complete the minehunters. At the peak of the U.S. Navy program, Intermarine claims that employment at the yard could increase to as much as 1,000.

Intermarine USA specializes in the application of fiberglass laminates in large marine vessels and assemblies. Minehunters built by Intermarine are reported to be extremely shock resistant and have been ordered by the United States, Italian, Nigerian and Malaysian navies. Intermarine also builds fiberglass patrol and utility vessels and is presently examining the application of their composite technology to commercial marine applications.

For more information about the services and facilities provided by Intermarine USA,

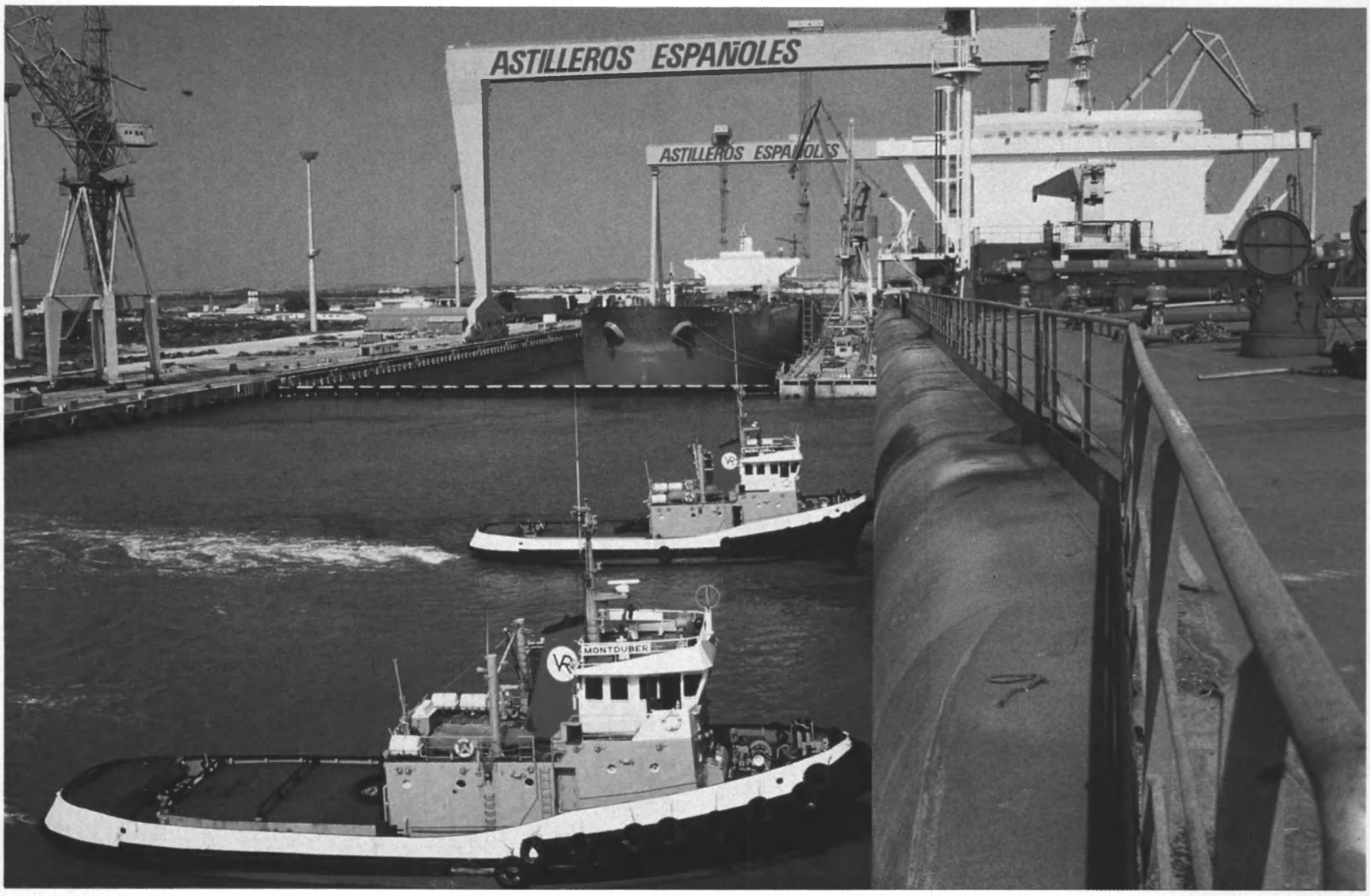
Circle 59 on Reader Service Card

Avondale Awarded $5 Million Contract To Build Towboat

Viking Maritec Inc.of Oakdale, Pa., recently awarded Avondale Industries Inc. a contract worth about $5 million to build the fourth in a series of 168-foot towboats.

Avondale completed the third towboat in the Viking 2000 design last year. This was the final delivery of a $20 million contract to Avondale. That contract is reported to be the first major towboat construction in the U.S. since 1962.

The new contact is expected to be completed with the vessel delivered by the middle of 1993. This vessel will also be of the Viking 2000 design.



SPANISH MARITIME INDUSTRIES

By Alfonso Gonzalez Ferrari,

Naval Architect and Marine Engineer,
Founder-President of A.G. Ferrari R&D Marketing International

Spain has a centuries-old maritime tradition, with over 2,400 miles of coast on the Iberian peninsula alone, and more than 3,700 miles of coastline in all. The Spanish maritime industry, long governed by tradition, began to evolve at the beginning of this century. The changes affected the entire maritime sector—shipping lines, shipbuilders, ports and coastal regulations, crews and general regulations concerning merchant and fishing activities.

During the 1950s, the "Law of Protection and Renovation of the Merchant Marine" was instituted. This law, in fact, was the first major step in boosting the national shipbuilding industry and was of substantial importance to the reorganization of the Spanish fleet in terms of growth and modernization.

During the '60s and early '70s, the Spanish merchant and fishing fleets expanded rapidly, accompanied by tremendous growth in the shipbuilding sector. As a consequence, subsidiary and allied marine support industries were formed, not only in Spain, but on a worldwide basis.

Founded in 1959, the Spanish shipbuilding association CONSTRUNAVES represented the interests of domestic yards in the European association AWES. During that same year, associations representing the equipment manufacturers, SERCOMBE and INDUNARES, were founded. Shortly thereafter, the shipowners association ANAVE was formed.

December 1969 marked the founding of Astilleros Espanoles, S.A. (AESA), the country's largest shipbuilding company. AESA provided Spain with an organization to compete with other world class shipbuilders. At the time, AESA consisted of eight shipyards, two engine factories, and two steel workshops, boasting an employment of about 20,000 workers, a production capacity of a million gross registered tons per year, and more than 400,000 bhp per year in the manufacture of two- and four-stroke engines. The controlling shareholder of AESA was the National Institute of Industry (INI), a government-run umbrella organization, holding 50 percent of the shares, with minority shares held by the Urquijo, Bilbao and Hispano-Americano Banks and private interests. Thus, one of the biggest shipbuilding companies in the world was born.

Up until the formation of AESA, the government-run shipbuilder E.N. Bazan was the major force in the national shipbuilding industry. Today, Bazan is largely involved in military vessel construction. Bazan, founded in 1947, operates three shipyards—the Ferrol shipyard on the northeast coast, the San Fernando facility on the southeast coast, and the Cartagena yard on the Mediterranean. The Ferrol yard can handle ships as large as 150,000 dwt.

Union Naval de Levante, a private company founded in 1924, has two shipyards on the Mediterranean coast, one in Valencia and the other in Barcelona, both employing a combined work force of over 1,000.

ASTANO (Astilleros y Talleros del Noroeste), a pioneer in building Very Large Crude Carriers (VLCCs), has grown to become one of the largest, privately held shipyards in the country, employing more than 2,000 people.

During the first half of the 70s, the Spanish shipbuilding industry ranked third in the world in terms of deliveries, with a total of 7.8 million gross tons.

During the period spanning 1965 to 1974, the world fleet grew by 190 percent, going from 160 million gt to 310 million gt. The Spanish merchant fleet grew at a faster pace, from two million to five million gt—a 250 percent increase—with more than 50 percent of ships being five years of age or less.

The fleet at the time was composed of 2,520 ships (4.9 million gt), of which 1,616 were fishing vessels (of more than 100 gt each), carriers and factories. The rest were dedi-

cated to transportation and auxiliary activities.

By 1974, the Spanish shipbuilding industry, with the support of domestic allied industries, had matured enough to achieve a certain degree of independence from foreign suppliers.

With the exception of the production of propulsion engines and generators, which were manufactured under license, all the ships that were being built in Spain had 100 percent Spanish content.

At the end of 1975, Spain was ranked fourth in ship deliveries, after Japan, the Federal Republic of Germany, and Sweden.

The new year, however, saw a 26 percent decline in order book demands, as well as ship cancellations and delivery refusals as a consequence of the oil crisis. Additionally, the burden of the political and social transition to democracy, as well as its incorporation into the European Community (EC), weighed heavily upon Spain.

The world fleet at that time was more than 60 million deadweight tons (DWT). Spain's merchant fleet stood at 5.6 million gt at end-1975, and grew to 8.5 million gt by 1978.

The principal countries on the international maritime scene began to adopt emergency measures to help their merchant fleets and respective shipbuilding industries. Direct subsidies for new shipbuilding ranged between 15 to 35 percent in some countries, while others extended lines of credit to shipowners to finance vessel construction.

In the meantime, shipbuilding in Spain in 1978 fell by 45 percent, with export ship sales dropping by 75 percent. To counteract this trend, the National Institute of Industry (INI) took over the major shipyards and their affiliates, with 80 percent of the country's shipbuilding capacity falling under government control.

Furthermore, the Spanish fleet, although modern, still remained uncompetitive in the international market due to higher operational costs. The government also retained control over all Spanish-flag ships. Compounding the situation, because of enormous industry debt, restrictions were placed on new loans to the maritime sector and new sources of investment were hard to find.

By 1982, the government began to institute plans to speed the recovery of the shipbuilding and maritime sectors, as well as to reorganize the legal and functional systems regulating ports.

An analysis revealed the principal causes burdening the national fleet were: (1) the prohibition of the importation of new ships under the Spanish flag; (2) increased operating costs caused by outdated admin-

Ship repair in Las Palmas

ORDER BOOK SHOWING PRINCIPAL TYPES
1975, 1981, 1986, 1991

	1975		1981		1986		1991	
Type of Vessel	No. of Ships	GT	No. of Ships	GT	No. of Ships	GT	No. of Ships	GT
Combined Carriers	0	0	6	264,000	0	0	0	0
Bulk Carriers	24	325,218	27	678,369	6	155,421	0	0
Container / RO/RO	34	91,053	34	153,148	5	35,550	0	0
General Cargo	77	533,113	33	152,305	5	21,363	3	9,895
Oil Tankers	33	3,401,624	4	196,400	0	0	14	680,874
LPG / LNG	11	26,800	16	156,535	9	60,125	1	3,560
Passenger Ships	2	20,535	2	14,800	2	1 257	6	83,482
Fishing Vessels	236	145,020	81	46,559	113	64 065	59	138,621
All Other Types	33	16,655	31	24,236	5	7 495	18	9,473
TOTAL	450	4,560,018	234	1,686,352	145	345 276	101	925,905

Source: GSN (Spain)

istrative and legal structures regulating the maritime sector; (3) lack of financing and extremely high structural costs in the shipping industry.

By 1984, after repeated pleas from ANAVE and CONSTRUNAVES, the reconversion of the shipbuilding sector began with the formation of two entities by Royal Decree—the Gerencia del Sector Naval (GSN), a technical secretary and dependent on the Ministry of Industry, with the function of controlling and overseeing the management for the Subsector of Large Public Shipyard Reconversion Plans; and PYMAR (small and medium-size shipyards in reconversion), to handle the coordination and administration of business plans.

That same year, the government signed the Treaty of Adhesion to the European Communities which would produce Spain's entry into the EC in January 1986. This event forced compliance with all the reforms demanded by the EC, among them, those affecting the shipbuilding sector and maritime industry.

The situation was compounded by the decision on the part of the Banco de Credito Industrial to exercise its rights over bad loans made to shipowners. A subsidiary of Banco de Credito Industrial was formed called La Sociedad de Gestion de Buques, which amassed all the ships under one entity and converted its holding into the largest "shipping company" fleet in Spain.

This enormous distortion of the Spanish fleet had a negative impact on shipowners.

At this point, practically all existing lines of credit for financing new ships were closed. With the domestic market in decline, the only option left to Spanish shipbuilders was the export market. But shipyards were faced with the obstacle of winning new markets at a time when the demand for new ships was extremely low. By 1986, Spanish shipbuilding reached its lowest point in modern history with an output of 176,000 gt. Total employment in the sector dropped from 40,400 in 1984 to 23,500 in 1987. The reduction in shipbuilding production capacity for the entire sector was set at a ceiling of 445,000 cgt.

Only the vital fishing sector produced a relatively high enough demand to keep the smaller shipyards working. Of the 74 ships delivered in 1986, 50 were fishing vessels, accounting for 32,000 gt.

Prinsesse Ragnhild

DELIVERIES SHOWING PRINCIPAL TYPES
1975, 1981, 1986, 1991

	1975		1981		1986		1991	
Type of Vessel	No. of Ships	GT	No. of Ships	GT	No. of Ships	GT	No. of Ships	GT
Combined Carriers	2	129,000	0	0	0	0	0	0
Bulk Carriers	18	329,104	7	136,364	3	51,044	1	2,169
Container / RO/RO	5	6,181	17	53,016	3	16,638	0	0
General Cargo	19	91,358	21	78,111	8	76,273	9	60,570
Oil Tankers	8	1,025,569	3	127,435	0	0	8	322,755
LPG / LNG	3	8,770	5	85,057	3	1,689	2	8,500
Passenger Ships	6	19,781	2	3,867	1	105	2	374
Fishing Vessels	141	72,700	14	4,310	50	25,775	51	48,134
All Other Types	22	7,603	16	14,829	6	4,092	2	354
TOTAL	224	1,690,066	85	502,989	74	175,616	75	442,856

Source: GSN (Spain)

While 1987 was a crucial year for the recovery in the Spanish shipbuilding industry, the problems of the merchant fleet continued unsolved. The fleet steadily declined and shipping companies were at a clear competitive disadvantage compared to their European counterparts. The National Fleet Plan did not alleviate the situation, confirming the doubts voiced at the time of its introduction.

Although the indispensable new law governing the merchant marine still remained theoretical, even more urgent was the introduction of a new ship register which would allow domestic shipping companies to compete in terms of operational costs with the rest of the EC. This register is patently necessary as can be seen in the graphs and tables concerning the evolution, not only in the shipbuilding industry, but also the maritime transport sector spanning the years 1987-1992.

Shipbuilding Sector Increases Market Share

The sixth EC directive provided a transitionary period for Spain. The directive outlines a differential aid plan for reconversion in respect to the EC members that had already undergone such a process.

The shipbuilding industry demonstrated to the international market that it was once again a leader, at the forefront of competitiveness. The industry recovered its market share in a relatively short period (1987-89), with impressive commercial aggressiveness.

From September 1987 to December 1989 alone, the Spanish shipbuilding order book jumped from 247,111 gt to 815,755 gt, without any significant domestic demand. The country's world market share increased from 1.6 to 3.3 percent, while obtaining important foreign clients and improving overall onboard technology.

With this final part of the shipbuilding reconversion, productivity levels reached two and one-half times those prior to 1987.

Allied industries reemerged, new goals were set in research and development for the use of different application of CAD/CAM and the incorporation of antipollution technology.

In contrast, the Spanish fleet continued declining. Approximately 500,000 gt was lost per year during 1988 and 1989, leaving the fleet below 1971 levels of 3.1 million gt.

In 1991, Spanish foreign trade generated $159 billion and for the first quarter of 1992, this figure stood at $42 billion, projecting to $166 billion over the entire year.

The commercial deficit for 1991 was $34.4 billion. For the first five months of 1992, this figure grew by $16 billion. It is evident that the Spanish economy urgently needs to improve its export volume in order to control its commercial deficit.

Maritime commerce was 161 million tons for 1991 (see corresponding table). Maritime trade occupied, in terms of value, 86 percent of all imports and 68 percent of all exports. Close to 90 percent of all foreign trade belongs to the maritime sector in terms of tonnage. Spanish shipping companies, however, participate in only 30 percent of this market.

Luis de la Pena, ANAVE president, has stated that this figure is unsatisfactory. He is in favor of the renovation and modernization of the sector, as well as improving the productivity and market share of the Spanish transport fleet.

In February of this year, initial steps were taken by the Spanish Parliament to enact the long-awaited Ley de Puertos y la Marina

ORDER BOOK: 1981-1991
(Gross Tonnage)

Year	Domestic	Export	TOTAL
1981	338,564	1,347,788	1,686,352
1982	239,609	1,042,653	1,282,262
1983	176,315	745,843	922,158
1984	221,549	264,366	485,915
1985	181,647	263,294	444,941
1986	147,521	197,755	345,276
1987	183,224	291,569	474,793
1988	270,532	545,223	815,755
1989	253,785	1,060,487	1,314,272
1990	164,294	1,053,143	1,217,437
1991	42,262	883,643	925,905

Source: GSN (Spain)

Mercante, a law concerning ports and the merchant marine, as well as the preliminary plan for the law concerning the creation of a second register for Spanish ships.

Present director of the Merchant Marine, **Rafael Lobeto**, hopes that this law will be passed by the end of this month, in order to provide the desired framework not only to carry out the plans for modernization of the port authority and the maritime sector, but also to update the Spanish fleet.

DELIVERIES: 1981-1991
(Gross Tonnage)

Year	Domestic	Export	TOTAL
1981	322,287	180,702	502,989
1982	183,632	302,051	485,683
1983	128,695	363,401	492,096
1984	94,064	351,556	445,620
1985	76,473	166,653	243,126
1986	98,539	77,077	175,616
1987	97,312	167,285	264,597
1988	116,167	24,193	140,360
1989	51,857	183,154	235,011
1990	128,335	243,035	371,370
1991	111,055	331,801	442,856

Source: GSN (Spain)

In spite of the great number of ports distributed along the more than 3,700 miles of Spain's coast, only a few are significantly dedicated to commercial activities; 19 ports control 92 percent of the market.

In 1990, port activity contributed more than $2.3 billion to the Gross Domestic Product, with a growth in total movement reaching 248 million tons.

The new port authority structure, according to Mr. **Lobeto**, will be one of the most modern and well conceived in Europe. This opinion is held in consensus by those who have had the opportunity to study

FISHING FLEET SHOWING PRINCIPAL TYPES
(July 1991)

Type of Vessel	No. Ships	GT
Trawlers	2,825	430,944
Seiners	1,324	113,820
Liners	4,517	86,992
Gill Netters	5,760	22,199
Multipurpose Vessels	3,491	13,138
Other Fishing Vessels	1,960	4,757
TOTAL	19,877	671,850

Including all classes of vessels.
Source: SGP (Spain)

in depth the contents of the new law.

As for the second registry of ships, more commonly known as the "Registro Canario," this will augment Spanish crews and at the same time increase shipping companies' competitiveness in national and international traffic.

Fishing Industry Of Vital Importance

The building and outfitting of ships, the number and size of fishing companies, and the extensive consumption of fish products make Spain's fishing industry an economic sector of vital importance. Spain's foreign trade in fish, for 1990, earned more than $3.15 billion, from a total of 1.18 million tons of catch.

The Spanish fishing fleet is the fourth largest behind the Soviet Union, Japan and the United States, comprising 1,664 ships of more than 100 gt. Nevertheless, including all the ships of less than 100 gt, the fleet would then jump to about 20,000 vessels totaling 700,000 gt, employing close to 90,000 sailors.

The mean average of the catch over the past few years has been about 1.5 million tons per annum. It should be noted that a large percentage of the catch is made up of fish which is highly valued by consumers: hake, cod, tuna, sole, whiting, sardines and shellfish.

Spain's principal fishing ports include: Vigo and La Coruna in the northwestern province of Galicia; Huelva and Cadiz on the Atlantic southwest; Algeciras on the Mediterranean southeast; Las Palmas in the Canary Islands; Pasajes and Santander on the northern coast; and Bermeo and Fuenterrabia on the Bay of Biscay.

The shipbuilding industry serving the fishing sector is also well developed, taking into account the cyclical demand for new vessels. The annual capacity of the shipyards serving this sector ranges from 50 to 120 steel-hulled vessels per year depending on demand, varying in size from less than 30 meters to as long as 100 meters.

The principal builders serving this sector include: H.J. Barreras, P. Freire, Santodomingo, Vulcano, Astilleros de Huelva, Armon, Gondan, and Naval Gijon.

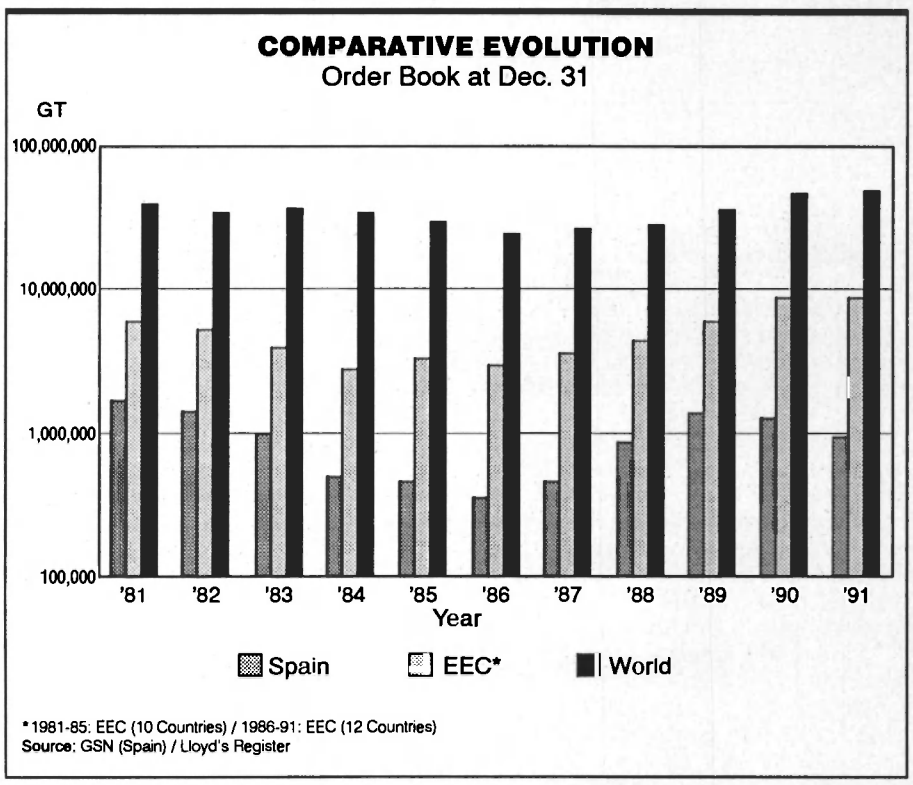
Rodman-Polyships is building a large number of ships and fishing barges.

The company is taking a leading role in applying new technologies such as the construction of up to 40-meter ships with hulls made of polyester reinforced with fiberglass. Since its founding in 1986, the company has built close to 100 fishing boats and other craft.

The company's installations as well as its production capacity make it one of the most advanced in all of Europe dedicated to the use of polyester reinforced with fiberglass.

Rodman-Polyships is also active in the building of patrol boats for the Navy and ship repair.

Pescanova, one of the most important companies involved in deepsea fishing and the commercializing of its products, is adding several polyester/fiberglass reinforced boats built by Rodman-Polyships at its facilities in Vigo.



*1981-85: EEC (10 Countries) / 1986-91: EEC (12 Countries)
Source: GSN (Spain) / Lloyd's Register

MARINE DIESEL ENGINE DELIVERIES 1991
(Four-stroke Propulsion Engines >500 BHP)

Shipbuilder	No. Engines	% of Total Engines	No. BHP	% of Total BHP
Guascor	188	55	96,300	18
Bazan – MAN B&W				
Bazan – MTU	52	15	64,200	12
Echevarria – Wartsila	34	10	187,250	35
Deutz	34	10	26,750	5
Others	34	10	160,500	30
TOTAL	342	100	535,000	100

Source: Own design

Shipbuilding

The Spanish shipbuilding industry has been represented in the EC and in other various European associations by UNINAVE, since its inception in 1988.

GSN has the responsibility of overseeing the compliance with EC directives. Since its creation, the GSN has played a very important role in correcting misguided tendencies and industrial policies, as well as pushing for sorely needed modernization in this sector.

Jose Luis Cerezo, the general secretary of GSN, is actively promoting modernization in the shipbuilding sector. Since he was named to the post, Mr. **Cerezo** has provided the mechanisms of incentives for improving—commercial promotion techniques, purchasing and supply management, and quality control to the lesser developed shipbuilding companies. He believes that Spain has the capacity to be in the forefront of the industry within Europe.

Not until the end of 1992 will Spain assume the presidency of Committee of European Community Shipbuilders Associations (CESA) in the person of **Juan Saez**. Mr. **Saez** is the president of Astilleros Espanoles and vice president of UNINAVE.

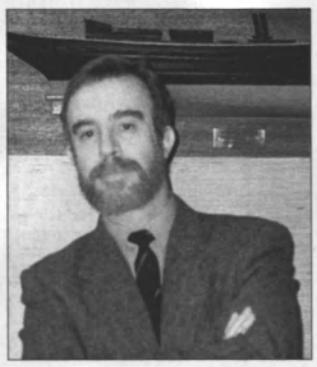
Although the sixth EC directive did not put a ceiling on the amount of aid allowed by Spain to its shipbuilders, according to UNINAVE general director **Jose E. Perez** in his annual report, Spanish shipyards have not received significant differential subsidies.

AESA – MANISES
MARINE DIESEL ENGINES
(Two-stroke Propulsion Engines)

	No. Engines	No. BHP
DELIVERIES		
(Jan. 1, 1992)	10	230,000
of which, stationary	3	90,000
ORDERBOOK		
(Jan. 1, 1992)	17	450,000
(July 1, 1992)	12	381,000
of which, stationary	4	208,000

Source: Astilleros Españoles (AESA)

Active work is being done on projects such as the new E-3 (Environmental, Economical and European) oil tanker—Astilleros Espanoles is playing a significant role in its development. Additionally, other companies are occupied with various projects.



Jose Esteban Perez

—Union Naval de Levante, for example, is consolidating its position within the international market for passenger ship construction.

—Construnaves is now focused on technical and commercial activities and is relaunching the private shipbuilding sector.

—Bazan is implementing drastic restructuring in its military division due to a decrease in international demand and a cut in military plans. Military spending plans have slipped from $450 million to $350 million for the period covering 1993-97. Bazan is currently building an amphibious ship, four minesweepers and a logistics shuttle ship.

The sector in general is much in need of a reactivation coming from the national market and an improved framework of competitiveness which would allow for the consolidation of possible export markets.

Ship Repair Keeps Yards Busy

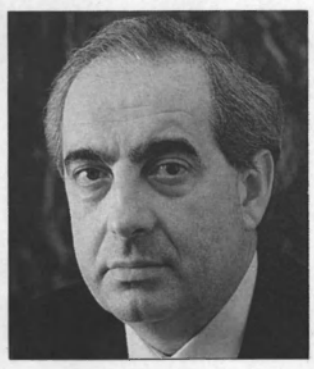
Concerning the market for repairs and conversions, Spain's capacities in these areas is very important. The facilities of Astilleros Espanoles along with Astano and Union de Levante are leaders in these areas on the peninsula, as is Astican in Las Palmas in the Canaries.

Luis de la Pena

The conversion of the Prinsesse Ragnhild, incorporating a new midbody of 33.3 meters to increase its passenger capacity by 1,000, was done in astonishingly short time at AESA's shipyard in Cadiz. This conversion, in terms of size and dimensions, places it among the most sophisticated in the world.

Astilleros Espanoles data reveals that the shipbuilders repaired 190 vessels totaling 3.4 million gt during 1991. As of May 1992, AESA facilities had repaired 86 vessels totaling 1.2 million gt.

By May of this year, Astican had repaired 112 ships, 28 of which were Spanish owned. Notable jobs using the company's Syncrolift included work on the American-flag Galveston Bay of Afram Lines; the Japanese ship Clipper Pioneer of Nanyo Corporation; and the C.I.S. ship Velizh of the Baltic Shipping Company. All the vessels had extensive steel work performed.



Juan Saez

The high quality work as well as the versatility of Astican's installations places it among the top in the world.

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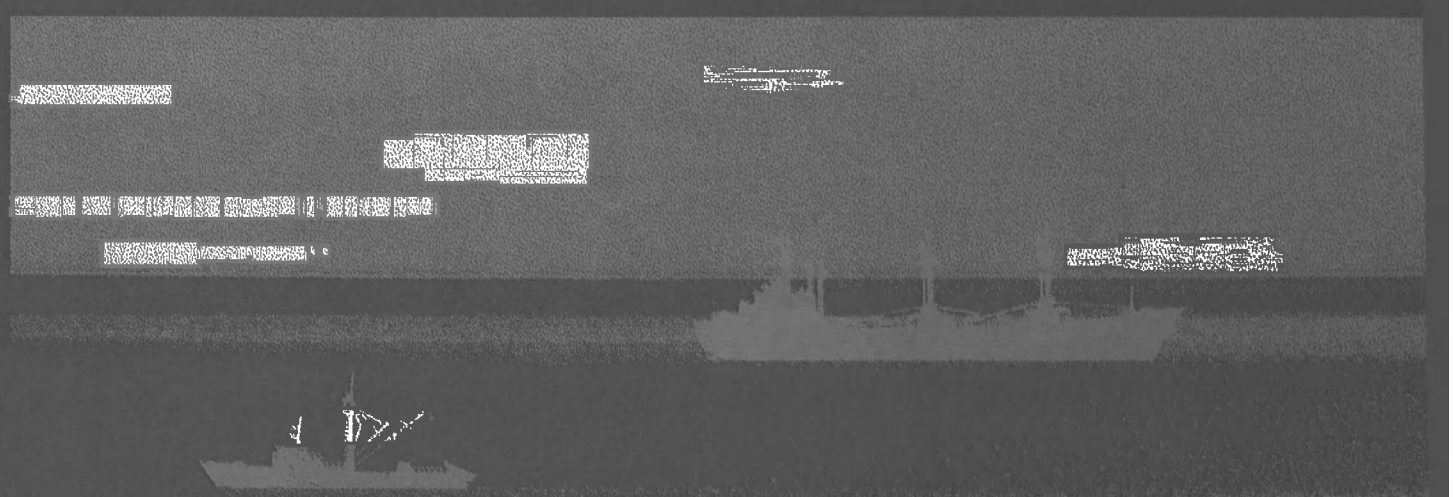

- Over 30 years in the international shipbuilding market.
- With exports to more than 60 countries.
- All types of both small and medium ships and the most comprehensive offer in fishing vessels.
- Over 580 ships delivered over the past 9 years.

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Who has the best offer on all medium and small range ships?
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Government-controlled Bazan also has repair and conversion capacity. For medium-size ships, the firm has a Syncrolift at its disposal at its facility in Cartagena.

There is a high level of ship repair activity at the Union Naval de Levante Barcelona shipyard.

Largest FSU Under Construction

The Spanish shipbuilding industry is also active in the offshore sector. Astano, which belongs to the Astilleros Espanoles Group, is finishing the Production Testing and Storage Unit PTS-850-C for delivery to the Norwegian companies Ocean Production and Smedvig. This unit will be the biggest of its type with a storage capacity of 86,500 cubic meters.

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Spanish Diesel Manufacturers

Within the subsector of major suppliers of ship equipment, the Spanish shipbuilding industry is a remarkable force in the building of propulsion and auxiliary engines, enjoying a notable range of slow-, medium- and high-speed engines.

In the range of slow-speed diesel engines, Astilleros Espanoles Factoria de Manises, located in Valencia, is dedicated to the manufacture of two-stroke diesel engines for ships, as well as for electrical power plants, producing a complete top range of AESA-Sulzer and AESA-Man B&W models. The Manises factory's annual capacity on the test bench is 400,000 bhp. Manises is the only producer in Spain of two-stroke diesel engines and one of the most important in Europe.

There are three producers of medium- and high-speed four-stroke engines, with greater than 500 bhp. They are Bazan-Cartagena, Echevarria-Wartsila, and Guascor.

The modern facilities of Bazan-Cartagena specialize in the manufacture of medium- and high-speed diesel engines, the medium-speed range being Bazan-MAN B&W engines and the high-speed range Bazan-MTU. Bazan-Cartagena is one of the many parts of the government-run Bazan shipbuilding company.

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Finally, Guascor, also privately held, must be mentioned not only for its lead in the number of engines produced in 1991, but also for being the only one of the three enterprises that entirely produces its own engines using its own design and technology. It produces engines ranging in power from less than 200 bhp to a maximum of 1,350 bhp.

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PRIVATE UNDER PYMAR CONTROL						
UNL	7	75,342	2	1,160	0	0
E. Lorenzo	9	44,956	0	0	2	15,610
Naval Gijon	5	39,025	0	0	1	7,805
C.N. Santodomingo	8	7,348	2	998	0	0
A. Huela	6	7,147	0	0	3	6,327
ARN	1	6,775	0	0	1	3,560
A. Zamacona	19	6,682	0	0	2	638
A. Murueta	2	4,247	0	0	0	0
C.N.P. Freire	4	1,804	2	405	0	0
A. Ardeag	5	1,403	0	0	1	257
A. Armon	7	1,401	4	685	4	802
A. Sicar	1	1,113	0	0	0	0
F.N. Marin	1	290	0	0	0	0
A. Mallorca	1	218	0	0	0	0
A.Y.T. Ferrolanos	1	208	0	0	1	255
A. Atlantico	0	0	0	0	0	0
A. Gondan	0	0	0	0	1	937
A. Luzuriaga	0	0	0	0	0	0
A. Ojeda Y Aniceto	0	0	0	0	0	0
A.Y.V. Tarragona	0	0	0	0	0	0
Balenciaga	0	0	0	0	0	0
Total	77	197,959	10	3,248	16	36,191
OTHER PRIVATE YARDS						
A.J. Valina	3	1,657	0	0	0	0
A. Orge Leiro Barros	0	0	0	0	0	0
C.N. Del Sureste	0	0	0	0	0	0
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Repsol-Naviera Vizcaina, S.A.	6		317,371	
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Naviera Mallorquina, S.A.	4		4,330	
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Naviera Del Golfo De Vizcaya, S.A.	2		136,544	
Temasa	1		7,374	
Total	75	29.2	1,423,900	55.2
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Total	182	70.8	1,155,694	44.8
TOTAL	257	100.0	2,579,594	100.0

Bullock Named Senior VP, Exploration And Production

lock worked as an independent petroleum consultant for several major exploration companies, focusing primarily on international projects.

Mr. **Bullock** served as general manager-production, president, chief operating officer and director of Superior Oil International in

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dustrial sectors are presently going through a difficult period. This is largely due to severe economic adjustments, fruits of the Maastricht Accord, required of Spain in compliance with its full economic incorporation into the EC. Another important factor to take into consideration is the general international climate of economic decline.

Some of the harder hit areas, such as iron ore/coal mining, and steel and iron production demand far-reaching reforms and restructuring.

In other sectors, the government's policy is the privatization of industries under its control. This is being done to promote free competition. The maritime industry appears to be headed in this direction as well.

The many enterprises within the maritime sector will also need to implement changes. And these changes are faced with the old battle of tradition vs. modernization.

Hierarchical company structures must change to be more functional. High level management must institute a new methodology for conducting business. The financial engineering formula for improving liability on new contracts must also be addressed. Spain's giant private banking sector should become more sympathetic on this point instead of just ignoring it.

Regardless of these negative aspects, shipyard productivity and use of modern technology have propelled the shipbuilding sector into the forefront of the industry.

With full incorporation into the EC imminent, Spain will have to place more emphasis on it maritime industry if it expects to be able to fully compete with the rest of the member countries.

Envirovac Announces Key Appointments

Phil Nafziger

Morris Bateman

Frank Eubank , president of Envirovac Inc., a Rockford, Ill., a leading manufacturer of vacuum systems for the marine industry, recently announced three key company appointments.

Phil Nafziger has been named vice president of marine systems with overall responsibility of this business area. **Morris Bateman** has been appointed as sales manager reporting Mr. **Nafziger**.

Roland Consie has been named as vice president of engineering of Envirovac Inc. and **Ken Weyers** has been named as manager of marine, train, and commercial building engineering, reporting to Mr. **Consie**.

Ed Wildrick has been named as vice president of customer support of Envirovac Inc.

Envirovac has supplied EVAC vacuum systems which are now installed on over 3,000 commercial and military vessels worldwide. U.S. military vessels include the DDG 963 Class, DDG 51 Class, MHC 51 Class, T-AO-187 to 204 Class, T-AGOS-19 to -22 Class, T-ARC-7 Class, T-AGOR and T-AGS-45 Class. Envirovac has supplied the U.S. Coast Guard, Navy and commercial marine industry with over 360 vacuum systems since 1974.

Bullock Named Senior VP, Exploration And Production For Coastal Corporation

In an announcement made by the Coastal Corporation, **Jerry D. Bullock** was recently elected senior vice president, exploration and production.

Before joining Coastal, Mr. **Bullock** worked as an independent petroleum consultant for several major exploration companies, focusing primarily on international projects.

From 1987 to 1990, Mr. **Bullock** was an executive vice president with British Petroleum's BP Exploration Company.

From 1985 to 1987 he served as senior vice president, production for Sohio Petroleum Company, with responsibility for drilling and production activities in North America.

Mr. **Bullock** served as general manager-production, president, chief operating officer and director of Superior Oil International in Houston from 1981 to 1985.

Prior to 1981 he worked for Exxon, completing his career in Houston as headquarters operations manager.

The Coastal Corporation is a Houston-based energy holding company. The company has assets of $9.4 billion and subsidiary operations in natural gas transmission and storage, refining and marketing, oil and gas exploration and production, coal, chemicals, trucking and independent power production.

McDermott Completes Phase One Of Shell Auger Pipeline Project

McDermott Marine Construction recently announced that it has completed the installation of about 52 miles of 12-inch oil pipeline and 16 miles of 12-inch gas pipeline for phase one of the Shell Auger pipeline project.

The two pipelines will eventually connect the Shell Auger tension leg platform (TLP) at Garden Banks Block 426 with two shallow water production platforms located in the Vermillion and Eugene Island areas of the Gulf of Mexico.

Pipelaying operations began in May of 1992 and were completed about one week ahead of schedule. The pipelines were laid by McDermott's Derrick Barge 28 using conventional pipelaying methods in water depths ranging from 243 to 1,240 feet.

Phase two will extend the previously laid pipelines another 20 miles to the Auger platform. Water depths will range from 1,240 to 2,860 feet and the work will be performed by McDermott's Derrick Barge 50 using the J-lay method.

McDermott Marine Construction is a major operating unit of McDermott International, Inc., a leading worldwide energy services company. The company and its subsidiaries provide engineering and construction services to the oil and gas industry offshore and for industrial and utility facilities onshore. McDermott also manufactures steam-generating equipment, environmental equipment, defense and aerospace products, and designs, and builds ships for a wide variety of services.

For further information about McDermott International, Inc.,

Circle 48 on Reader Service Card

Oceaneering To Spend $4 Million To Upgrade ROV Fleet

Oceaneering International, Inc., has announced that it plans to spend $4 million to refurbish and upgrade its fleet of remotely operated vehicles (ROVs) around the world.

Most of the large work vehicles in Oceaneering's fleet are expected to be upgraded to higher horsepower and outfitted with new video systems to improve handling, work capabilities and video communications from the seabed to the surface. The umbilicals on several of the systems are to be upgraded to include fiber optics as well as the standard electromechanical elements.

Oceaneering, together with its affiliate companies, is one of the world's largest underwater services companies.

CAE Electronics To Develop Advanced Engine Control Module

CAE Electronics Ltd., Montreal, has been selected by Westinghouse Marine Division to develop and supply a digital engine controller for the intercooled recuperative (ICR) engine program for the U.S. Naval Sea Systems Command.

Westinghouse has teamed with Rolls-Royce and CAE to provide an ICR engine which will offer considerable fuel savings, increased power margin, reduced life cycle cost, and a lower air-borne and structure-borne noise.

The value of the CAE contract is about $10 million for the advanced development phase. This contract represents an expansion of CAE's considerable engine control module proven experience on such programs as the Canadian Patrol Frigate, Trump and the SA'AR 5.

CAE Electronics Ltd. is a subsidiary of CAE Industries Ltd., Toronto, a world leader in simulation and training systems and services for commercial and military customers throughout the world.

For further information,

Circle 76 on Reader Service Card

Conrad Industries Announces New Additions To Its Staff

Conrad Industries, Inc., based in Morgan City, La. recently announced new staff positions within its management team. According to general manager, **Ronnie Chiasson**, "The recent additions in management positions reaffirm Conrad's commitment to the long term success and growth of the shipyard."

Eddie Knope was named marketing director and his responsibilities will include sales and development of domestic and international markets for new construction and boat/barge repair services. Mr. **Knope** previously worked for Seahorse, Inc. and brings 20 years of experience in sales, administration and management in marine fabrication and transportation.

David Williamson has 16 years of experience in personnel and safety in the boat and barge industries. Mr. **Williamson** was named safety director and his responsibilities will include the development and administration of the company's safety and health programs.

Mr. **Knope** and Mr. **Williamson** both join a management team which includes: president **J. Parker Conrad**; general manager **Ronnie Chiasson**; project managers **Norman Breaux** and **James McElroy**; yard superintendent **Herman Bailey;** and superintendent of new construction **Curtis Wiggins**.

Conrad Industries specializes in boat/barge repair and new construction.

For further information about Conrad Industries capabilities,

Circle 7 on Reader Service Card

Canadian Coast Guard To Finance Dredging Of St. Lawrence At Montreal

An agreement was recently signed by the Port of Montreal and the Canadian Coast Guard for the financing of a dredging project which would deepen the navigable depth of the channel by one foot. The present depth of the river at the Port of Montreal is 35 feet. The project is expected to be completed by the end of October.

According to an official at the port, the added foot would allow containerships with capacities of 2,100 TEUs to 2,500 TEUs to enter the port as compared to the present maximum sized 1,800 TEU vessels that the Canadian port can presently handle.

The channel is to be deepened between Montreal and Quebec City with the Port of Montreal being the financing most of the project because it is at the upstream end of the channel. About $1 million will be spent by the Port of Montreal on the project.

Runyan Shipyard Acquires Former Runyan Machine And Boiler Works

Sheldon B. Guren, chairman of a group of companies which includes Admiral Towing and Barge Company and The Great Lakes Towing Company, has announced the acquisition of the assets of the former Runyan Machine and Boiler Works, Inc. by Runyan Shipyard, Inc., of Pensacola, Fla.

The new Runyan complex consists of machine shops, welding and fabrication, electrical repair, sandblasting and painting, engine overhaul and rebuilding capabilities, as well as three marine railways. Also to be known as "Runship", the new facility is expected to expand Runyan's ship repair and machine shop businesses to include new vessel and barge construction, and a new marine industrial park for various specialized repair businesses which support the Navy in Pensacola.

One of the considerations for the purchase of the former Runyan Machine and Boiler Works facility was reported to be the Navy's indication of a need and their willingness to support a local repair facility. The shipyard was recently awarded a $1.5 million contract for the drydocking and repair of the USS Taurus (PHM-3), a Navy hydrofoil homeported in Key West.

Admiral Towing and Barge operates six tugboats on long-term contract to the Navy providing towing assistance to naval vessels and yard craft at the Naval Air Station in Pensacola. Admiral also has tugs operating under charter to the Navy in South Carolina.

The Great Lakes Towing Company, Cleveland, Ohio, owns 50 tugboats and has been in business for more than 93 years. The company also owns and operates a shipyard and drydock in Cleveland, which performs ship repair, machine shop and fabrication similar to what is performed by Runyan.

For more information detailing the services and facilities offered by Runyan Shipyard,

Circle 149 on Reader Service Card

Massachusetts Maritime Receives $50,000 Grant From Mobil Oil Shipping

Massachusetts Maritime Academy recently received a $50,000 grant from Mobil Oil Shipping, a division of Mobil Corp. The money will be used to support the school's new major in marine safety and environmental protection. According to the academy, the new field of study will give oil and shipping companies a way to meet the requirements of OPA 90.

The money received from Mobil is reported to be the largest corporate grant that the academy has ever received.

Massachusetts Maritime has also received about $650,000 in state and federal grants to fund its new Marine Environmental Protection training center. The money will help the academy purchase what is reported to be the only marine oil spill management simulator and a liquid cargo handling simulator in the United States.

Nautronix Offshore Appoints Representatives In Brazil And Mexico

Nautronix Offshore of Houston, Texas, has announced the assignment of representatives for Mexico and Brazil.

According to **Duke Miller**, director of marketing, the company appointed Ocean Electronics and Seamar Representacoes Ltda. as representatives for Mexico and Brazil respectively.

Nautronix Offshore is internationally recognized as one of the leaders in the development of acoustic and vessel dynamic positioning systems.

For more information on the equipment and services offered by Nautronix,

Circle 55 on Reader Service Card

MARINE PROPULSION

Latest Developments From The World's Leading Manufacturers

Long a dominant force in the marine power market, MAN B&W Diesel, one of the world's largest manufacturers of slow- and medium-speed diesels, has been particularly successful in recent years in the containership propulsion market.

In the U.S., for instance, the recently constructed Matson Navigation boxship Pfeiffer features a MAN B&W 8180MC slow-speed diesel, with a rating of 33,680 bhp at 88 rpm. Prior to the Pfeiffer installation, MAN B&W Diesel engines were fitted on the last three containerships built in the U.S. at Bay Shipbuilding.

Five post-Panamax boxships being built by Hyundai Heavy Industries in South Korea for Hyundai Merchant Marine will be powered by some of the most powerful marine diesels ever ordered. Each 4,000-TEU-plus vessel will be feature an MAN B&W 12-cylinder K90MC-C engine offering a maximum output of 70,320 bhp at 104 rpm. The 900-mm bore/2,300-mm stroke K90MC-C design is tailored to the demands of large new generation boxships which require speeds in excess of 25 knots.

Other recent installations: a series of eight Hapag-Lloyd 4,400-TEU containerships built at Samsung Shipbuilding, and another 4,400-TEU boxship built by HHI for MISC.

Also part of the MAN Group, MAN B&W Holeby offers the 23 and 28 Series gensets. Covering a power range of 500 to 4,000 kW, the five-to 18-cylinder models operate on economical heavy fuel oil, have excellent overhaul intervals and unlimited low-load/no-load operation, while still conforming with environmental emission requirements.

Japanese manufacturer Mitsubishi Heavy Industries (MHI) recently introduced a long-stroke version 240-mm bore six-cylinder engine to its medium-speed diesel engine SU series. The in-line six-cylinder S6U2 engine has a stroke of 300 mm, increased from the 240 mm stroke of previous SU engines.

MHI reports that fuel consumption has been improved by optimizing turbocharger performance and inlet and exhaust valve timings; and NO_x emissions—whose reduction is critical in light of new environmental pollution regulations—have been lowered with modifications in the fuel injection system.

The SU series, introduced in the late 70s, includes two in-line models, six- and eight-cylinder versions, and two Vee configurations, 12- and 16-cylinder models. The power range covers from 750-3,680 kW (1,006-4,935 hp) at speeds ranging from 720 to 1,200 rpm.

German engine manufacturer Krupp MaK is now able to offer heavy fuel-burning in-line diesels

ranging in power from 800 to 11,000 kW (1,072-14,751 hp) to the shipbuilding industry, thanks to its recent introduction of the M 20 engine. A long-stroke design, with a bore of 200 mm and stroke of 300 mm, the M 20 has a speed range from 900 to 1,100 rpm. The diesel is available in in-line models of six, eight and nine cylinders and 12- and 16-V configurations. Series production of the in-line models is expected to begin shortly, while V configuration models will be available within the next two years.

With the M 20 engine introduction, Krupp MaK hopes to increase its reported 15 percent share of the medium-speed diesel small vessel propulsion and ship auxiliary market.

The newly launched 1,300-passenger CostaClassica and her sister, the CostaRomantica under construction at Fincantieri in Italy, each have main propulsion systems comprised of eight-cylinder Sulzer ZAL40S medium-speed engines, providing a combined output of 28,800 bhp, and four 3,660-kW gensets driven by 12-cylinder GMT A320 engines.

The first commercial icebreaking research ship under the U.S.-flag, the recently delivered Nathaniel B. Palmer, features Caterpillar propulsion. The 308-foot ship, built by North American Shipbuilding of Larose, La., is fitted with four Caterpillar 3608 diesels, rated at 3,180 bhp at 1,000 rpm, with two nozzled Ulstein stainless steel controllable-pitch four-blade propellers. Four Caterpillar 3512s, in combination with KATO generators, supply ship's power.

The newly launched class of Marine Spill Response Corporation (MSRC) vessels also feature Cat power, with twin 3512 C main engines, totaling 3,000 hp, in combination with Reintjes reduction gearing with turbo Voith couplings.

Caterpillar along with Cummins have also become the dominate choice in the hot casino boat market. For example, Cummins engines power the Alton Belle Casino and Dubuque Casino Belle, while Cat diesels provide propulsion aboard the Emerald Lady, Diamond Lady, Par-A-Dice and Empress Riverboat Casino.

However, MTU of North America made a major breakthrough into the riverboat casino market with a recent order for a total of six main propulsion, auxiliary and bow thruster engines. The MTU diesel package will be installed on the 210-foot, 1,200-passenger riverboat casino under construction at Leevac Shipyards in Jennings, La., for Southern Illinois Riverboat Casino/Player's International. Two resiliently mounted MTU 12V 183-TE62s, rated at 750 hp each at 2,000 rpm, will supply propulsion power, via ZF BW255 reverse reduction gearing, while two 720-kW 8V 396TE-54s will provide auxiliary power. A 405-hp 12V model 183AA91 diesel will supply power to the Schottel SST-170-T 400-hp bow thruster. A sixth engine, a 6R 183AA51 diesel, drives a 120-kv generator.

The gaming/passenger vessel is a natural market for its engines, MTU feels, because of the company's extensive sound- and vibration-dampening experience, particularly in the patrol boat market. Discussions for additional riverboat casino engine

For More Information On Marine Propulsion Systems

Technical data, product literature and brochures are available free of charge on any of the marine propulsion and equipment included in this article. To receive copies of free literature, circle the appropriate Reader Service number on the postpaid card bound into the back of this issue. See the table below for appropriate Reader Service number for each manufacturer.

Manufacturer	*Reader Service #*	*Manufacturer*	*Reader Service #*
ABB Stromberg Drives	87	MAN B&W Diesel	107
Alaska Diesel Electric	88	MAN B&W Holeby	108
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KaMeWa	100	Textron Lycoming	123
KATO Engineering	101	Thrustmaster of Texas,Inc	124
KHD	102	Ulstein	125
Kort Propulsion	103	Voith-Schneider	126
Krupp MaK	104	Wartsila Diesel	127
Kvaerner Masa-Yards	105	WesTech Gear Corp	128
Lister-Petter	176	Westinghouse Electric	129
Lohmann + Stolterfoht	106	ZF	130

orders are under way, according to MTU.

A well-known name on land, Deere recently launched its first two series of marine engines. Targeted at the small workboat market, the new line consists of the four-cylinder 300 Series 4039 and 4045 and the six-cylinder 400 Series 6078. The units will cover a power range of 80 to 250 hp.

A pair of 15-kW Deere generators, for instance, supply power aboard the Royal Caribbean Cruise Line passenger tender La Santa Maria.

The 750 hp, six-cylinder Lugger 617A from Alaska Diesel Electric has been installed as main power on a number of small passenger boats. One recent installation was aboard a new 82-foot, 149-passenger tour boat. The turbo-aftercooled Luggers provide excellent fuel consumption and reliability.

One of the world's largest manufacturers of air-cooled engines, KHD recently launched a new liquid-cooled diesel series. The FM 1012/1013 will cover a power range of 60 to 255 hp, providing the company with a power coverage of 13 to 10,058 hp for a variety of main and auxiliary applications in both the boatbuilding and shipbuilding markets. Models in the new series will available shortly, with the complete in production by mid-1994.

Earlier this year, Deutz MWM, a subsidiary of the KHD Group, added a 16-cylinder model to its 234Y engine series. The high-speed 1,400-hp diesel is suitable for applications aboard megayachts and commercial passenger vessels.

The most powerful engine ever offered by Swedish manufacturer Volvo Penta is targeted for the small tug, towboat and general workboat market. The TAMD 162 is a turbocharged and aftercooled in-line six-cylinder diesel, with a light-duty rating of 551 hp at 1,900 rpm, medium-duty rating of 490 hp at 1,900 rpm, and heavy-duty rating of 470 hp at 1,800 rpm.

In the naval sector, the Fairbanks Morse Engine Division of Coltec Industries has supplied the main propulsion engines and ship service engine generators to Avondale Shipyards Division, New Orleans, for installation aboard the U.S. Navy LSD-41 Class ships and Henry J. Kaiser (T-AO-187) Class fleet oilers.

The Waters (T-AGS-45), the Navy's newest oceanographic survey ship also under construction at Avondale, will be fitted with five 2,500-kW generator sets powered by EMD diesel engines. Stewart & Stevenson Services, Inc., New Orleans, recently delivered. The ship will use the five EMD 16-cylinder 645-E7 diesels at 900 rpm to drive water-to-air-cooled KATO generators in a diesel-electric propulsion system. Westinghouse Electric supplied the two propulsion motors for the plant. The Waters will be commissioned early next year.

Through its agreement with New Sulzer Diesel Ltd., Westinghouse Marine Division will offer low- and medium-speed diesel engines for the U.S. Navy's Strategic Sealift Ship Construction Program.

Westinghouse Marine will supply RTA type slow-speed diesels, which range in power up to 62,400 bhp, with engine ranges between 54 to 196 rpm. More than 1,200 Sulzer RTA diesels are currently in service around the world in commercial and naval vessel propulsion applications.

Also available from Westinghouse will be the Sulzer ZA40S medium-speed engine, which generates up to 19,000 bhp. The ZA40S offers high power concentration and minimum space requirements, allowing for engineering flexibility.

Isotta Fraschini and Voith-Schneider continue to remain the propulsion system of choice for the U.S. Navy's MHC coastal minehunter class, under construction at Intermarine USA in Savannah, Ga., and Avondale Shipyards Division. The 188-foot GRP-hulled vessels are powered by a combination of two Isotta Fraschini AM ID36 amagnetic diesel engines, rated at 800 hp each at 1,800 rpm, and two Voith-Schneider cycloidal propellers, which provide the MHC with 360-degree maneuverability.

Propulsion for the U.S. Navy's new 170-foot Cyclone Class Coastal Patrol Boat (PBC) will be supplied by Paxman Valenta 16RP200CM engines. Each Bollinger-built PBC will be fitted with four units.

For use in conventional submarines, offshore oil exploration and deep-water research applications, the closed cycle system (CCS) conditions exhaust gases from diesel engines down to a water depth of 3,000 meters while maintaining the prime movers' efficiency. WesTech Gear Corp. which holds the exclusive U.S. licensing agreement with Cosworth Deep Sea Systems, Ltd., to market, manufacture, install and service the system, reports that the CCS allows for the first time a diesel to provide both significant underwater power generation and propulsion.

GE Electric Transportation Systems offers two lines of diesels, the GE FDM and Alco 251. For direct drive marine propulsion the GE FDM 12 produces 3,000 hp and the GE FDM 16 produces 4,000 hp, both at 1,050 rpm. The GE Alco 251 is available in six-, eight-, 12-, 16- and 18-cylinder versions at rotational speeds from 750 to 1,200 rpm, and power from 703 to 3,725 hp.

Dorman Diesels Ltd. recently launched 12- and 16-cylinder V-form Sea King models. The new V-form engines compliment the manufacturers' range of in-line marine diesel engines, which were launched in 1984. The Sea King marine diesel power range is 300 to 1,970 bhp.

Finally, Lister-Petter, which manufactures air- and water-cooled industrial diesel and natural gas engines, was recently selected by Iveco Aifo as its master distributor in the U.S. for its marine diesel engines up to 1,200 hp.

Diesel-Electric Propulsion

AC propulsion and power plants from ABB Stromberg Drives have been installed on a number of cruise liners. They include CCL's 70,000-grt Fantasy, Ecstasy, Sensation, Fascination and Imagination, each with two 14-MW propulsion drives, the Crystal Harmony, with two 12-MW propulsion drives, operated by Crystal Cruises, and the Statendam, Maasdam and Noordam, with 12-MW units, for Holland America Line. These nine orders have established AC propulsion as viable in commercial shipping.

The Industrial Systems Division of Siemens Electric Ltd. supplied the integrated electric propulsion system for two 300-passenger/85-vehicle ferries for British Columbia. The power plant consists of three brushless 1,700-kW Bergen Diesel gensets. The 4.16 kv supplied by the gensets is distributed by a Siemens medium voltage switchboard to four 900-kW Siemens propulsion motors, which each drive a Z-drive propeller. Siemens also supplied a turnkey electrical equipment package for the new Canadian Louis S. St. Laurent icebreaker. It included electric drives, generators, switchgear and automation.

Gas Turbines

A new advanced marine gas turbine propulsion system for use in U.S. Navy ships is under joint development by Westinghouse Electric and Rolls-Royce, based on the Rolls-Royce RB211 gas turbine. The two companies will undertake the advanced development of a 19,685-kW intercooled recuperative (ICR) gas turbine engine system expected to improve fuel consumption by 30 percent. Westinghouse is responsible for the propulsion system integration, systems engineering and testing and overall engine performance. Rolls-Royce will handle the design, testing and performance of the gas turbine. The development program is expected to take four years.

GE Marine & Industrial has been the beneficiary of several recent orders from the growing fast ferry and passenger vessel market. A popular choice in the naval ship propulsion market, with more than 400 installations worldwide, the GE LM2500 was recently selected for installation on an Italian fast ferry. The Aquastrada from the Rodriquez Cantieri Navali will have a single 27,880-hp LM2500 gas turbine mod-

ule and two MTU 16V 595 TE70s, with a total output of 9,700 hp, in a Combined Diesel and Gas (CODAG) propulsion plant. The 331-foot ferry, with a passenger capacity of 400-500 and vehicle capacity of 90-120 cars, will be able to obtain speeds in excess of 40 knots. The owner has an option for two additional ferries.

A rugged two-stage variable-speed power gas turbine designed to drive water jets, propellers or electrical generators from Solar Turbines, Ltd., San Diego, is a new propulsion and auxiliary option for fast ferries in excess of 130 feet. The newly marinized 5-MW Centaur Taurus turbine from the Caterpillar Inc., subsidiary has high combustion efficiency, uniform temperature profile and low NO_x emissions.

Textron Lycoming Turbine Engine Division, a subsidiary of Textron, Inc., which provides the propulsion to military craft such as the Landing Craft, Air Cushion (LCAC), recently supplied a pair of TF40 marine turbines for the 84-foot megayacht Sea Walker in a CODOG (Combined Diesel or Gas Turbine) propulsion system. The megayacht, built in Italy for an Italian owner, has a top speed in excess of 80 knots. A pair of Detroit Diesel engines, Arneson surface-piercing propellers, and Allen Industries gearing make up the remainder of the package.

European Gas Turbines, the sole manufacturer of the NAPIER range of turbochargers and genuine spare parts, has introduced the NAPIER 457. The 457 was created to meet the increasing demand from engine builders for higher boost pressures at high overall efficiencies, a feat European Gas Turbines attempts to accomplish with advanced-technology turbine and compressor wheels.

Gearing

Lohmann + Stolterfoht is probably best known for gearing in large naval and commercial ships, particularly in the cruise industry, supplying some of the largest diesel-geared systems. L + S, however, supplies gearing from 1,000 to 40,000 hp input, and has developed lightweight high-performance gearing for military and other high-speed vessels. This new lightweight range is available from 1,000 to 6,000 hp input. This type of gearing has been installed in the M/V President. L + S also provides torsional couplings and clutches from 1,000 to 30,000 hp. L + S is particularly experienced with compound diesel drives that involve multiple PTOs often required in the cruise ship industry. L + S is represented in the U.S. by Marine Propulsion, Inc., Hammond, La.

In an effort to strengthen its position in the Strategic Sealift Ship Program, GE Navy & Small Steam Turbine, General Electric Company, Fitchburg, Mass., recently signed a technology transfer agreement with Renk Tacke under which GE has been licensed with respect to high-power medium-speed diesel reduction gears and clutches. The agreement will permit the two companies to work together on opportunities involving diesel engine reduction gears and clutches for ship propulsion systems.

GE manufactures main reduction gears for ship propulsion systems, steam turbines for marine and industrial applications, and generator sets for shipboard power.

Augsburg-based Renk, part of the MAN Group of companies, has extensive experience in the design and manufacture of single and multi-engine marine reduction gears driven by medium-speed diesels.

Marine Gears, Inc., designs and builds Haley marine reverse reduction gears for the workboat market. Haley gears are available in a range from 1,200-1,400 hp with engine speeds up to 1,800 rpm.

Propeller Systems, Bow Thrusters & Water Jets

Finnish shipbuilder Kvaerner Masa-Yards and AC electric propulsion specialist ABB Stromberg Drives recently signed an agreement on the development and marketing of an azimuthing podded propulsion unit called the Azipod. The Azipod has been specially developed for vessels which require a high degree of maneuverability, low noise and vibration levels, and a flexible machinery layout. Available in powers up to 20 MW, the Azipod incorporates an electric motor which drives a fixed-pitch propeller, The AC synchronous motor, located inside the pod, is controlled by a cycloconverter, providing full torque in any direction over a typical speed range of 0 to 200 rpm. The unit could find application in the offshore, icebreaking and passenger vessel market, and has already been successfully tested onboard a Finnish Board of Navigation icebreaking supply vessel.

Since the 1960s, well over 1,000 Aquamaster-Rauma propulsion units have been delivered worldwide. The standard Aquamaster-Rauma line consists of 360-degree steerable propulsion units with a power range from 160 to 4,000 hp. Custom-built units may have power ranges in excess of 10,000 hp. Four basic configurations of Aquamaster-Rauma propulsion units include hull-mounted, retractable hull-mounted, tiltable deck-mounted and tiltable and liftable deck-mounted. Medium-speed diesels and electric motors are the prime movers for the units. Aquamaster-Rauma recently received a second order to supply its largest stern azimuthing propeller units for a second Finnish Board of Navigation icebreaker. The 381-foot multipurpose icebreakers both feature a diesel-electric father-and-son main propulsion plant, consisting of two Wartsila Vasa 16V 32s and two Wartsila Vasa 12V 32s, with a total output of 21 MW at 28,600 bhp. The engines power two 7.5 MW Aquamaster-Rauma propeller units.

Omnithruster, Inc., a long-time supplier of water jet propulsion and maneuvering systems, recently introduced a new series of thrusters suitable for application in a wide range of vessels. Developed at the company's facility in Santa Fe Springs, Calif., the new series of Helconic thrusters is offered in sizes ranging from as small as 7 kilowatts to as high as 450 kilowatts (10-600 hp). The thrusters are particularly well-suited for shallow-draft vessels such as patrol boats and high-speed planing vessels, but can also be used in ships as large as 300 feet. Designed for main, auxiliary or low-speed propulsion, the compact HCT thrusters are made to operate with either constant or a variable shaft speed that does not have to be reversed to change thrust direction and can be operated in a manner similar to a controllable-pitch thruster with an accessory control system.

"Engineer a better fiber, and ultimately you've engineered a better product."

Because of the challenge faced by rope, cordage and fiber manufacturers — to construct a better polyester product for the wet environment — engineers at Allied-Signal Inc. were persistent until they discovered a solution — SeaGard®. The motivation for this was a basic part of the Allied Fibers philosophy: "engineer a better fiber, and ultimately you've engineered a better product". By utilizing Allied Fibers' high tenacity ACE polyester and then applying the SeaGard finish to the fibers, a better-performing, wet abrasion resistant rope was now able to be constructed.

In independent testing and in field testing by several rope manufacturers, ACE polyester SeaGard ropes — 3-strand and braided — outlasted and out-performed ordinary polyester ropes by incredible margins, even under the most severe wet abrasion conditions.

Today, many rope manufacturers have found that they require a higher level of performance plus cost-effectiveness for the most demanding applications, such as: tethers for balloons, underwater surveillance systems, offshore oil rigging and transmission & distribution (T&D) lines. ACE polyester SeaGard meets these requirements. And, for the sailor who wants the best in performance, SeaGard ropes offer that certain added security plus easy, smooth handling.

For further information and test results, contact: Dept. A-S, Suite 1500, 224 West 35th Street, New York, NY 10001.

Allied Fibers

Circle 200 on Reader Service Card

Allied Signal

P.P. Jet has been supplying water jets for more than 20 years, and offer units ranging in power from 500 to 4,000 hp. Being utilized in vessels from military crafts to fishing boats to ferries, P.P. Jet water jets are constructed of a mixture of glass fiber, kevlar and carbon fiber to make the units corrosion resistant and light in weight. All metal parts exposed to the water are made in stainless steel.

Hamilton water jets have been fitted on high-speed craft around the world. CWF Hamilton offers models spanning the power range from 100 to 5,000 kW.

Schottel Werft GmbH is best known for Schottel Rudder Propeller and Navigator units. The Rudder Propeller provides efficient highly maneuverable propulsion popular in coastal and tractor type tugs to 6,000 hp. Navigator units provide self-contained propulsion units for work platforms such as barges. Particularly, Schottel bow thrusters and SPJ Pump Jets have found numerous applications in the passenger vessel market. SPJ Pump Jets are capable of high static thrust shallow draft and 360-degree maneuverability, which make them suitable for main propulsion and thruster applications. With the same system, bow-mounted thruster units can provide additional propulsion or steering in any vector at full thrust. The system requires no additional draft to the basic hull design. Schottel is represented in the U.S. by Marine Propulsion, Inc.

Thrustmaster of Texas, Inc., offers outboard propulsion units for ferries, dredges, and various work barges. The Houston company, one of the largest manufacturers of these type hydraulic units, has systems with power ranges between 75-1,000 hp. The self-contained units typically offer 360-degree steering, propeller tilt and slow-speed high-thrust propellers.

Kort Propulsion, also represented by Marine Propulsion, Inc., is known for the Kort Knozzle. Kort Propulsion is also involved in other propulsion systems, such as Kort PP Jet High-Speed Jet Pump Systems. Kort PP provides jet pumps from 200 to 4,000 hp. The Kort PP Jet Pump is unique in that it is constructed of special GRP composite, which allows Kort PP to provide the water intake as part of the pump structure molded to fit the hull, eliminating the most critical factor of the pump jet installation. In addition, Kort Propulsion markets the Kort-MPC Two-Pitch Propeller, Kort-Hiemdal CP systems and Class S and fully machined propellers.

Rolla SP Propellers of Switzerland recently added REXPSC90/91-7 surface-piercing propellers to its extensive product line. The new model features seven blades, a 15-degree cleaver, diameters up to 34-1/4 inches, pitches from 40 to 46 inches, with standard 31, 33, and 36 tooth spline fitting. Rolla reports that the new design allows for greater thrust with a smaller diameter, as well as a more compact, less expensive drive system.

The model REXPSC90/91-7 is part of a family of Rolla's advanced steel propellers, the REXP line, that comprise over 100 different geometries investment cast in aerospace stainless steels.

The REXPSC90/91-7 have been specifically designed and constructed for large, extremely advanced surface drives, such as the Arneson ASD 12, 14 and 16 series.

Bird-Johnson controllable-pitch propellers are featured aboard U.S. Navy CG-47 Class cruisers in combination with Westinghouse reduction gearing and GE LM2500 marine gas turbines.

The propulsion plant is capable of powering the vessel to speeds in excess of 30 knots.

KaMeWa highly skewed controllable-pitch propellers continue to be a popular choice in the cruise ship industry.

KaMeWa props are featured on Carnival Cruise Lines' Fantasy Class ships, as well as the world's largest cruise ship, the 75,000-grt Monarch of the Seas.

The propulsion plant aboard the Monarch of the Seas consists of four SEMT-Pielstick 9 PC20L medium-speed diesels, with a total output of 21,840 kW (29,287 hp) at 475 rpm. The drive is through two Lohmann + Stolterfoht twin input/single output gearboxes.

IMC Appoints T. E. Magee As Operations Coordinator, Offers Free Brochure

Mineola, N.Y.-based International Marine Consultants, Inc., (IMC) part of the IMC Group, a leading ship management, operations and technical service organization, has announced the appointment of **Timothy E. Magee** as operations coordinator.

Mr. **Magee** is charged with the coordination of IMC's Marine Technical personnel in the field and aboard ships. An integral part of his responsibilities will be the monitoring of regulations and compliance with new federal Oil Spill Contingency Planning legislation. He has extensive vessel operations experience as a licensed ship's officer.

The IMC Group, which also includes International Marine Carriers, Inc., is now offering its latest brochure on effective ship management and operating procedures.

The free, full-color brochure provides important caveats and information to vessel and cargo owners, operators, charterers, shipyards, financiers and other marine-related organizations. The brochure also details the extensive capabilities and services available from IMC.

To receive a free copy of the IMC Group's new full-color brochure,

Circle 18 on Reader Service Card

Boston Whaler Delivers New Defiance 30' To Utah Parks And Recreation

The Utah Division of Parks and Recreation has recently taken delivery of a new all-aluminum Defiance 30' from Boston Whaler of Rockland, Mass.

The new boat replaces a 1977 Uniflyte 28' and will be used for rescue work and other missions where quick response to on-the-water emergencies is required.

The Boston Whaler Defiance 30' recently delivered to the Utah Division of Parks and Recreation.

Powered by twin Hamilton Water Jets that are driven by two 502-cubic inch Mercruiser gasoline engines, the Defiance 30' is a fast, rugged, versatile rescue boat well-suited for use in the shallow waters of The Great Salt Lake.

The Defiance hull incorporates the latest developments in Deep-V technology for aluminum construction and features wide side decks, abundant hand rails, engine serviceability, full 360-degree visibility and a wide beam for greater stability.

Optional electronics equipment chosen for the Defiance 30' includes: a Raytheon Radar System R 71X complete with compass sensor; a Raystar GPS plotter (complete); Raytheon Depth Sonar; and a data transfer cable.

To receive additional free information about the Defiance 30' or other marine craft constructed by Boston Whaler,

Circle 19 on Reader Service Card

IMMSCO, TPC Enter Joint Venture

International Marine Supply & Service Company (IMMSCO), a distributor for Rockwood fire fighting systems which are USCG, UL and U.S. Navy approved, has entered into a joint venture agreement with Technical Products & Controls (TPC) to supply total onboard fire fighting and safety systems.

TPC is a company with experience in the design, fabrication and start up of fire and gas detection and extinguishing systems.

For free information on IMMSCO's product line,

Circle 134 On Reader Service Card

The cruise ship MS Royal Majesty, built by Kvaerner-Masa Yards for Majesty Cruise Line.

Kvaerner Masa-Yard Delivers MS Royal Majesty

The 32,400-gt cruise liner MS Royal Majesty was recently delivered to its owners, the Majesty Cruise Line of Dolphin Cruises, Inc., Miami, Fla., by Kvaerner Masa-Yards, Inc., Turku New Shipyard, Turku, Finland.

Built at a cost of $220 million, the 528-cabin vessel will be used by Majesty Cruise Line to introduce a new segment in the Caribbean short cruise market.

The MS Royal Majesty was built to Det norske Veritas class +1A1, Ice 1A+, Passenger Ship A, Unrestricted Service for long international voyages with 1,746 persons onboard fulfilling the International Maritime Organization (IMO) rules and regulations for passenger vessels. The vessel will operate under Panamanian registry.

The cruise ship has been designed to meet the requirements for typical short Caribbean cruises and has been fitted with 16 suites, 253 deluxe class and 255 standard class cabins, 340 of which have large windows. The vessel can accommodate a crew of 549 in 253 cabins. The cabins are of modular construction and have been supplied by Kvaerner Masa-Yards Piikkio Works.

The large dining room Epicurean Restaurant on deck five has 568 seats. This entrance deck also accommodates the night club Royal Fireworks, a library, card room, meeting room, the rendezvous Square, video game room, photo shop and a shopping mall. Deck six is the main area of entertainment with the 602-seat show lounge, The Palace Theater, and the casino.

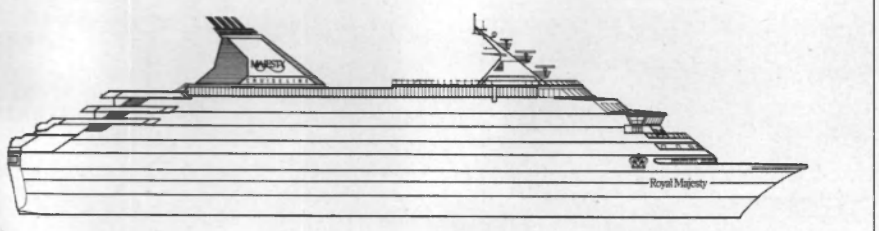
The MS Royal Majesty has an overall length of 568 feet, a breadth of 91 feet and a 20.5-foot draught. The ship has four resiliently mounted Wartsila Vasa 6R46 diesel main engines, rated at 5,280 kW each and giving the ship a service speed of 20.8 knots. The engines are coupled through Lohmann & Stolterfoht reduction gears to two highly skewed KaMeWa controllable pitch (CP) propellers.

For additional free information about the services and facilities offered by Kvaerner Masa-Yards,

MS ROYAL MAJESTY
Equipment List

Main engines (4)	Wartsila Diesel
Generators	ABB Stromberg
Generator engines (4)	Wartsila
CP propellers (2)	KaMeWa
CP thrusters	KaMeWa/Wartsila
Thruster engines	Siemens
Reduction gear	Lohman & Stolterfoht
Engine controls	Valmet
Steering controls	Teebul
Deck machinery	Aquamaster Rauma
Shafting	Simplex
Fin stabilizers	Sperry
Pumps	Iron, Leistritz
Coatings	International Paints
VHF radio(s)	Sailor
SSB radio(s)	Skanti
Radar, Autopilot	Krupp-Atlas
Compass	Anschutz
Loran	Raytheon
Satcom	JRC
Air conditioning	Hi-Pres
Garbage disposal	Deerberg

Circle 150 on Reader Service Card



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The International Association of Independent Tanker Owners (Intertanko) is a group of independent owners which controls about 1,800 vessels of 170 million deadweight tons in 300 member companies based in 36 countries worldwide. Intertanko has two main goals, one is to preserve free competition in the tanker market and the other is to promote safety at sea and a cleaner marine environment.

The average age of the tanker fleet is approaching 14 years—the bulk of the tonnage was built between 1974 and 1977. Of course age should not be focused in isolation from other factors when marine safety is considered. Many of the tankers built in the early seventies are not inferior to their younger colleagues. On the contrary, they were built with a steel thickness more robust than the younger generation of tonnage.

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The famous Valdez spill in Alaska in March 1989 was big, but was only 30 percent of the spill caused by the Torrey Canyon in the English Channel in March 1967. The Valdez spill was only 15 percent of the Amoco Cadiz spill on the French Coast in March 1979. If one compares the performance of all tankers, an impressive reduction in oil pollution accidents would be seen.

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The interaction between OPA 90 and the renewal of the tanker fleet cannot be seen in isolation from what has happened in the market place during the last decades.

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Seventy-five percent of the order book is contracted by optimistic independent tanker owners. Most of the tonnage is ordered without any cargo guarantee, which sometimes is called speculative ordering.

With 75 percent of the order book for independents and four percent for the major oil companies, this leaves some 20 percent to stateowned tanker and oil companies, in particular Middle East interests.

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One should try to avoid seeing the effects of OPA 90 out of context. It must be related to other events that have happened in the market place. The very poor market this year may alone explain the few orders. But can the freight developments alone explain the downward trend in ordering after August 1990? OPA 90 may have had an effect as a disincentive to renew the fleet.

The effects of the debt-financed renewal process in the 1980s have left the industry with too little equity capital. Their assets are aging, deteriorating and losing value with a rate of return on invested capital which entirely fails to justify reinvestment in new assets.

Of importance to the renewal process is that the cost of a double hulled VLCC is 15-20 percent more expensive than the conventional design.

The possibility of facing unlimited liability which could exceed what is available in insurance cover, has of course caused great concern for bankers and financial institutions.

Shipping banks may find their mortgage on a vessel rendered worthless in the event of an oil spill.

It now appears that most banks include Additional Perils (pollution) Insurance in all new loan facilities for tankers that may trade to the U.S. The premium is paid by the bank and reimbursed by the client.

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FINAS 100. All relevant information for navigation, fish determi-

Hinges On Cost Reductions

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ABS Releases Guide To

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The proposed regulations include roll-on/roll-off vessels and dry cargo vessels which are less than 328 feet long, and also feature a section which defines "subdivision length" and "new ship," as well as loading restriction requirements. Calculations would be made for each ship to which the regulations apply in order to demonstrate compliance with the international requirements for damage stability of dry cargo ships. For vessels less than 328 feet in length, a required index would be calculated from a given equation.

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Artist's conception of 96-foot passenger/auto ferry Wm. Market.

The name of the new vessel will be the Wm. Market in honor of the president and CEO of the company. The Wm. Market will be 96 feet long with a beam of 38 feet. The ferry will have accommodations from 20 autos/260 passengers up to 500 passengers. Power will be supplied by twin Caterpillar 3412 DITA diesel engines of 620 horsepower, each turning a 56-inch, four-blade propeller. Cruising speed will be 13.8 knots.

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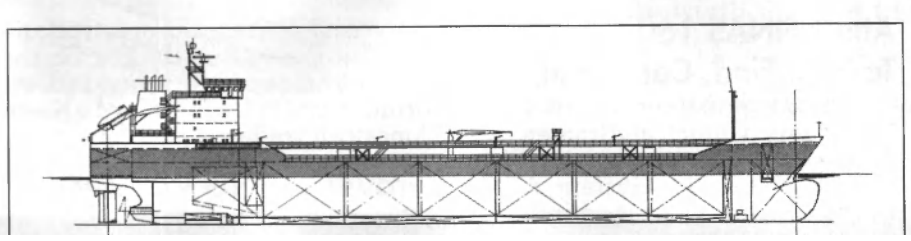

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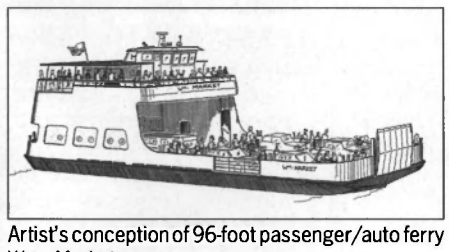

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Atlas' FINAS 160 Developed To Help Find, Catch Fish

For use on fishing vessels, Atlas Elektronik GmbH of Bremen has developed the new, integrated Fishing and Navigation System, Atlas FINAS 160. All relevant information for navigation, fish detection and catching is functionally combined here in a single system, thus greatly easing the task of the fisherman, who has to make effective decisions during the catching process.

The number of sensing and control devices on the ship's bridge is continually increasing, requiring the monitoring of numerous displays. The Atlas FINAS 160 acts as an operational center, displaying the situation in the fishing region on a high-resolution color screen. The skipper thus has access to all information at a glance.

These high requirements for fast display and reliable decision-making made it necessary to introduce a special multi-processor computer system for the Atlas FINAS 160. As a result, twelve different sensors such as: radar, fishing echosounder and satellite navigation equipment - can be connected to the system and their signals can be processed. The display has 16 colors and 1,024 by 768 pixels. The graphic functions are performed more than a hundred times faster than in a conventional PC graphics system.

For future considerations, the programming system is flexible and it is possible to introduce extensions later on without difficulty.

For free literature describing the Atlas FINAS 160,

Circle 12 on Reader Service Card

Texaco Pays $59 Million For Last Lasmo Tanker

Texaco has purchased the suezmax tanker Citadelle from the UK oil and energy group Lasmo for $59 million. The Citadelle, a 148,500 - dwt tanker currently under construction in South Korea, is the third, and last to be sold, in a series of suezmax tankers ordered by Lasmo's subsidiary Ultramar in 1990 from Samsung Heavy Industries in South Korea.

The Citadelle meets all U.S. Oil Pollution Act standards and new regulations for double hulls adopted by the International Maritime Organization, and is scheduled to trade in U.S. waters.

Hapag-Lloyd Continues Buying Reefer Containers

Hapag-Lloyd Inc. plans to have 400 new reefer container units enter service before the heavy shipping season for refrigerated products, and the company is continuing to buy new units. The Hamburg-based company ordered 200 containers from a Florida-based company, significant as it is the first time the carrier ever placed a reefer container order with a U.S.-based company.

Offering weekly reefer service to and from Northern Europe, Gulf and Atlantic Coasts and the Pacific, the new containers are scheduled for primary use in Hapag-Lloyd's North American trade.

Growth of LNG Worldwide Hinges On Cost Reductions

The worldwide demand for liquefied natural gas (LNG) is looking up, so long as producers, sellers, and deepsea transporters of LNG can manage to bring the costs down.

This message came from the LNG 10 Conference at which approximately 2,000 participants from all over the world gathered recently in Kuala Lumpur.

Considering the world's depleting oil resources coupled with the burgeoning demand for new power plants in the Pacific Rim, Latin America and eastern Europe, the golden age for LNG is approaching, said conference officials. The world LNG trade is expected to double or triple over the next two decades, provided certain costs can be contained.

For example, marine transport in methane carriers can account for 30 percent of LNG's total costs.

French partners GdF, Total, Elf Aquitaine and the French Petroleum Institute have formed a coalition to find ways of reducing marine transport costs by one-third. To date, two possibilities under consideration to slice transportation costs include: extending existing LNG transport ship's service lives, as first generation ships are reputed to be strongly built with a variety of design options; and construction of new ships with capacities of up to 200,000 cubic meters, with lower boil-off rates and new propulsion and control systems.

Shipping costs are not the lone factor under scrutiny, however. The price of developing gas fields accounts for approximately 50 percent of the total cost of an LNG project. One alternative currently being used is extending the facilities and capacities of existing production facilities.

Krupp MaK To Supply Engines For LPG Ships

The primary propulsion unit for the newest Unigas liquefied gas carrier ordered from Appledore Shipbuilders is a 6M551-type engine supplied by German diesel manufacturer Krupp MaK. The new series of 3,400 cubic meter and 4,400 cubic meter modern chemical gas carriers, to be operated within the Unigas BV pool, are being supplied from various European shipyards, including Appledore and Richard Dunston (Hessle). All told 12 ships worth approximately $180 million were ordered. Of those 12, eight are scheduled to be built with MaK main propulsion units.

The smaller 3,400 cubic meter capacity Appledore ships are to be powered by Krupp MaK's 8M453C-type diesel engine, while the larger 4,400 cubic meter Richard Dunston ships will be propelled by the 6M551-type units. The even larger 5,600 cubic meter Appledore vessels will also have the 6M551-type units on board.

Unigas associate member Othello Shipping has ordered a ship similar to those being built by Richard Dunston, outfitted with a MaK551 diesel.

For free literature on the complete diesel line produced by Krupp Mak,

Circle 17 on Reader Service Card

ABS Releases Guide To Assess Fatigue Strength

The Guide for the Fatigue Strength Assessment of Tankers, targeting surveyors using designer-oriented fatigue assessment methods for tanker structures, has been published by the American Bureau of Shipping (ABS).

Included in the guide is information on fatigue-strength data, structural detail classification, design loads, structural modeling procedures, permissible stress ranges and the treatment of stress concentrations. The guide's criteria are complete in terms of the load components as well as types and locations of structural details considered.

To accompany the guide ABS also developed a PC-based software program to allow the use of fatigue assessment criteria in the Fatigue Guide. Used in conjunction with the guide, the software system will make calculations easier, the ABS claims. The guide and software program are timely as concerns persist about the use of high tensile steels in tanker hull construction, and its correlation to premature fatigue-induced fracturing. Traditionally fatigue-induced fractures occurred late in the vessel's life. However, existing design practices which don't specifically consider fatigue as a failure mode were accepted and fatigue fractures were repaired as ordinary ship maintenance.

New Double-Hull Tanker Design Developed By Lindenau To Meet MARPOL, OPA Rules

Kiel-based German shipbuilder Lindenau Werft has completed the development of a new double-hull tanker class to meet the provisions of both the recently adopted MARPOL regulation 13F and the Oil Pollution Act of 1990 (OPA 90).

Called the Lindenau Tanker Class 2000, the design is based on the experience the yard has gained from the construction of 38 tankers, ranging in size up to 25,000 dwt. The yard designed and built its first double-hull tanker over 16 years ago in 1976. Since then, Lindenau has delivered 15 double-hulled tankers to international customers.

Approved construction plans have already been granted to the Lindenau Tanker Class 2000 by the classification societies of Lloyd's Register of Shipping, Det norske Veritas, Germanischer Lloyd, American Bureau of Shipping, and Bureau Veritas.

The Tanker Class 2000 design is offered in capacities between 1,500 dwt and 30,000 dwt in over 100 variations.

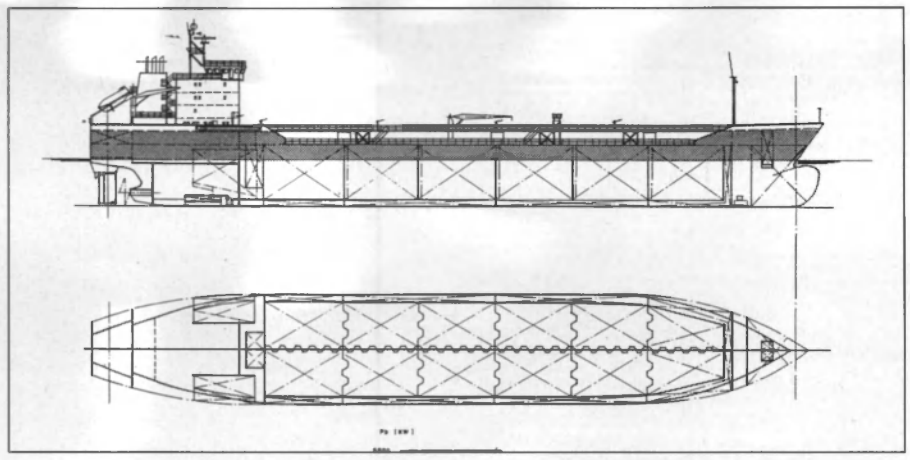
The ship has a double bottom with 300 - mm deadrise and a 1,350 - mm wide double side in transverse framing system with extra intermediate frames in the ice belt. The special double-hulled construction is designed "surveyor friendly" and offers increased collision resistance in the cargo tank area compared to single hull vessels. This translates into reduced risk of pollution after accidents at sea. Additionally, the insulating layer of air in the double hull also saves on cargo tank heating.

Extensive use of both remote control and management systems also contribute to safe and low-cost operation. Some of the systems include: remote controlled cargo and ballast valves; a tank radar content measurement system for all cargo tanks; a pneumatic content display for all ballast, fuel oil storage and drinking water tanks; a cargo tank temperature measurement system, as well as a draft measurement system on-line to the load control computer.

The engines are fitted with a central alarm and control system and there is remote control of the fuel oil and sea valves.

In Scandinavia, for example, these systems enable the ship to be operated by a crew of 11.

Exhaust gas energy is reused for ship operation (600 kW gas boiler), while 1,500-kva shaft generator is used for on-board electricity.



Drawing of a 17,000-dwt version of Lindenau's new Tanker 2000 Class design.

The main engine is a four-stroke new generation Krupp MaK 6M601, with an output of 6,600 kW (8,850 bhp) at 500 rpm. This engine can be operated with low-cost heavy fuel oil IF 380. To power the cargo pumps, the shipyard has selected three Caterpillar diesels, each producing 845 kva at 1,800 rpm, and an additional 135-kva diesel generator for emergency power.

To provide optimal maneuverability, the ship has a Willi Becker rudder and, a Schottel pump jet, with an output of 1,000 kW.

For free literature detailing the new Lindenau Tanker Class 2000 design,

Circle 41 on Reader Service Card

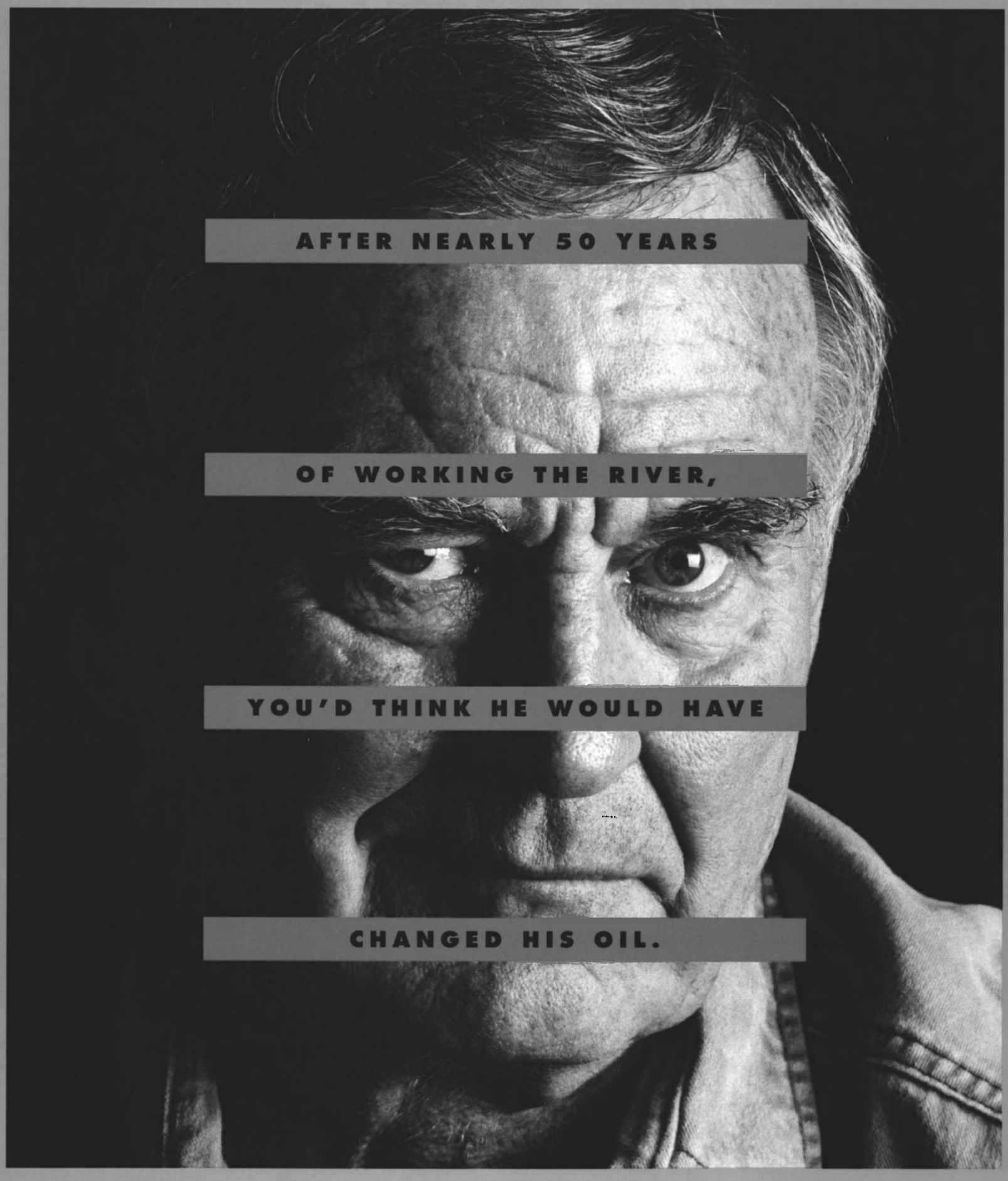
Roland Marine Named Agent For Kobelco Sterntube Seals

Kobe Steel, Ltd., Tokyo, has merged their marine sterntube division with Shinko Kure Service to form Kobelco Marine Engineering Co. Ltd.

Roland Marine, Inc., New York, will continue to act as agent for the company in the U.S. and Canada. Roland will market the simplex type Kobelco compact and standard sterntube seals.

For more information about Roland Marine's product line,

Circle 73 on Reader Service Card



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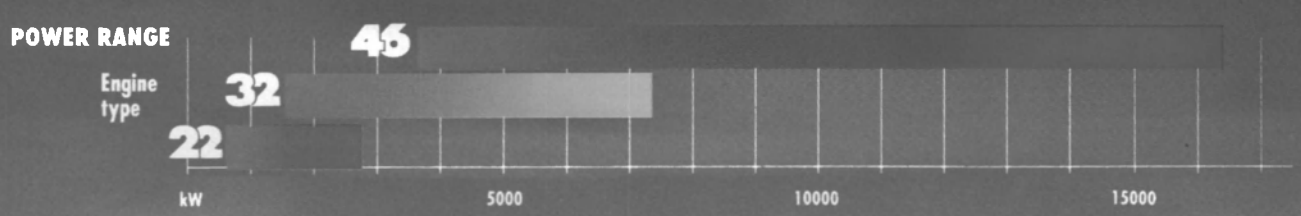

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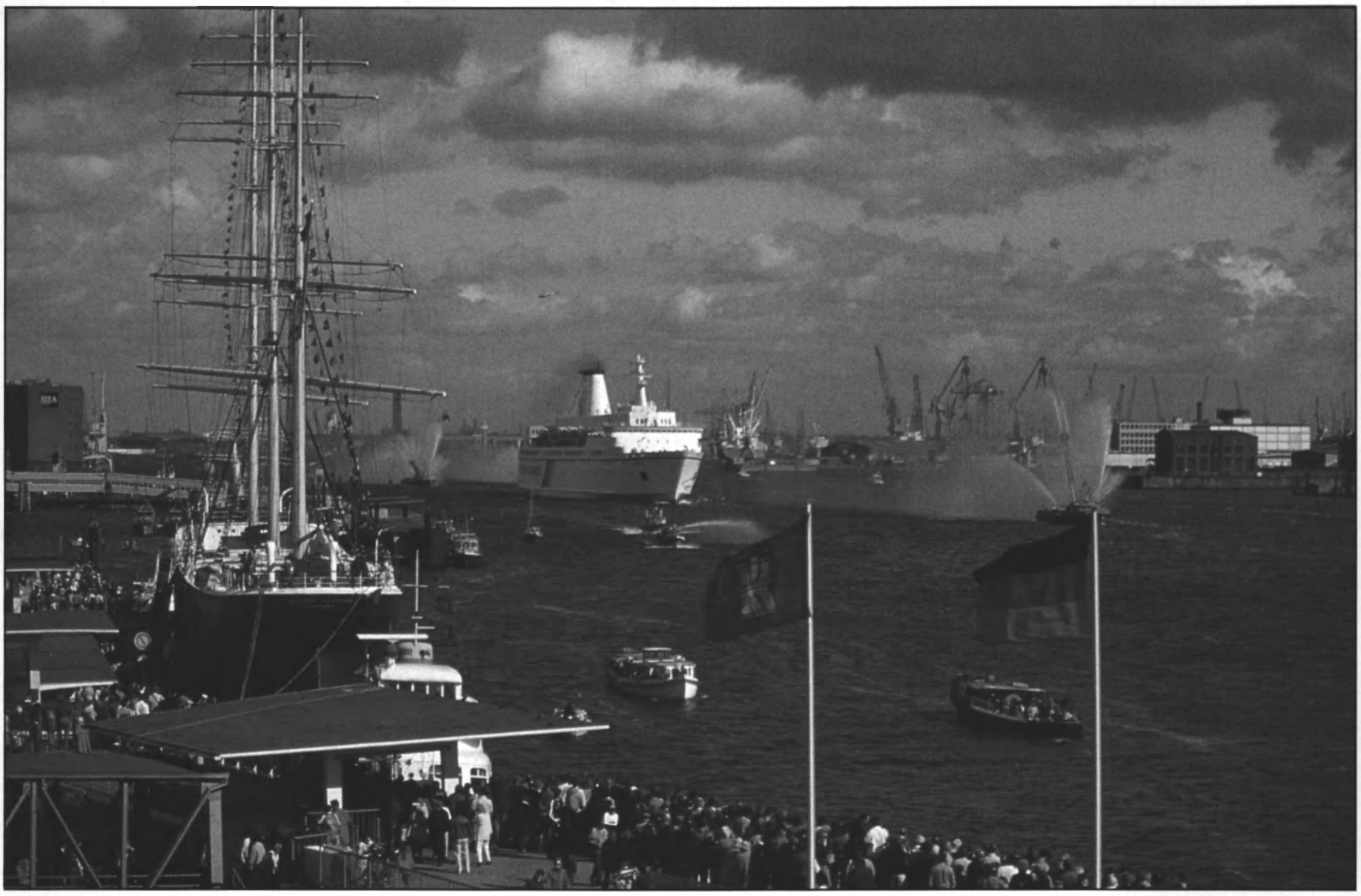

SMM '92-THE HAMBURG SHOW

International Shipping & Marine Technology Market
September 29-October 3

Situated on the Elbe River in the center of Europe, the modern port city of Hamburg, with a maritime tradition dating back more than 800 years, will once again play host to one of the world's largest biennial trade exhibitions for the shipbuilding, marine technology and marine equipment industries.

Scheduled for September 29 to October 3, 1992, the International Shipping & Marine Technology Market with Congress, more commonly called SMM '92, is expected to draw more than 30,000 visitors from 50 countries to the Hamburg Exhibition Center located in the heart of Hamburg. Sections of the exhibition area, which covers over 462,680 square feet in 12 halls, will be dedicated to: the shipbuilding industry; installations and equipment; engines and propulsion systems; electrical systems and electronics; pumps, compressors, fittings and auxiliary machinery; cargo-handling systems; port services and waste disposal; ports, shipping companies and waterways; marine and offshore technology; national joint ventures; research and development; education and training; and classification. Between 500 and 600 exhibitors are expected to have stands, with national participation from Canada, the Commonwealth of Independent States, Czechoslovakia, Denmark, Finland, France, Hungary, Italy, Japan, the Netherlands, Norway, Poland, South Korea, Spain, Sweden, the United Kingdom and the United States.

Although orders for new ships fell last year, due for the most part to the uncertainty surrounding new environmental legislation, world economic conditions and the impact of the Gulf War, most analyses point to continued growth for the maritime sector in the 1990s. Moreover, environmental awareness will increase worldwide with higher demands on safety and environmental protection. This will require new investment in the existing fleet as well as purchases of new vessels. Norwegian owners alone are expected to invest as much as $25 billion on new ships over the next five years.

The German Federation of Shipbuilding and Marine Technology (VSM), for example, considers 1991 to have been a successful year for shipbuilding, especially with regard to the delivery of a number of special purpose-built ships and the development of new concepts. VSM's optimism perhaps can be traced to the continued need for the upgrading of the aging world fleet, the expansion of global trade and the compelled replacement of some tankers due to new OPA 90 and the International Maritime Organization (IMO) rules governing the tanker fleet. At the end of 1991, the world order book stood at 43 million gross tons, its highest level since 1977. It was the fifth consecutive year that the order book has risen.

Furthermore, the political changes in Eastern Europe and the introduction of the single European Market represent substantial opportunities for the international maritime industry.

The impact and repercussions of all these social, political and economic factors will be examined and discussed during the five days of the exhibition and accompanying congress.

Joint Stand On Pollution Control

In light of new regulations governing oil spillage, exhaust emissions and waste disposal, as well as the general heightened awareness for the global marine environment, a joint stand at SMM '92 intends to demonstrate the leading technology to detect and fight marine pollution. The IMO will present specialist publications dealing with the subject of marine

environmental protection. Besides participation from several companies and the IMO stand, there will be special displays on marine environmental protection run by the German Federal Shipping and Hydrography Office, the German Transport Ministry, Hamburg Meteorological Office, the MARPOL Department of Hamburg's Environment Ministry and Hamburg Technical College.

East German Shipbuilding Highlighted

This year is the first time that SMM has been held since the unification of Germany. To mark the event, a special exhibit will center around the new technology emerging in the east German marine industry. At a joint stand, eastern Germany's shipbuilding industry will be demonstrating its achievements in the new market economy climate. The Exhibition and Fair Committee of German Industry (AUMA) is providing financial support for 18 small- and medium-sized firms who will jointly display products ranging from diesel engines, pumps and compressors to navigation, machinery monitoring systems, and lifeboats.

Norway This Year's Maritime Partner

Following the Soviet Union's participation at SMM '90 as the event's official national "Maritime Partner," 40 Norwegian marine technology firms have banded together to make up the "Norway—Your Maritime Partner" stand at SMM '92. The exhibitions at the joint stand, organized by the Norwegian Trade Council, will cover most aspects of the maritime industry in Norway, but there will be particularly prominent participation by ship equipment suppliers, shipbuilders and consultancy services such as shipbroking, classification and ship financing. Safety, marine environmental protection and quality management will also be prominent themes at the joint Norwegian stand. Norwegian shipping companies own or operate about 10 percent of the world's merchant fleet and 20 percent of the world's offshore fleet. Norway's merchant fleet consists of some 1,700 vessels with a total tonnage of 58 million grt. Additionally, the Norwegian marine and offshore industry is of major importance to the shipbuilding industry and has gained a renowned international reputation for developing state-of-the-art technology and systems.

Norway's designation as partner country at this year's SMM also means that it will play a decisive role at the accompanying congress, "SEA 2000." The congress will tackle topics such as shipping and shipbuilding, offshore technology and ports as the interface between seaborne and inland waterway transport. Representatives of the Norwegian maritime industry will be among the keynote speakers at this three-day conference.

For further details on SMM 92, contact: **Ulf Richter** at the Hamburg Messe und Congress GmbH, Jungisstrasse 13, Messehaus, W 2000 Hamburg 36; telephone: (+49) 40-3569-2440.

SMM 92
Exhibitor List

Anschrift
Admos-Gleitlager
Aggreko Deutschland
Ahlmann Systemtechnik
H. Albert
Alfa-Laval Industrie
Alki-Technik
Allweiler
Aluminium Schiffswerft
Anschutz
Antwerp Shiprepair
Apollowerk Gossnitz
Aqua Signal
Armbrecht & Partner
ABB Industrie & Automation
Astilleros Espanoles
ASUG
Atlantic Marine
Atlas Elektronik
Auma-Riester
Austria Buntmetall
Autokran-Centret
Averhoff-Orwak
Avit

AKO-Aug. Koch Maschinenfabrik
AWP Kalte-Klima-Armaturen
BEST Ventil & Fitting
Bacho
Fritz Barthel Armaturen
Barthels & Luders
Bayley Suit
Willi Becker Ing.
Behr Industrietechnik
Heinrich Behrens Pumpenfabrik
Beldam Crossley
Bert & Siebert Ing.
Bestobell Mobrey
KG Beta Petrochemie
Binder Magnete
Deutsche Binnenwerften
Blohm & Voss
Bode
August F.M. Bohnhoff
Bolidt Kunststoftoepassing
Boil & Kirch
J.H. Bornemann
J. Bornhoft Industriegerate
BP Bunker
Rich. Ad. Brandt
Brattberg-MCT
Braunschweiger Huttenwerk
Bremer Vulkan
Bundesamt fur Wehrtechnik & Beschaffung
Feodor Burgmann Dichtungswerke
Busak & Luyken Dichtungen
BST Rudolf Dopfl
Controle Mesure Regulation CMR
Caltax Marine Diesel
Cassens & Plath
Castrol Marine Oil
Centa Antriebe
Centromor
Ceske Lodenice
Chris Marine
Holger Clasen
Classen
Clayton Deutschland
Comsat Maritime Services
CONIMEX
Conoship International
Consillium
Conver-OSR
Coppus Engineering
Corrobesch Vertriebsges.
Carl Croonen
Cummins Diesel
CP 3500 Manufacturing
Dammstoff-Industrie
Damen Shipyards
Danish Export Group
Danish Maritime Institute
Datema Delfzijl
Deckma
Deckma Hamburg
Deep Sea Seals
Deerberg-Systems
Deif
Depac
Deugra
Deutsche Maschinen & Schiffbau
Deutsche Shell
Deutz-Motorenwerke
H. Dewers
Diesel Elektrik F. Tacke
Diesel Marine International - (Deutschland)
Dieselmotorenwerk Rostock
Dillinger Huttenwerke
Albert Diedr. Domeyer
Karl Dose
DCN International
DMS Dieselmotoren & Geratebau
DSG D. Schmidt, Pneumatik-Hydraulik
DVZ Services
Ehlers
H.E. Eissing KG
Elna Elektro-Navigat & Ind.
ELTECH
Eltz KG Berlin
Endress & Hauser
Enex
Esso
Euronavy Espana
EB Nachrichtentechnik
EDO Corporation Acoustics Div.
Dr. Fahrentholz
Fr. Fassmer
Fehrmann
Ferropilot
Fincantieri-CNI
Finnish Foreign Trade Assoc.
Georg Fischer
Flensburger Schiffbau -Gesellschaft
Forjas y Aceros de Reinosa
Friedrichs Armaturen
Fare Armaturen
FIMAG Finsterwalder Maschinenbau
FSS Finnish Shipbuilding Suppliers Association
Gall & Seitz
Peter Gast Shipping
Gdansk Shiprepair Yard
Dr. Ing. Geislinger
Germanischer Lloyd
Gestra
Giant Lion Know-How
Gisma Steckverbinder
Ernst Gopfert Armaturenfabrik
Goetze
Granges Metalock
GROMEX
Grosshandels & Lagerei Berufsgenossenschaft
GAFLO Pumpen Vertrieb
GAT Gamma Analysentechnik
GEA Luftkuhlergesellschaft Happel
GHR Hochdruck-Reduziertechnik
GS-Hydro Oy
Hafen Hamburg
Hagglunds Marine Equipment
Hagenuk Vertriebs & Service
Hamann Wassertechnik
Hamburgische Schiffbau-Versuchsanstalt
Paul Hammelmann Maschinenfabrik
Hamworthy Engineering
Schiffahrts-Verlag Hansa C. Schroedter
Hapag-Lloyd
Harzer Werke
Ernst Hatecke
Hatlapa-Uetersener Maschinenfabrik
Hatz Motorenfabrik
Haux-Life Support
Georg Hechelmann Nachf.
Heinen & Hopman Engineering
Ernst Heinrich
Hempel Farben
Rolf Heun
Hilbig Schweisstechnik
Hoerbiger Ventilwerke
Honeywell
Hoppe-Bordmesstechnik
Dr. E. Horn
Howaldtswerke Dt. Werft
Ludwig Hunger Werkzeug & Maschinenfabrik
Hydromarine
Hydromod Scientific Consulting
Hygrapha
Hytorc Drehmomentschrauber
HKS
HSB International
HTI Hock-Temperatur Ind.
A. Ibach
Ibak Helmut Hunger
Ifea Industrievertretungen fur Elektrotechn. Artikel
Imatrans Hyswerktuigen
IMO
INCOR
Ingenieurburo Guenther Boening
Inmarsat International
IST Intercom Systemtechnik
Intergraph (Deutschland)
Intering
Intermarco Im- & Export
International Farbenwerke

Interschalt
Invest-Import
Ippokampos
IWK Regler & Kompensatoren
IBH, Ingenieurburo Harm Antriebstechnik
IBKA Industrieservice
Instituto Nazionale Per Il
ILS-Inventory Locator Service
IMO
International Marine Software Associates
Japanese Maritime Equipment Association
Jastram-Werke
M. Jurgensen
Kabelwerke Friedrich C. Ehlers
Kaefer Isoliertechnik
Fritz A. Kahler
A. van Kaick
Dietmar Kammer
Karberg & Hennemann
Karberg & Schmitz
Karle & Fuhrmann
KGW
Schwermaschinenbau Kirow
Kistler Instrumente
Gunther Klein
Gebr. Kluver
Kobelt Manufacturing
Kockums Computer Systems
Wilhelm Kopp
Koser-Marine-Kiel
Kolbenschmidt
Kompressorenbau Bannewitz
Konus-Kessel
Korea Chemical
Krautler Pumpen
Emil Kritzky
Krupp MaK Maschinenbau
Kupke & Wolf
Kvaerner
KGW Schweriner
Kuhlautomat Berlin
KSR-Kubler Steuer & Regel Technik
L & M Pumpenservice
L & S Elekrotechnik
L'Orange
Kurt Lautenschlager
Wilhelm Layer
Le Bronze Industriel
Lehmann & Michels
Leistritz Aktiengesellschaft
Lenexpo
Liebherr-Werk Nenzing
FAC van d. Linden
Lips BV Propeller Works
Lloyd's Register
Willibrord Losing
Loggers Schwingungs Technik
Loher Aktiengesellschaft
Herrn
Lyngso Marine
LTC Deutschland
Maag Getriebe
Markisches Werk
Mahle
Mannesmann Rexroth
Manufacturas Aranzabal
Manufacturas Honorio Florez
MAPROM Engineering
Mar-Tec Marine Beratungs & Handelsgesellschaft
The Institute of Marine Engineers
Maritex, Swedish Telecom Radio
Martimex
Meerestechnik-Elektronik
Meeves Marine Service
Merlin Gerin
Metritape Inc.
H.J. Hausschild
Jos. L. Meyer
Rudolf Otto Meyer
Miba Gleitlager
Minimax
Motorola
Muhlhan
MAN B&W Diesel
MP-PESCH Marinescheinwerfer
Munchmeyer Petersen
Marine Schiffstechnik
Motoren & Turbinen Union
MWB Motorenwerk Bremerhaven
Nabertherm
Nautilus Marine Service
Nautiservo
Navimor Ship Trading
Navitronic
Neuenhauser Kompressorenbau
Niehuis & van den Berg
Manfred J.C. Niemann
Nieuwe Scheepswerven
Nolte Handel
Noris Tachometerwerk
Norwegian Trade Council
Noske-Kaeser
Norddeutsche Filter Vertriebs
O & K Anlagen & Systeme
O.C. Elektronik
Fernsteuergerate Kurt Oelsche
Ostermann Schiffs-schrauben
Officine Meccaniche Torino
Pasco Handels
Permalight
J.H. Peters & Bey
Phoenix Contact
Hans-Ulrich Pillekamp
G. Pinnow, Ing.
Pintsche Bamag
C. Plath
Pleuger Worthington
Podszuck
Robert Prinz
Pruftechnik
Pumpenwerk Erfurt
Radio Holland Group
Radio Zeeland
Randers
Rasmussen
Realtime Information
Rechlin Schiffswerft
Technisches Buro
Dipl. Ing. Herwarth Reich
Eisenwerke Reinjes
Renk
Reson Systems
Rickmeier
Rochem Ro
Schiffselektronik Rostock
The Royal Institution of Naval Architects
Royal Schelde
Ruston Diesels
RAI Gebouw
RWO Maschinenfabrik
Sabroe Industriekalte
Wilhelm Sander Fertigung
Santon Holland
J.P. Sauer & Sohn Maschinenbau
Sayrotechnik
Scan-Parts Handels
Scantrading Marine Equipment
Schiffsdieseltechnik Kiel Off. & Grosse-Hellweg
W. Schmidt-Bretten
Eugen Schmidt
Schmitz & Schulte
Schottel-Werft
Otto Schuchmacher
A.W. Schultze
W.G. Schulz
Schwermaschinenbau
C.H. Schafer Getriebe
Sebert Schwingungstechnik
Seehafen Verlag
Deutscher Wetterdienst Seewetteramt Hamburg
Serck Como
Shipmate Robertson
Shipping & Trading
Siemens Aktiengesellschaft
J.J. Sietas KG, Schiffswerft
Sika, Dr. Siebert & Kuhn
SKL Einspritzgeratewerk Aken
Sokkia, Industrial Surveying
Sperry Marine
Walter Sporleder
H.A. Springer Marine & Industrie Service
Stal Marine
H.M. Stein Sohn
Stell
Nikolai von Stempel OHG Industrievertretungen
Stop-Choc Schwingungstech.
Stork Bronswerk
Stork Pumpen
Stork Jaffa
August Storm
Stromag Maschinenfabrik
Sud Marine, Ship Repair
Sulzer Brothers
Svensk Sjofarts Tidning
SWEP Warmetauscher
Ship's Equipment Center
SKL Motoren & Systemtechnik
STE-Schwingungstechnik
STN Systemtechnik Nord
Seebeck Techno Product
Taisei Engineering Consultants
Takraf Schwermaschinenbau
Taxt Louis
Technische Universitat Hamburg
Techmo Schiffs & Hafentechnik
Teldix
Tempelmann Feinwerktechnik
Tenmat
Hans-Joachim Tilse
Top Marin
Trimble Navigation Europe
Triton-Belco
Turbo-Technik Reparatur-Werft Dassler
Trouvay & Cauvin
Telekom Deutsche Bundespost
Top Master Paints
TRW Nelson
Ulstein Meerestechnik
Umweltbehorde Hamburg
Freie & Hanestadt Hamburg Umweltbehorde Techn.
Uberwach
Unid- U. Schreiber
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Vecom
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J. Verhaar
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J. M. Voith
Volvo Penta Deutschland
RJ der Vries
Vulkan Kupplungs & Getrie-bebau
VDMA
Verein der Schiffs-Ingenieure zu Hamburg
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W/S/P Werbeagentur
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WAGO Kontakttechnik
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Willbrandt
WISKA Hoppmann & Muisow Armaturen-Wolff
WOMA Apparatebau
Woodward Governor
WIWA Wilh. Wagner
York International
Zahnradfabrik Friedrichshafen
Zahnradpumpenfabrik Mannheim
Zakrewski Wiseman (PTY)
Zeppelin-Metallwerke
Zollner
Zoepffel & Schneider Werft & Ind.-Vertretungen
Uwe E. Zoller
Zollern Vertriebs

The Kaimikai-O-Kanaloa following christening ceremonies at Bender Shipbuilding.

Bender Shipbuilding Christens Converted Research Vessel For Hawaii Undersea Research Laboratory

Bender Shipbuilding & RePair Co., Inc., recently joined the University of Hawaii's Hawaii Undersea Research Laboratory (HURL) in christening the 220-foot oceanography research ship Kaimikai-O-Kanaloa at Bender's yard in Mobile, Ala.

HURL has been designated as the National Oceanic and Atmospheric Administration's (NOAA) National Undersea Research Center at the University of Hawaii. The Kaimikai-O-Kanaloa will be used for research programs on ocean resources, ocean chemistry and climate within the economic zone of the United States and elsewhere in the Pacific Ocean. Through these programs NOAA will be able to determine the distribution of potentially valuable mineral resources on the sea floor and fisheries on seamounts.

Dr. Alexander Malahoff, director of HURL, and **Thomas B. Bender, Jr.**, president of Bender, spoke at the christening ceremony. **Beverley M. Malahoff**, the vessel's sponsor, christened the vessel Kaimikai-O-Kanaloa, which means "heavenly searcher of the sea" in the Hawaiian language. Dr. **Malahoff** praised NOAA and the U.S. Congress for providing the funds to convert the vessel, as well as commending Bender and American shipbuilders in general for keeping the price of converting these vessels down. The base contract amount for the conversion work performed by Bender was $4 million.

The vessel reportedly combines the use of a remotely operated ocean bottom survey camera system; and undersea robot or remotely operated vehicle (ROV); and a manned submersible, the Pisces V. All of these systems are operated from the stern of the ship using an A-frame crane for launching and recovery operations. According to reports the Kaimikai-O-Kanaloa is the only U.S. university vessel specifically designed to support a research submersible.

The vessel was converted from the former Western Strait, which was an inactive research vessel. According to sources at Bender the conversion basically involved reconstructing the entire vessel from the hull up and adding a 30-foot midbody to extend the vessel from 185 feet to its present length. A raised deck and submersible hanger were added to allow for the submersible and ROV to be brought on deck for maintenance. Work on the ship began in mid-September 1991.

Founded in 1919, Bender Shipbuilding & Repair Co., Inc. is a full-service shipyard that builds, converts and repairs vessels for both commercial and government owners and operators.

For further information about the services and facilities provided by Bender Shipbuilding,

Circle 26 on Reader Service Card

Maritime Bills Cleared By House Of Representatives

Among more than thirty bills approved by the House, several directly affect the maritime community. The House passed by voice vote H.R. 5674, a bill which includes clarification of tax treatment of intermodal containers. The bill allows U.S. companies to claim investment tax credit and accelerated depreciation on the intermodal cargo containers which they lease to shipping companies and businesses.

Also approved were H.R. 5661, a bill to amend the Internal Revenue Code of 1986 to exempt transportation on certain ferries from the excise tax on transportation of passengers by water, and H.R. 5397, a bill to amend Title 46, U.S. Code, to prohibit abandonment of barges.

Boston Whaler 22' Chosen For Pollution Control

Pier Atlantic Ltd., a marine equipment spill resource center located in Dartmouth, bought two Boston Whaler Guardian 22' center console workboats for quick response to oil spills in and around Halifax harbor. Two more Guardian 22' are to be delivered this year.

The boats, which are each powered by twin 100 hp outboards, are to be used to tow, place and maintain oil booms at the spill scene. They will also serve as utility craft to carry and deploy other equipment necessary for clean up.

Boston Whaler's Guardian 22'

Pier Atlantic Ltd. is a dedicated marine spill equipment center owned by Esso, Ultramar, Petro-Canada and Shell.

For free literature on the entire line of Boston Whaler boats,

Circle 174 on Reader Service Card

Marco Named Distributor For Pullmaster

Marco Marine Seattle, a manufacturer of deck machinery and systems for commercial fishing, has been named an authorized worldwide distributor of Pullmaster winches. With exception of sales to Washington and California, Marco will sell and service the full line of Pullmaster hydraulic planetary winches. Marco has offices and service facilities in Central and South America, Spain, Alaska and Guam.

For free literature on Marco Marine Seattle,

Circle 169 on Reader Service Card

New Brochure Describes Manifolds Cost Savings

Young & Cunningham cast construction manifolds can offer shipyards savings, and the company's services are featured in a new brochure. Most shipyards design and then either purchase or produce the main manifold piping assembly. Young & Cunningham can help cut costs because: there is no shipyard engineering or design work needed other than to establish the size, location and type of connections required; manifolds are supplied complete with valves integrally mounted; manifolds are delivered as a completed assembly, pretested and ready for use; and as the main manifold assembly incorporates the valve body and, in effect, eliminates the valve body, a much more compact manifold arrangement can be achieved.

For a free copy of the brochure from Young & Cunningham,

Circle 170 on Reader Service Card

Tracor Gets $4.5 Million Navy Contract

Tracor Applied Sciences, Inc. received a U.S. Navy contract with a potential value of $4.5 million to develop and demonstrate a neural network processor which will identify various sounds in an ocean environment. The three-year program will culminate with an operational demonstrationn of the multibeam acoustic signal detection system to the Naval Command Control and Ocean Surveillance Center, Research, Development, Test and Evaluation Division, which contracted the work.

Steinbrenner Back At American Shipbuilding

George Steinbrenner III is at the helm of American Shipbuilding, Tampa, Fla. He succeeds Admiral **Paul D. Butcher**, who passed away. Mr. **Steinbrenner**, the largest shareholder of the company, resigned as chairman and CEO in 1991 but remained chairman of the executive committee on the board.

The Meyer Werft, shipyard

GERMAN SHIPBUILDING

Challenges And Solutions In A New, Unified Industry

Shipbuilding in the newly unified Germany is in a state of transition, with the integration of east Germany posing a number of not unexpected problems for the shipbuilding sector in this reunited country. Although overall production of German shipyards rank them first in Europe and third in world shipbuilding, complications arose due to subsidy reductions for west German yards and new aid packages for east German yards. To resolve these problems, an agreement on integration was reached by German and European authorities in July.

Under the terms of the agreement reached by industry ministers of the nations within the European Community (EC), the shipyards of the new German territories will be able to receive more state aid than other EC yards, for a limited period, in return for a reduction in capacity. As outlined by the agreement, east German yards may receive operating aid in three forms: (1) The annulment of debts left over from before unification. Debts incurred under the former political system may be written off, except for 40 percent which the EC sees as corresponding to outstanding credits for stocks which still exist and could be used to build new ships after July 1, 1990; (2) An injection of fresh capital to provide enough money to modernize the east German shipbuilding production facilities; (3) Compensation for losses incurred during the restructuring period, which will last until the end of 1995. During this time, east German yards will face higher costs than their EC counterparts. The yards are expected to be less efficient than other EC yards, and will be involved in the difficult process of streamlining operations.

These three elements combined will constitute a maximum of 36 percent of shipbuilding turnover in the new Federal states as "reconstructed" as though the yards were operating at average EC levels of efficiency after the restructuring period (based on a formula of the number of workers, multiplied by the average annual output of an EC shipyard worker). Aid distribution is 35.7 percent for Meeres-Technik-Wismar GmbH (MTW); 35.8 percent for Warnow-Werft GmbH; and 23.9 percent for Peene-Werft GmbH. These three yards are expected to be sold to west German (Meeres-Technik-Wismar GmbH and DMR to Bremer Vulkan AG; Peene-Werft GmbH to the Hegemann Group) and Norwegian companies (Warnow-Werft GmbH to the Kvaerner Group), and the aid levels will apply to these and the remaining unsold yards. Aid payments will cease after the end of 1993.

In return, capacity will have to be cut by 40 percent by the end of 1995, based on July 1, 1990 capacity levels. This will incur job losses totaling about 25,000 since German unification. The current work force of the main yards has been reduced from around 40,000 before July 1, 1990 to about 21,000 employees, and will decrease further to about 15,000 in 1995. This will involve 7,580 workers from the new ship construction sector. The cuts will be permanent.

The political agreement is broadly in line with the EC's original proposal. It marks a compromise between those member states, which sought tougher capacity cuts, and Germany, which wanted less severe reduction requirements. The EC explained that its proposal was a fair and balanced package accommodating the unusually severe economic and social problems facing the new Federal States as they adapt to EC competition, and the extreme sensitivity of this sector in other EC nations where aid can have a serious effect on competing shipyards.

The maximum aid of 36 percent will not be directly applied to lower sales prices of current contracts and future projects.

This concerned some shipyards in west Germany and other EC nations. Several additions were made to the original part of the text of the agreement to reassure other shipbuilding countries that the aid will neither spill over into west German yards nor will it be used to undercut other EC yards bidding for the same contract.

This takes the form of a declaration stating that "the Commission will ensure that this aid does not affect trading conditions to an extent contrary to the common interest," backed up by a statement in

the agreement saying that "in cases where shipyards in east Germany are competing for the same contracts with yards of other EC states and where there is no substantiated competition from third countries, member states may refer the matter to the Commission if they believe the price quoted is unduly low as a result of the aid granted.

The Commission will examine such cases in the light of the principles underlying the latest directive and may require the price to be increased up to a maximum corresponding to the lowest prices offered by shipyards in the other concerned member states."

The recent Bremer Vulkan contract is a good example of the how this new system of control works.

Bremer Vulkan (BV) booked an order from Chinese shipowner China Ocean Shipping Company (COSCO) for four large 3,850-TEU containerships.

Two of these newbuildings were earmarked for construction under special financial terms at MTW, which BV was going to purchase. The remaining two vessels in the order were going to be split between BV and HDW. However, the deal was halted by the EC on the grounds that the inclusion of special financing terms for China as an underdeveloped country exceeded those granted by other European countries. It is now unclear whether German and European yards will be able to retain this order.

German Shipbuilding: Third In World, First In Europe

During 1991, German shipyards delivered a total of 106 oceangoing vessels aggregating 928,147 gross tons or 1,056,287 compensated gross tons (cgt), with a value of $2.91 billion.

Shipyards in the former Federal Republic of Germany produced 669,000 cgt, while those in the former German Democratic Republic had an output of 387,000 cgt. In prior years, deliveries by east German yards were substantially higher, averaging about 600,000 cgt annually, for the most part due to large ship orders from the former Soviet Union.

However, in the wake of the political changes, most of these Soviet orders have been lost. During unification, the capacity of east German yards was set at 545,041 cgt. Now, under the EC agreement, this capacity will be reduced 40 percent to 327,000 cgt.

As previously mentioned, the integration of east German shipyards into the existing shipbuilding industry base under a normal market economy was the main task of the German shipbuilding industry in 1991.

This integration is still under way. "We have now reached a fascinating challenge," said **Dr. F. Hennemann,** chairman of the board of Bremer Vulkan AG, a company set to take over some of the east German yards or companies of the former combined shipbuilding group.

In order to make privately held east German companies, the organization Treuhandanstalt was founded. This organization also handled the privatization of the companies within the former combined shipbuilding group, Kombinat Schiffbau, which includes all the shipyards and some the equipment supplying firms.

As of now, MTW of Wismar, Warnow-Werft, Peene-Werft of Wolgast and Dieselmotorenwerk Rostock (DMR) have found private partners.

The goal of the Treuhandanstalt is to find private partners for all the remaining companies and shipyards within the former combined shipbuilding group, as well as to facilitate restructuring as long as no buyers have been found for the facilities.

Today, Germany is one of the leading shipbuilding nations. With a market share of around 5 percent German shipbuilders rank, behind Japan (45 percent) and South Korea (22 percent), third in the world and first in Europe.

Since Germany, for the most part, is not producing large volume vessels like tankers and bulkers, its market share in specialized vessels is high.

German shipbuilding technology is recognized as being some of the most advanced in the world, with

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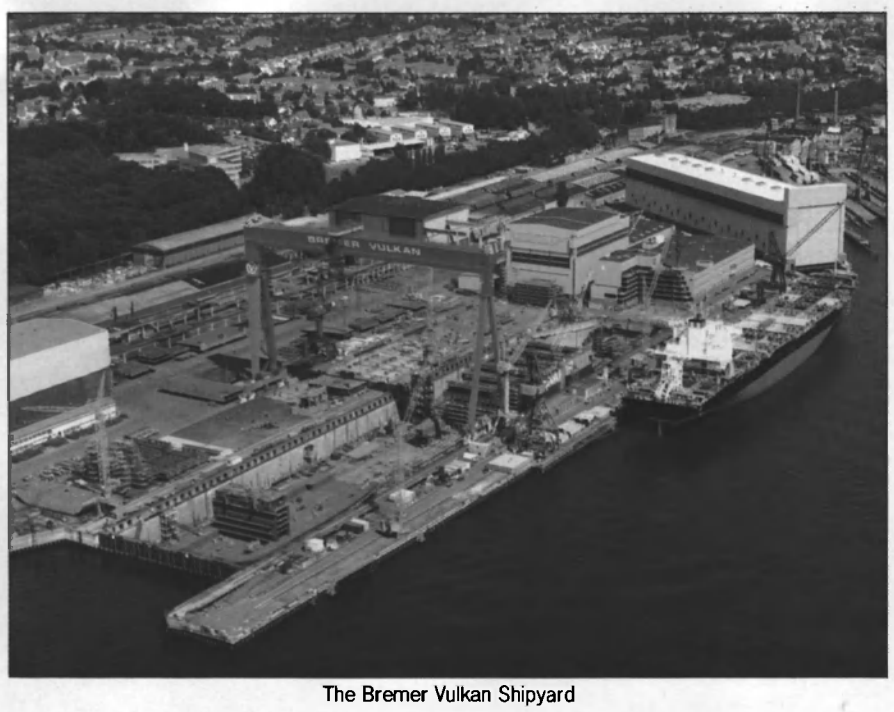


The Bremer Vulkan Shipyard

TABLE 1

Capacity & Workforce — East German Shipyards New Construction Of Commercial Ocean-Going Vessels

Yard	Capacity GT 1/7/1990	Capacity GT Till 1995	Employees in Newbuilding 1/7/1990	End 1991	End 1995
Meeres-Technik-Wismar GmbH (MTW)	87,275	100,000	4,181	2,532	1,790
Warnow-Werft GmbH (WW)	133,804	85,000	3,876	3,304	1,875
Peene-Werft GmbH (PW)	–	35,000	86	1,396	770
Neptun-Werft	97,042	–	3,798	–	–
Volkswerft Stralsund GmbH	183,030	110,000	5,445	3,467	2,275
Elbewerft Boizenburg GmbH	38,228	35,000	1,249	930	540
Rosslauer Schiffswerft GmbH	5,662	?	882	586	330
TOTAL	**545,041**	**365,000**	**19,517**	**12,205**	**7,580**

(MTW) Former Mathias-Thesen-Werft, to be taken over by Bremer Vulkan AG.
(WW) Without Neptun-Werft, to be taken over by Norwegian Kvaerner Group.
(PW) Former naval yard without any production in merchant marine ships, therefore no counted capacity before 1/7/1990.

the "Ship of the Future" concept being a key example of this state-of-the-art technology.

It was developed within the last 10 years and, through the use of a high degree of automation, has allowed crew size to be reduced from an average of 30 to as little as 12. For example the new double-hull Lindenau Tanker Class 2000, designed by Kiel-based shipbuilder Lindenau Werft, features extensive use of remote control and management systems-such as remote controlled cargo and ballast valves, a tank radar content measurement system for all cargo tanks and a pneumatic content display for all ballast, fuel oil, storage and drinking water-which enable the ship to be operated by a crew of 11.

Additionally, expertise in a number of high-tech marine fields has also helped to enhance the status of German shipbuilding on the international market.

Super Panamax Boxship Development

The focal point of German shipbuilding is the design, construction and conversion of sophisticated specialized vessels.

Approximately 80 percent of the newbuilding volume consists of specialized vessels. For instance, German designers have introduced the Super Panamax container vessel with a capacity of more than 4,400 TEUs. The first ships of this new type were placed in service in late 1991 by Hapag-Lloyd AG.

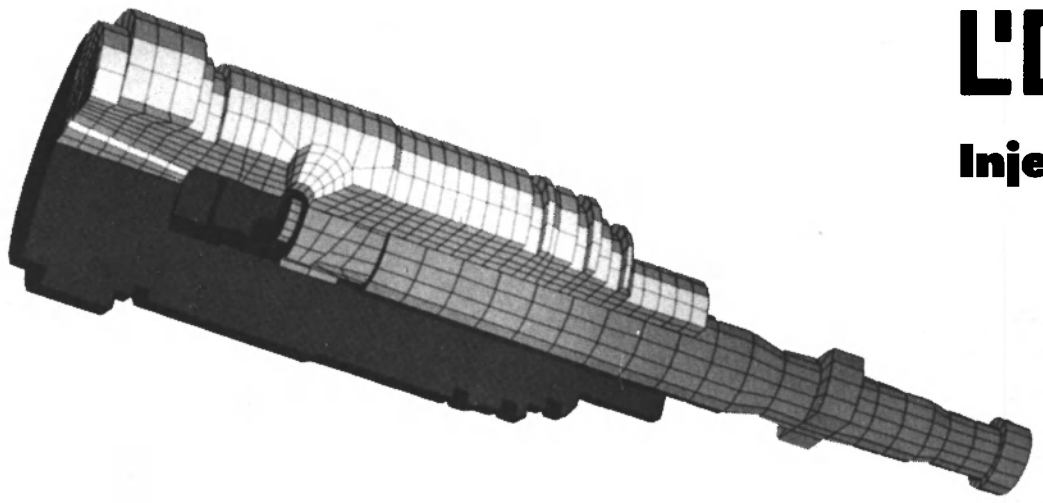
One special feature of these vessels is the ability to stow 11 rows of containers side-by-side in the hold. Previously with a Panamax breadth of 32.2 meters (about 106 feet), it was possible to stow only 10 containers side by side, resulting in a capacity loss of at least 500 TEU. This special design was made possible by the use of special high tensile strength steel in the upper girder of the hull permitting a nearly 85 percent open deck.

German shipbuilders have been in the forefront of the development of containerships since they revolutionized ocean transport decades ago.

With its development, ship transport and its technical aspects were dramatically transformed into a combined land-sea transport system.

The first generations of containerships carried the mark of innovative German ship design and construction. Nearly all of the larger German yards, namely BV, Blohm + Voss, HDW, FSG, Flender Werft, and TNSW, have been involved in this development and they are still actively optimizing today's generation of container vessels.

German shipyards are spread along the coastlines of the North and Baltic Seas. The centers of German shipbuilding are, from west



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Injection Systems

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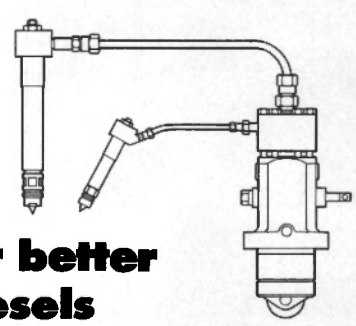
L'Orange injection: the heart of the driving force

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.



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to east—Emden, Papenburg, Oldenburg, Bremerhaven, Bremen, Cuxhaven, Hamburg, Husum, Flensburg, Kiel, Lubeck, Wismar, Rostock, Warnewunde, Straslund and Wolgast.

Shipbuilding is a major part of the industry in the northern and eastern parts of Germany. Shipyards are important factors in regional affairs.

Based on tonnage, roughly one-third of Germany's new ship construction was produced in east Germany during 1991.

The present order backlog will provide production for about 15 months. The main type of ship produced by the yards is still the container vessel, followed by general cargo vessels and passenger-carrying ships, as well as small special tankers. Since 1975, the peak year in ship production, German shipyards have reduced their output more than 50 percent.

Elimination Of Subsidies By 1995

The German Shipbuilding and Ocean Industry Association (Verband fur Schiffbau und Meerestechnik or VSM) promotes the economic interests of its member companies.

VSM is a federation of about 150 enterprises, among which there are 46 shipyards that build or repair seagoing vessels and 70 companies involved in the design, construction and service of ships, marine equipment and ocean technology. The work of the association concentrates on activities related to economic policy and on diverse services for its members towards both the public and official authorities.

Part of VSM's goals have been to strive for fair conditions of competition in international shipbuilding. The association is a member of the Committee of EEC Shipbuilders Association (CESA) and of the Association of West European Shipbuilders (AWES).

VSM welcomed the agreement on the integration of east German shipyards, but criticized Bonn economics minister **Jurgen Mollemann** for failing to provide west German yards with assistance. Their subsidies are to be cut from the present level of 9.5 percent to 7.5 percent, and will end in 1995.

The competitiveness of German shipyards has been burdened by increasing costs and by the development of exchange rates. In 1991, tariff wages for west German yards increased by 6.7 percent and an additional 5.8 percent in 1992.

As of April 1, 1991, the wage costs of east Germany were fixed at 60 percent of western levels; it will be adjusted to the western level over the next three years.

Shipyards in east Germany seem to be better off now, with the promise of subsidies and modernization funding being fulfilled.

Raising Productivity

West German yards do not want to be outbid by east German yards on a cost basis. They do not believe in the control function of the EC commission. Some of the larger shipyards believe that their only chance of remaining competitive is through raising their productivity. How are they going to do it?

Bremer Vulkan has begun to modernize its production flow and has almost completed a new 3,800-ton-capacity ship-lift, enabling the yard to produce aft ship sections ashore in one module and then to move it to the building dock.

HDW in Kiel created a plan for the "Yard 2000," which includes modernizing the entire yard by installing panel lines, welding robots and nearly CIM-guided computer system.

HDW plans to go to "lean production," with a small crew of operators and high rate of premium quality steel output.

Modern shipyards have to first cut and then piece together single sections automatically. This means single sections have to be standardized and minimized in quantity. Cutting and welding should be performed only on one side of the steel plate. To improve quality, production tolerances for these big sections must be zero. However, this is easier said then done. Fully automated welding, only from one side and in the overhead position, also needs to be implemented in the near future. Many of the yards believe that new laser cutting and welding technologies may provide part of the solu-

tion. Because subsidies won't be available, German shipyards believe that they must focus on productivity to remain competitive.

As in most other European countries, the number of concerns about building large, slow-running crosshead engines has been reduced drastically in recent years. Bremer Vulkan has the only surviving engine works of the once traditional style, within its associated shipyard. With a license from MAN of Augsburg dating from the earliest days of the marine diesel engine, they changed to the uniflow-scavenging Copenhagen design following the acquisition of Burmeister & Wain by MAN in the late 1970s. Until recently, all subsequent production has been of these, re-styled MAN B&W models. The engines are supplied, not only for ships built by Bremer Vulkan, but to other yards mainly in Germany. The factory has been working through an important order for 10 29,470bhp 7L80MC engines for a series of large container ships originally ordered by the Soviet Union and shared between the BV and HDW yards. The ships are of a popular size and incorporate a number of "Ship of the Future" features, and have all been taken up on charter.

Latterly Bremer Vulkan became joint majority purchasers, with Dieselmotoren Rostock (DMR) and Fincantieri of Italy, of the diesel engine activities of Sulzer Bros. and, as co-proprietors of New Sulzer Diesel, commenced the manufacture of the latest two-series Sulzer RTA engines. Two 16,440bhp 6RTA72 examples have been delivered and four more are on hand for container ships ordered from three German yards, including BV, by DSR Lines of the former German Democratic Republic. Dieselmotoren Rostock commenced building crosshead engines to the original MAN design, but changed to Sulzer in 1989 when orders were received from domestic DDR yards for RTA58 engines to power Soviet Ro-Lo and Dutch and German container ships. Recent developments follow the merger of the two Germanys and co-proprietorship of New Sulzer Diesel, and the latest DMR sales brochure implies an increase in manufacturing capacity, and the eventual availability of DMR-Sulzer engines in the full size range from RTA 38 to RTA84M. DMR has concluded a license agreement with Mitsubishi Heavy Industries, permitting them to build the range of Mitsubishi VE engines which are making an impression in certain areas of the European market, but so far entirely in the form of imports from Japan.

DMR enjoys the connection of an in-house reduction gear factory and two subsidiary propeller makers; Wismarer Propeller und Maschinenbau, making controllable-pitch propellers, thrusters, shafting and stern glands; and Mecklenburger Matallguss, casting and machining fixed-pitch propellers up to 6.5m diameter and 25 tons finished weight. Mecklenburg, incidentally, has a technical cooperation agreement with noted propeller manufacturers, Ostermann of Cologne.

Germany has been the stronghold of the medium-speed diesel engine since the 1950s, as it can claim having the greatest number of manufacturers in Europe, building ranges of engines of their own modern designs, constantly uprating them and introducing new models.

MAN B&W, who reported record turnover, market share and profit figures for the fiscal year 1991/92, have enjoyed success with its latest

Container/Reefer vessel "Cap Finisterre" from Flender Werft

series of three geometrically-similar models: L58/64, L48/60 and L40/54, all constructed with from six to nine cylinders in-line. Last year a Vee-form version of the 48/60 model was added to the range. The largest L58/64 engines have found their most important application for the propulsion, in multi-engine geared diesel or diesel-electric configuration, of large cruising ships. While the most significant installation, in the nine-unit 13,000 hp steam turbine-to-diesel-electric conversion of the QE2, took place within 179 days during the winter and spring of 1986/87, the same principle, on a lesser scale, has since been followed in three large new-construction ships of the P&O Cruises fleet, and the NYK-owned Crystal Harmony.

Another, with two engines in twin-geared arrangement powers the Japanese-owned Asuka, while a long series of Norwegian reefer ships have a single-geared engine. With continuous maximum and economy ratings of 1,890 and 1,215 bhp at 428rpm, this engine model has an extremely wide potential market, quite apart from its application for shoreside power generation.

While the recently introduced 12V48/60 engine, built under the joint production program of MAN and MTU with SEMT-Pielstick, was initially targeting the stationary engine market, it could be foreseen as a "father" engine (in so-called father and son installations, with an in-line version as the junior partner in each drive line), utilized for smaller cruise ships and large ferries which have different day and night operating regimes.

At SMM, MAN B&W is introducing a six-cylinder example of a new smaller engine range, the L/V32/40 of 600 bhp per cylinder at 750 rpm. This engine is an example of the trend towards longer piston strokes, to both improve fuel consumption and ably digest poorer-quality fuels. The output for the new engine is 50 bhp per cylinder, nine percent more than that of the former 32/36 series.

During the past year Krupp-MaK presented a new smaller engine design, the M20. This may mark a new generation of engines from Kiel, although the larger engines in the current range, extending up to the 1,515 bhp per cylinder at 425 rmp M601C models, are selling well.

The 200mm bore by 300mm piston stroke M20 will be built with six, eight and nine cylinders in-line and 12 and 16 cylinders in Vee-form, to cover a range of powers from 1,260 to 3,585 bhp at up to 1,100 rpm.

Of some interest is that the engine has been designed for joint manufacture by SKL of Magdeburg, makers of medium-speed engines and with a strong market presence in the former Eastern bloc countries. SKL will provide the frame castings, of a robust and readily-machined near rectangular section. The crankshaft is underslung, a fundamental design change for MaK engines, and special attention has been paid to both cylinder liner and head cooling. Deutz MWM introduced a new middle-weight (330 x 450mm) engine, the M 645, which, at 578bhp per cylinder at 600 rpm, fills the gap between the robust and popular M 628 series and the largest M 640. Common to all recent engine designs are the attention paid to extending the life of piston rings, cylinder liners, exhaust valves and bearings; and to providing access for inspection and maintenance without the need to dismantle surrounding components.

Following a year's successful service with the prototype 12 V 595 engine under the severe and intense operating conditions of a Baltic train ferry, MTU have commenced series production of this range of high performance engines. Applications for orders received include a fast private yacht, a police border patrol vessel and a super-ferry. The patrol vessel is the conversion of a former Parchim-class missile-armed craft of the former East German Navy.

The machinery, consisting of three complex and difficult to maintain Soviet 54 cylinder radial engines, is being replaced by two MTU 12 V 595 TE90 engines of 4,400 bhp each, with ZF reverse-reduction gearboxes. The 40-knot passenger and car super ferry Aquastrada will be equipped with two 16-cylinder 595 TE70 engines of 4,850 bhp driving the wing water jets and a 28,000 hp MTU-GE2500 gas turbine powering the center one.

The larger 956 and 1163 series of MTU engines continue to be a fist choice for the propulsion of all-die-

TABLE 4

Vessel Types Produced By German Shipyards In 1991

Type of Vessel	No.	GT	%	Capacity GT	%
General Cargo V.	43	281,011	30.3	337,538	32.0
Container V.	22	426,092	45.9	340,037	32.2
Ferry/Ro-Ro/Passenger V.	12	82,955	8.9	153,823	14.6
Gas/Chemical Product Tanker	8	84,041	9.1	100,923	9.6
Fishery Vessel	6	46,590	5.0	93,180	8.8
Tug	4	1,099	0.1	5,495	0.5
Offshore Units	7	5,823	0.6	22,611	2.1
Other Ships	4	536	0.1	2,680	0.2
TOTAL	106	928,147	100.0	1,056,287	100.0

TABLE 3

Deliveries & Contracts – German Yards

Year	Deliveries No. of Ships	Deliveries 1,000 GRT/GT	Orders No. of Ships	Orders 1,000 GRT/GT
1975	192	2,330	307	4,474
1980	118	406	122	953
1985	136	448 /646	115	715 /851
1986	85	444 /539	68	654 /707
1987	67	344	59	814
1988	59	528	93	938
1989	58	476	117	1,094
1990*	85 (33)	618 (163)	120 (100)	1,472 (750)
1991	106	928	160	1,624
1/1992	18	207	191	1,617

*East Germany added in 1990 (in brackets) and included in 1991 and 1992 statistics.

Source: VSM statistics

TABLE 2

Ocean-Going Ships Completed Worldwide By The Ten Leading Countries

Country	1989 No.	1989 GT	1990 No.	1990 GT	1991 No.	1991 GT	Position %	Position No.
Japan	640	5,364,600	633	6,824,119	602	7,282,756	45.2	1
Korea	102	3,101,566	110	3,459,786	112	3,496,693	21.7	2
Germany	87	718,030	97	856,071	82	774,502	4.8	3
Taiwan	9	404,892	10	667,220	11	513,764	3.2	4
Italy	35	327,202	27	371,810	28	499,896	3.1	5
Denmark	33	342,960	29	394,677	27	441,586	2.7	6
Yugoslavia	26	498,716	25	456,853	22	355,173	2.2	7
Spain	130	230,906	97	363,100	59	317,422	2.0	8
Netherlands	53	88,814	65	163,293	84	210,837	1.3	9
Poland	44	199,391	34	103,580	47	193,842	1.2	10
Others	434	1,959,092	545	2,224,866	500	2,008,634	12.6	
WORLD	1,593	13,236,169	1,672	15,885,375	1,574	16,095,105	100.0	

Source: Lloyd's Register of Shipping

sel frigates and as the "D" mode of those with combined diesel and gas turbine (CODAG) machinery.

Meanwhile the compact 396-type engines, running at 2,100 rpm for short-time outputs of up to 3,480 bhp, dominate the market for fast catamarans and dynamically-supported craft. SKL Moteren- und Systemtechnik AG of Magdeburg is another engine-builder exhibiting a longer-stroke version of an established design; in this case their VDS 29/24 AL-1, super ceding the VD 24/24 series. The agreement with Krupp-MaK, which is noted above, is most likely to lead to further cooperation in design and manufacture.

Maschinenbau Halberstadt GmbH supplies a range of models up to the VD 42/48 AL-2 of 8,200 hp from the 12-cylinder version, the only larger engine designed and built in the former DDR. Twin-geared in-line versions power a class of Baltic train ferries. Arrangements made for the part manufacture and assemble of a number of MAN B&W 40/54 engines may lead to closer cooperation between the two companies. The principal business of gear-makers Renk Tacke is the supply of reduction and combining transmissions for ferries and Ro-Ro vessels powered by medium-speed engines; also generator power take-offs with and without speed compensating mechanisms.

The Augsburg factory specializes in the compact, lightweight and highly-rated gears for frigates and destroyers. Among recent unusual orders are those for the three gas turbine/water jet drives in the trans-atlantic record challenger Destriero, and a transmission to provide concentric opposite rotation from a large slow-speed diesel engine for the most powerful contra-rotating propeller. This is for Mitsubishi, who will install it in a VLCC.

The addition of an electronically-controlled slipping clutch system, ADS, fitted to a reduction gearbox made by Eisenwerke Reintjes GmbH has overcome a major problem encountered in fast craft propelled by high-speed diesel engines.

Maneuvering to enter or leave a berth in a confined harbor is a tricky operation. Such engines can seldom be set to run at speeds which allow a slow approach, and the procedure becomes one of rapid ahead-and-astern movements.

The Reintjes ADS system, when selected, controls the pressure applied to the multi-plate clutches so that, for instance with the engine set to its comfortable idling speed, the propeller can be driven, both ahead and astern at speeds corresponding to a turn-down of as much as eight to one below the constant ratio of the gear mesh. Four Reintjes WVS 2232 reverse-reduction gears fitted with ADS and each associated with a P2, 500 hp Paxman engine are fitted in the large series of fast patrol boats which Bollinger has been supplying the U.S. Navy.

Coast Guard Issues Interim Double Hull Requirements

The Coast Guard is adopting standards for double hulls on vessels carrying oil in bulk as cargo or cargo residue that are constructed or undergo a major conversion under contracts awarded on June 30, 1990 or later. The Coast Guard is also issuing standards for double hulls on vessels carrying oil in bulk as cargo or cargo residue that have been constructed or have undergone a major conversion under earlier contracts. OPA mandates that these vessels have double hulls according to a timetable commencing in 1995.

The action provides the maritime industry with interim standards to meet the double hull requirment.

The interim final rule is effective Sept. 11, 1992. Comments should go to the Executive Secretary, Marine Safety Council, (G-LRA/3406) (CGD 90-051), Coast Guard Headquarters, 2100 Second St., SW, Washington, D.C. 20593-0001.

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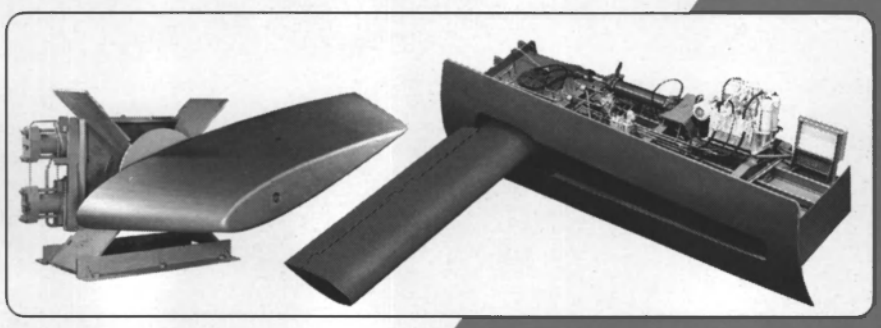
- Suitable for retrofit



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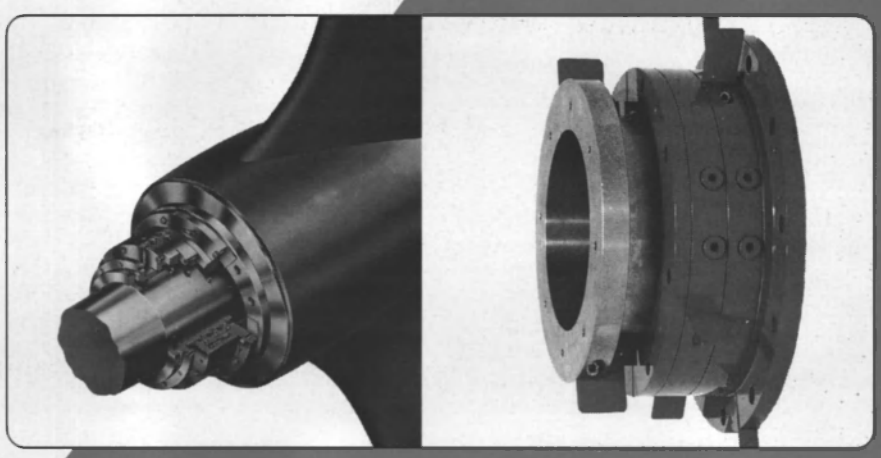

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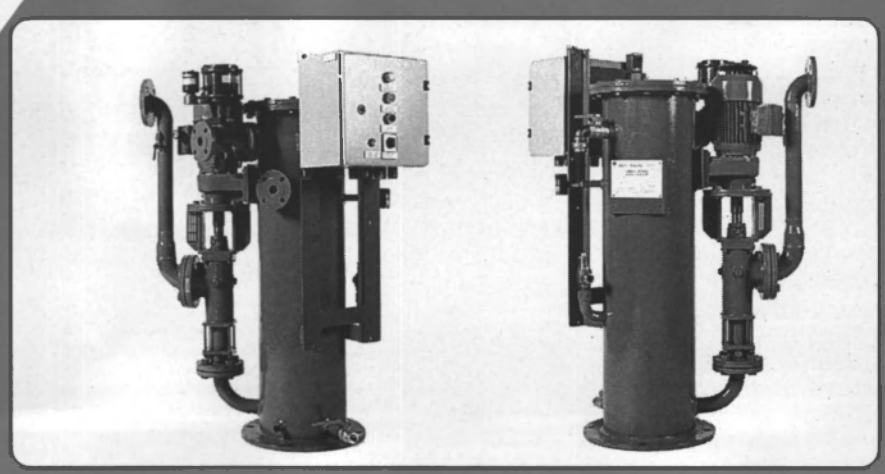

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North Sea Companies Link For Computer Venture

Sun Oil, Enterprise, LASMO and Ultramar have linked forces and, together with EDS-Scion, created a new computerized system which could set a standard for North Sea offshore material management.

After determining current existing computer packages failed to meet the consortium's requirements, the group tapped the UK information technology services leader EDS-Scion to develop and successfully install IMPALA, or Inventory Management, Purchasing and Logistics Administration. The new system is an upgrade of Sun Oil's STOC II system, in operation in the North Sea since 1985.

With IMPALA, the companies will have the capability to manage multiple platforms and warehouse operations while minimizing inventory levels, analyze supplier performance, reduce paperwork and improve material usage. The IMPALA system provides a visible audit trail so users may track materials movements, allowing for better management of resources.

Additionally, certification requirements for safety-related items are automatically posted to purchase orders and staff are prior alerted to hazardous materials receipt. The system can also produce all manifest and supporting documentation, for movement of material by road sea and air. Future additions to the IMPALA program scheduled for implementation this year include the ability to manage rented equipment, service orders, pre-receipt processing and buyer allocation.

Daewoo Gets $94 Million Ship Order

Daewoo Shipbuilding & Heavy Industries has received an order to build three modern bulk carriers of the 70,000 ton class from Czechoslovakian Ocean Shipping (COSI).

The contract price was reported to be approximately $32 million per ship with delivery scheduled from the Okpo shipyard between late next year and early 1994.

FMC Authority Hinges On Legislative Compromise

The Federal Maritime Commission (FMC) may gain new power to combat foreign shipyard subsidies should a compromise on proposed legislation be reached. The compromise between U.S. shipyards and ocean carriers would resolve industry and congressional concerns with the approach taken in the Bush administration maritime policy package.

But considering the testimony presented at the House Merchant Marine and Fisheries Committee's hearings on the comprehensive policy proposal, there is still much work to be accomplished. The legislative plan presented by Transportation Secretary **Andrew Card Jr.** features a new subsidy for operators that enroll their ships in a seven-year defense requisition program.

However, some U.S. shipbuilders and committee members criticized the plan for being too narrowly centered on the problems encountered by vessel operators. Also at question is the feasibility of solely prohibiting U.S. carriers from receiving ships from countries which are found to be overly subsidized, while other carriers may continue to do so.

First Commercial Canadian Offshore Oil Project Begins Production

Canada recently began production at its first commercial offshore oil project, called the Cohasset Project. The Cohasset Project is located about 205 miles southeast of Halifax, Nova Scotia, and is operated by LASMO Nova Scotia. At the start about 14,000 barrels of oil were produced each day and the rate is expected to increase with the addition of more wells. The Cohasset and Panuke oil fields make up the project.

At the present time it is reported that the jack-up platform Rowan Goilla III, a combination drilling and production facility is located in the Panuke field for the 1992 production season and will be moved to the Cohasset site in 1993.

China Asks Foreign Bids For China Sea Exploration

East China Offshore Oil Corp. of Hong Kong is now asking for foreign bids for exploration of the East China Sea. The two areas up for bid encompass 28,000 square miles in the northern and southern part of the East China Sea, and represents the last offshore area to be opened.

Oil and gas produced in the East China Sea area will be supplied to the company's headquarters in Shanghai, said **Ma Qifu**, general manager. As a part of the deal, the company is promising to provide good telecommunications, as well as office and living facilities for workers.

Earlier in 1992, Amoco Corp.'s Orient Petroleum Co. unit signed a 30-year deal with China National Oil Development Corp. for exploration and development rights in the onshore, central Anhui province. It has been acknowledged by senior oil industry officials that no one country could develop the sphere alone.

Japan Ministry Calls For Added Shipbuilding Funds

Japan's Ministry of Transport is pushing for additional funds for the government's shipbuilding loan program, and shipping executives estimate an additional $160 million of subsidies in the form of low-interest loans would be needed from the Japan Development Bank.

Yoshinori Asami, director-general of the ministry's Maritime Transport Bureau, said the new funding is needed in addition to the current fiscal-year budget amount of $360 million for new buildings and modernizing of the nation's merchant fleet.

Other officials claimed that the ministry, specifically, plans to increase its subsidies for construction of vessels designed to transport Japanese automobiles in the nation's coastal waters. The Maritime Credit Corp. is expected to finance up to 80 percent of building costs for the vessels starting in the fiscal year 1993, versus its current 70 percent level of support. To help Maritime Credit achieve this goal, officials have said the corporation will receive larger subsidy allocations.

Lloyd Brasileiro Ship Auction Blocked

Companhia de Navegacao Lloyd Brasileiro, the Brazilian state-owned cargo carrier, can not auction four of its ships a judge in Rio de Janeiro ruled. The injunction was the result of a petition by **Roberto Roque Viera**, attorney for the national maritime officers union, who claimed the sale would in effect liquidate Brazil's third largest public fleet. A transport ministry analysis which recommended the option to liquidate the fleet has been rejected, and the liner operator has been ordered to present a reorganization and sale to public interests plan. Currently the government holds 99.6 percent of the stock.

New Service Offered By Inland River Logistics

A new transport service offered by Inland River Logistics Inc. of New Orleans is the coordination of logistics for the transport of dry bulk and general cargo to inland destinations by contracting and selecting the best available barge and terminal. The company already offers shippers transport services including package rates that include stevedoring and transport of bulk and general goods.

Humboldt To Manufacture Mini Sport Boats

Humboldt Marine Services, Inc., a small boat-building and repair yard in northern California, has added to its combined service and product line the manufacture of small, quick, mini sport boats to capture a share of the personal watercraft market.

For more information on Humboldt Marine Services, Inc.,

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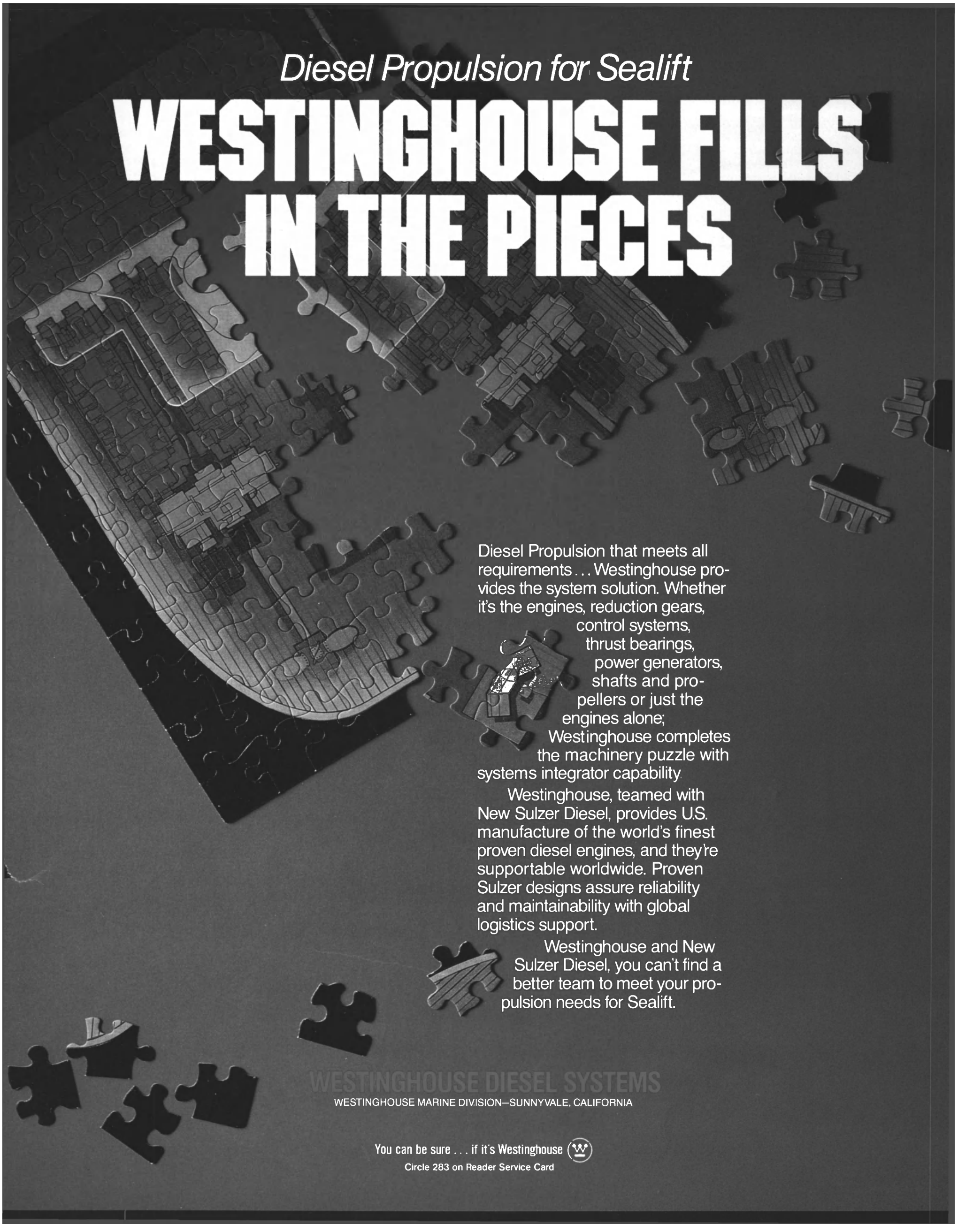

Diesel Propulsion for Sealift

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Diesel Propulsion that meets all requirements . . . Westinghouse provides the system solution. Whether it's the engines, reduction gears, control systems, thrust bearings, power generators, shafts and propellers or just the engines alone; Westinghouse completes the machinery puzzle with systems integrator capability.

Westinghouse, teamed with New Sulzer Diesel, provides U.S. manufacture of the world's finest proven diesel engines, and they're supportable worldwide. Proven Sulzer designs assure reliability and maintainability with global logistics support.

Westinghouse and New Sulzer Diesel, you can't find a better team to meet your propulsion needs for Sealift.

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WESTINGHOUSE MARINE DIVISION—SUNNYVALE, CALIFORNIA

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Model 9821 MariStar-M installed aboard a small yacht is ideal for large and small vessels

Scientific-Atlanta Introduces New Inmarsat-M Terminal

Scientific-Atlanta, Inc., has formed a new business unit which will market the recently introduced Model 9821 MariStar-M™, the company's most advanced mobile satellite communications terminal and one of the first to support the new Inmarsat Standard M digital service.

"Our new terminal, in conjunction with Inmarsat's Standard M service, will help to greatly expand the market for mobile satellite communications," said **Faris Gaffney**, vice president and general manager of mobile satellite communications for Scientific Atlanta's Network Systems Group. "Currently, mobile communications by satellite is practical only for a large oceangoing fleet. With this new service, even small yacht owners can make use of satellite communications."

The Model 9821 is Scientific-Atlanta's marine version of the Standard M terminal. It is also one of the first Standard M terminals to be introduced. Future Standard M products from Scientific-Atlanta will be developed for land mobile and briefcase transportable applications. Inmarsat Standard M service is expected to come on-line in the near future.

The new Standard M antenna is less than one fourth the size and weight of the Standard A. It weighs less than 40 pounds and is 24 inches in diameter, making it ideal for any vessel 50 feet or longer.

The new product consists of the lightweight outdoor antenna and a small indoor electronics unit, about the size of a VCR. This small indoor unit allows greater flexibility and ease of installation in smaller spaces aboard ship.

Some of the standard features of the Model 9821 MariStar-M include:

* Voice communications interconnect through the public switched network to any phone worldwide.

* Worldwide fax connectivity at 2,400 bits per second (bps).

* Data port for interactive communication or messaging at 2,400 bps.

* NMEA-0183 navigation interface for interconnection with other marine navigation instruments.

* Front-panel distress button that automatically routes the distress signal through the Inmarsat network to the appropriate rescue source.

Options for the Model 9821 include:

Scientific-Atlanta's new Model 9821 MariStar-M satellite communications antenna

* Internal GPS (Global Positioning System) for navigation and rescue.

* Battery backup to enable operation in case of main power outage.

* Printer for automatic call and alarm logging.

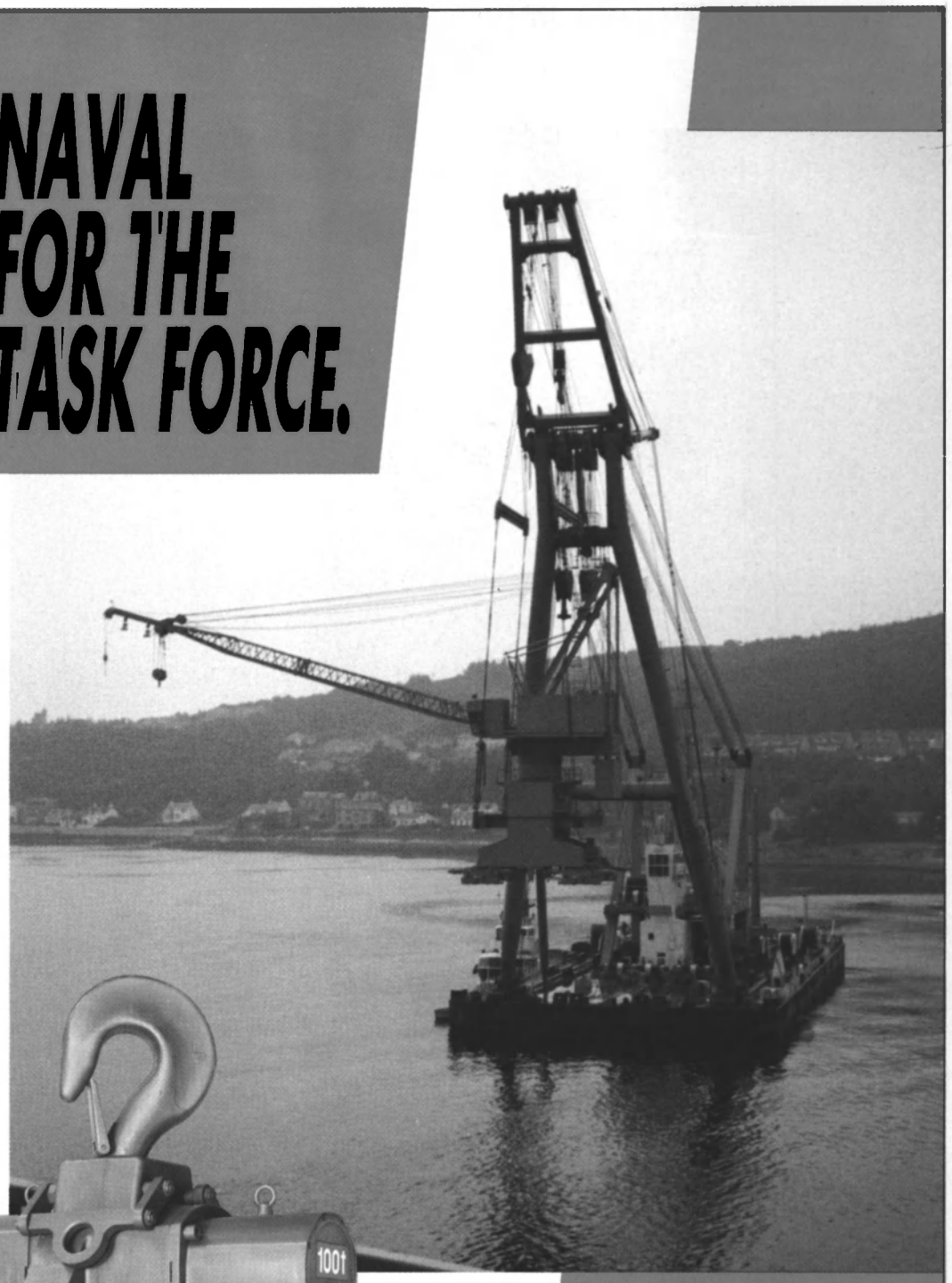
* An external announcer or buzzer to announce incoming calls throughout the vessel.

Scientific-Atlanta designs, manufactures, installs and maintains satellite communications and cable television systems, and has provided 45,000 earth station systems to 130 countries.

For free literature describing the new Model 9821 MariStar-M mobile satellite communications terminal,

Circle 133 on Reader Service Card

'A SUCCESSFUL NAVAL ENGAGEMENT FOR THE J.D. NEUHAUS TASK FORCE.



When the U.S. Navy sent a S.O.S. to help move this giant crane, we dispatched two of our JDN PROFI 100 ton pneumatic hoists. The results was a complete victory for us both.

Saving the day for our customers is always satisfying, but for JDN it's not new. Our hoists have been solving weighty problems in more than 90 countries all over the world.

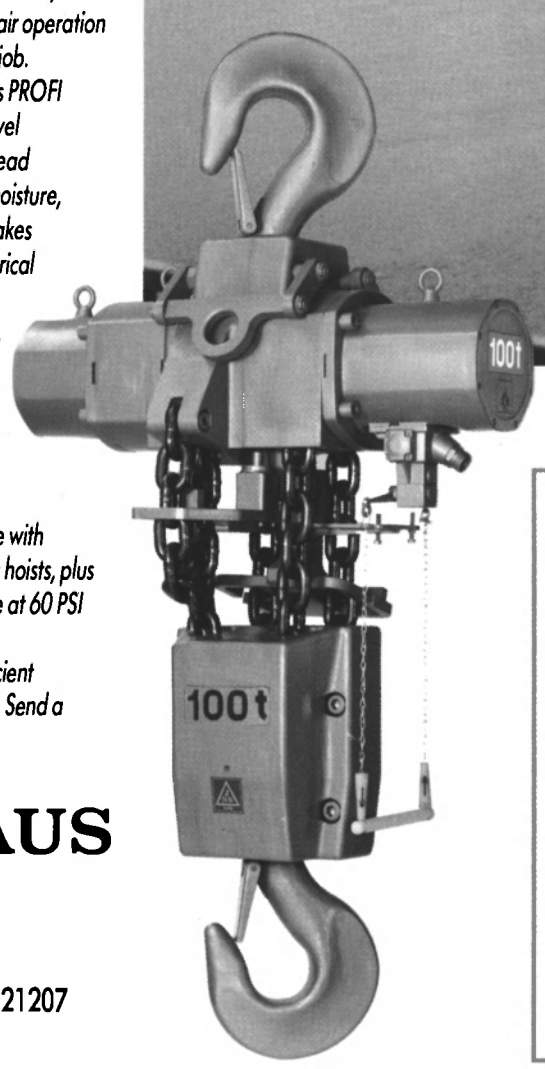
In this case the 100 ton pneumatic hoists were used on site to level these 310 ton cranes. Incredible size and capacity ratio, precision engineering and construction, and their dependability on only 85 PSI compressed air operation made the JDN PROFI the perfect choice for the job.

But this hoist, and the rest of the world famous PROFI series, can operate at the same performance level mounted overhead on trolleys and in low overhead situations. They are unaffected by dampness, moisture, steam or heat, and the pneumatic operation makes them ideal for situations where sparks and electrical problems cannot be tolerated.

The ultra sensitive, pull cord speed regulation, built into every PROFI hoist, was key to this precision Navy operation. The ability of the hoists to be left running indefinitely without damage adds to the exceptional versatility of the PROFI Line.

The J.D. Neuhaus Corporation offers a full line with capacities from 500 lbs. to 100 tons, pneumatic hoists, plus a wide variety of trolleys and hoists that operate at 60 PSI or hydraulic power.

For your next impossible challenge, or for efficient everyday operation, do what the U.S. Navy did. Send a S.O.S. to J.D. Neuhaus Corporation.



DEPARTMENT OF THE NAVY
CHARLESTON NAVAL SHIPYARD
NAVAL BASE
CHARLESTON, S.C. 29408-6100

AFDB-7/9200
Ser 212/1114
18 November 1987

From: Commander, Charleston Naval Shipyard
To: J.D. NEUHAUS, Baltimore, MD 21207

Subj: DELIVERY OF TWO 100 TON PNEUMATIC OPERATED CHAIN HOISTS ON CONTRACT N00612-87-T531

Encl: (1) NAVSHIPYD CHASN Photograph of New AFDB-7 Crane Lift in Holy Loch Scotland (3 copies)

1. The purpose of this letter is to commend your Mr. Donald T. Plettenberg for his dedicated support and exemplary performance in the handling of many details for delivery of the two 100 ton chain hoists on our Contract N00612-87-T531. NAVSHIPYD Charleston appreciates the quick action and delivery to support our schedule for loading the two new portal cranes and shipment to Holy Loch.

2. Enclosure (1), shows the new (310 ton lift) cranes being moved in Holy Loch by SMIT International floating crane, TAK LIFT-6 to US Navy Drydock, USS LOS ALAMOS (AFDB-7). Your 100 ton pneumatic powered chain hoists are used to level the new portal cranes so that the sixteen wheels will land on the rails simultaneously. The project was a great success as one new crane was loaded in the morning and the other one in the afternoon.

3. Please present one of these photographs to Mr. Plettenberg with our sincere appreciation for a job well done.

A. H. ANDERSSEN
Acting

J.D. NEUHAUS
CORPORATION ®

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Baltimore, Maryland 21207
Tel. 800-331-2889
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Navy Sealift Ship Construction

The Prime Near Term Opportunity For U.S. Shipyards

by James R. McCaul, President, IMA Associates, Inc.

Sealift ship construction continues to offer the largest near term prospects for U.S. shipyards, with $1.85 billion already appropriated and $1.2 billion requested in next year's defense budget to build or convert sealift ships.

Program Status

As has been widely reported, the Navy has been forced by the Department of Defense (DOD) to follow a highly formalized acquisition process for procuring additional sealift ships. Review and approval must be given by the Defense Acquisition Board (DAB) between major steps in the program.

The Defense Acquisition Board's meeting for Milestone I, approving the start of the engineering phase, is scheduled to take place during the first week in September. The meeting, originally scheduled for the end of September, was moved up as a result of sealift being accorded greater attention by top DOD officials.

Anticipating DAB approval, the Navy has announced intentions to issue a solicitation for class standard cargo handling equipment. The solicitation will call for the manufacture, acquisition, management and integration of major cargo handling class standard equipment for installation in new and converted sealift ships.

Sealift Program Management

It has been difficult to coordinate the varied interests and priorities of agencies involved in sealift ship planning.

Army top management sees a large, quickly acquired sealift capability to be an absolute necessity. The Army must be able to demonstrate an ability to mobilize and deliver combat equipment. Otherwise, there will be increasing pressure within DOD, OMB and Congress to impose much greater cuts on active Army forces.

The Navy, however, may not have always shared the same urgency. In fact, there may be some elements in the Navy who would like to use the sealift funds for other purposes.

To strengthen program management, a July 14 memo from the Deputy Secretary of Defense has designated the Acting Secretary of Navy as the DOD executive agent for sealift acquisition and accorded sealift a pilot program status (see exhibit 1). The Acting Secretary of the Navy has been a strong advocate of sealift and he is expected to shift the sealift ship program into high gear. Demonstrating his interest in improving sealift capability, the new secretary chaired a high level coordinating meeting on sealift just two days after assuming his new position.

Sealift Ship Fund

The Administration had requested that a special sealift ship fund be established to pay for sealift ship construction and conversion. This funding would be separate from other procurement accounts. The House Armed Services committee recently rejected the Administration's

proposal to set up this fund, maintaining that the funds should re - main in the Navy shipbuilding and conversion budget. House and Senate conference action on the authorization and appropriations bills this Fall will decide the outcome of the sealift fund.

Ship Conversion Contracts

A solicitation is to be issued for engineering design to convert commercial ships to sealift ships. Several contracts are to be awarded. The ships are to be Panamax size, have between 225,000 to 300,000 sq. ft. of deck space, draw no more than 35 feet fully loaded and be capable of a 24 knot speed. The Navy is looking to buy and convert four to eight ships, using the 15 percent of available sealift funds earmarked for conversion purposes. It is our understanding that 23 containerships have been identified as candidates. Four ships (Selandia, Toyama, Nihon and Jutlandia) owned by East Asiatic Company are said to be top candidates for purchase/conversion.

The Navy's decision to solicit proposals for conversion work marks a change in policy. Until now, higher priority had been accorded new construction.

The decision to place conversion before new construction reflects the need to get work into the shipyards quickly to shore up the deteriorating business base and to accelerate sealift ship acquisition.

GAO Sealift Study

The Mobility Requirements Study calls for ships capable of a 24 knot speed. In a recent analysis of Navy sealift plans the General Accounting Office recommended that the Navy consider buying and converting existing ships capable of speeds less than 24 knots. GAO argues that a slightly lower speed would have little impact on delivering cargo within the required time period. It is also GAO's position that limiting the pool of available ships to those capable of 24 knot speeds reduces the amount of competition. The Navy claims that 24 knots is the minimum acceptable speed and that there are a sufficient number of ships available worldwide to select four to eight for purchase/conversion.

GAO also finds that ship conversion should be a more cost effective option for acquiring sealift capability. According to GAO, "converted ships could be available up to one to one and a half years earlier, and cost savings could possibly reach $50 million per ship." In response, DOD agrees that conversions would save time, but not necessarily save money over the life cycle of the ship.

Sealift Advisory Service

IMA publishes a memo series reporting all major actions in the Navy sealift ship program. Policy developments, funding actions, solicitation announcements and contract awards are reported on a continued basis. The 1992 series is available for $650. To order contact: IMA Associates, Inc., 600 New Hampshire Ave., NW, Suite 140, Washington, D.C. 20037 USA. Telephone: (202) 333-8501; FAX: (202) 333-8504

Exhibit: 1
From: The Deputy Secretary of Defense

Memorandum for: Under Secretary of Defense for Acquisition
Acting Secretary of the Navy
Chairman of the Joint Chiefs of Staff
Under Secretary of Defense for Policy
Assistant Secretary of Defense for Program Analysis and Evaluation
Acting Comptroller of the Department of Defense

Subject: Strengthening the Sealift Capabilities of the Department of Defense

The national security strategy depends heavily upon the ability of the Department of Defense to transport promptly military personnel and material wherever they are needed to defend American interests abroad. Because of the vital importance of sealift in moving sizable forces abroad, and the department's identified need to increase its sealift capabilities, I direct as follows:

1. Priority: Strengthening the department's sealift capabilities shall be one of the highest priorities within the Department and shall be accorded such priority in the department's planning, programming and budgeting system and in the departments's acquisition system.

2. Sealift Requirements: Consistent with the Mobility Requirements Study (Vol. 1) (MRS) transmitted by the Secretary of Defense to Congress on January 24, 1992 and with the Deputy Secretary of Defense memorandum of February 14, 1992 entitled "Strengthening Department of Defense Transportation Functions," the Commander in Chief of the U.S. Transportation Command (CINCTRANS) shall: (a) determine priorities among sealift ship needs set forth in the MRS and submit those priorities to the Acting Secretary of the Navy within 30 days of the date of this memorandum and (b) provide any necessary supplemental requirements consistent with the MRS for sealift ship operational requirements matters not specified in the MRS.

3. Sealift Program: The Acting Secretary of the Navy is designated the DOD Executive Agent for acquisition of sealift and shall establish a Sealift Program, consistent with sealift priorities established by CINCTRANS under paragraph two, to construct or convert ships and equip ships to provide sealift for the Department of Defense. DOD Directive 5000.1 shall apply to the sealift program.

4. Pilot Program Status: The Under Secretary of Defense for Acquisition, in coordination with the Acting Secretary of the Navy and the Acting General Counsel of the Department of Defense, shall take such actions as may be appropriate to achieve the designation of the Sealift Program as a major defense acquisition pilot program pursuant to Section 809 of the National Defense Authorization Act for fiscal year 1991 (Public Law 101-510). The Under Secretary of Defense for Acquisition shall report to me within 30 days of the date of this memorandum on progress made toward designation of the Sealift Program as a major defense acquisition pilot program.

5. Assessment of Ready Reserve Force: CINCTRANS, in cooperation with the Department of Transportation, as appropriate, shall assess the readiness of the Ready Reserve Force to meet sealift needs of the Department of Defense and shall report thereon to me within 60 days of the date of this memorandum, together with such recommendations as he may deem appropriate.

The Chairman of the Joint Chiefs of Staff shall communicate this memorandum to the Commander in Chief of the U.S. Transportation Command.

D.J. Atwood

Navy Contracts

The Coast Guard is seeking a contractor to perform research and development to reduce fatigue in hulls. The solicitation is scheduled to be released September 23. For more information, contact **Dan McClusker** at (202) 267-2483.

Keystone Ship Berthing Inc., Jacksonville, Fla. $4.8 million fixed-price (plus reimbursable expenses) contract for layberth services on the hospital ship Comfort. Military Sealift Command.

Jonathan Corporation, Norfolk, Va. $9.4 million for the overhaul of the USS Concord, a combat ship scheduled to be turned over to the Military Sealift Command. Military Sealift Command (N00033-92-C-3012).

General Dynamics Corp., Electric Boat Division, Groton, Conn. $13.9 million cost-plus-fixed-fee contract modification to fund OMNIBUS engineering and technical services for OHIO class submarines. Naval Sea Systems Command (N00024-90-C-2115).

Paramax Systems Corporation, Systems Development, Great Neck, N.Y. $17 million cost-plus-award-fee contract modification for grooming of the combat systems for five follow-on ships for the Taiwanese Navy PFG-2 class patrol frigate program plus technical, logistics, program management and additional ship acquisition program management engineering and material support services. This contract is for Taiwan under the foreign military sales program. Naval Sea Systems Command (N00024-89-C-5230).

Philadelphia Naval Shipyard, Philadelphia, Pa. $8 million for Drydocking Phased Maintenance Availability (DPMA) of USS Butte (AE 27). Supervisor of Shipbuilding, Conversion and Repair, Bath, Maine (N62786-92-R-0002).

National Steel and Shipbuilding Company, San Diego, CA. Contract for the Phased Maintenance Program of USS Grindley (CG-21), USS England (CG-22), USS Sterett (CG-31) and USS Standley (CG-32). Contract amount for FY 92 is $195,907, but under options, if exercised, will extend the contract value to nearly $64 million through FY 96. Naval Sea Systems Command (N00024-92-C-8501).

Southwest Marine, Inc. Contract for the Phased Maintenance Program of USS Leahy (CG-16), USS Halsey (CG-23), USS Jouett (CG-29), USS Horne (CG-30) and USS Fox (CG-33). Actual contract for FY 92 is $99,438. Options under the contract, if exercised, will extend the value to more than $98 million through FY 96. Naval Sea Systems Command (N00024-92-C-8502).

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va. Nearly $47 million contract for the Phased Maintenance Program for AOR class ships homeported in Norfolk, Va. Naval Sea Systems Command (N00024-92-C-8503).

ITT Corporation, ITT Gilfillan Division, Van Nuys, Calif. $68.9 million contract for three AN/SPS-48E radar systems and nineteen Low Elevation Detection Improvement Field Change Kits. Naval Sea Systems Command (N00024-92-C-5625).

Phillyship, Philadelphia, Pa. $7.9 million contract for the Drydocking Phased Maintenance Availability (DPMA) of USS D.B. Beary (FFT 1085). Supervisor of Shipbuilding, Conversion and Repair, USN, Bath, Maine (N00024-92-H-8006).

Newport News Shipbuilding and Dry Dock Co., Newport News, Va. $17.3 million cost-plus-fixed-fee contract for the post shakedown availability (PSA) of USS Jefferson City (SSN-759). Supervisor of Shipbuilding, Conversion and Repair, USN, Newport News, Va. (N00024-92-H-8002).

Continental Maritime of San Diego, Inc., San Diego, Calif. $10.3 million cost-plus-award-fee/fixed-fee-contract for fitting out availability and emergent industrial work

for the LHD-2 ship. Naval Sea Systems Command (N00024-92-C-2200).

Maersk Line, Ltd., Madison, N.J. $41.5 million contract for a time charter (including option) for the charter of the dry cargo ship MV Maersk Constellation. The contract is for 17 months with two 17-month options. Navy Military Sealift Command Central Technical Activity (N00033-C-1225).

Van Ommeren Shipping (USA) Inc., Stamford, Conn. $38.6 million contract for the charter of Strong Virginian. The contract is for 17 months with two 17-month options. Strong Virginian, currently flying the flags of Antigua and Barbuda, will be reflagged U.S. and renamed upon delivery to Military Sealift Command. Military Sealift Command Central Technical Activity (N00033-92-C-1229).

General Electric Co., Defense Systems Department, Pittsfield, Mass. $15.3 million firm-fixed-price contract for 100 percent of the FY 92 requirement for the AEGIS director/director control, maintenance assist modules and site support. Contract includes options for FY 92 and 96. Naval Sea Systems Command (N00024-92-C-5100).

Sealift Tankships, Inc., Oyster Bay, N.Y. $40 million for time-charter contract for the MV Noble Star. The contract is for 17 months with two 17-month options. Noble Star will be used mainly in the Far East area for the point to point delivery of Department of Defense cargo. Military Sealift Command Central Technical Activity (N00033-92-C-1226).

Cormorant Shipbuilding Corp., Washington, D.C. $48.3 million time-charter contract for the charter of MV American Cormorant, a semi-submersible ship that will become part of Military Sealift Command's Afloat Prepositioning Force at Diego Garcia. U.S. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1208).

International Shipholding, New Orleans, La. $57.1 million time charter contract for the charter of Atlantic Forest. The contract is for 17 months with two 17-month options. Atlantic Forest is a LASH vessel currently flying the Liberian flag. The ship will be reflagged U.S. and renamed upon delivery, and will become part of Military Sealift Command's Afloat Prepositioning Force at Diego Garcia. U.S. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1206).

Central Gulf Lines, Inc., New Orleans, La. $31.4 million contract for the charter of the MV Green Wave. The contract is for 17 months with two 17-month options. The MV Green Wave will be used as the Diego Garcia/Guam shuttle for the point to point delivery of DOD cargo. U.S. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1227).

Central Gulf Lines, Inc., New Orleans, La. $31.4 million contract for the charter of the MV Green Ridge. The contract is for 17 months with two 17-month options. The MV Green Ridge will be used mainly in the Far East delivery of DOD cargo. U.S. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1228).

Red River Shipping Corp., Rockville, Md. $39.8 million contract for the charter of the MV Advantage. The contract is for 17 months with two 17 month options. The MV Advantage will be used mainly in the Far East delivery of DOD cargo. U.S. Navy's Military Sealift Command Central Technological Activity (N00033-92-C-1222).

Red River Shipping Corp., Rockville, Md. Nearly $47 million contract for the charter of the CGM Monet. The contract is for 17 months with two 17-month options. The CGM Monet will be used for prepositioning service in the Medi-

terranean. U.S. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1223).

Red River Shipping Corp., Rockville, Md. Nearly $47 million contract for the charter of CGM Utrillo. The contract is 17 months with two 17-month options. The CGM Utrillo will be used for prepositioning service in the Mediterranean. U.S. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1224).

Ingalls Shipbuilding, Inc., Pascagoula, Miss. $4.8 million firm-fixed-price contract for the selected restricted availability (SRA) of USS Gallery (FFG-26). Supervisor of Shipbuilding, Conversion and Repair, Pascagoula, Miss. (N00024-92-H-8585).

Portsmouth Naval Shipyard, Portsmouth, N.H. $9.6 million for the selected restricted availabilities (SRAs) of USS Whale (SSN-638) and USS Archerfish (SSN-678). Naval Sea Systems Command.

Ingalls Shipbuilding, Inc., Pascagoula, Miss. $20.7 million cost-plus-fixed-fee contract modification for follow yard services for DDG-51 class Aegis destroyers. Naval Sea Systems Command (N00024-88-C-2252).

General Dynamics Corp., Electric Boat Division, Groton, Conn. $63.8 million cost-plus-fixed-fee contract modification to exercise options for OMNIBUS engineering/technical and design agent services for OHIO class submarines. Naval Sea Systems Command (N00024-90-C-2115).

Edison Chouest Offshore, Inc., Gallian, La. $15.8 million firm-fixed-price contract for the use of the deep submergence vehicle support ship Laney Chouest. Laney Chouest will support deep ocean search and recovery operations. Navy's Military Sealift Command Central Technical Activity (N00033-92-C-1304).

Gibbs & Cox, Inc., New York, N.Y. $17.6 million option under a cost-plus-fixed-fee contract for flight upgrade development and engineering services in support of the DDG-51 class program. Naval Sea Systems Command (N00024-91-C-2801).

General Electric Co., Machinery Apparatus Operation, Schenectady, N.Y. $19 million cost-plus-fixed-fee contract modification for Naval nuclear propulsion components. Naval Sea Systems Command (N00024-92-C-4009, Mod P00001).

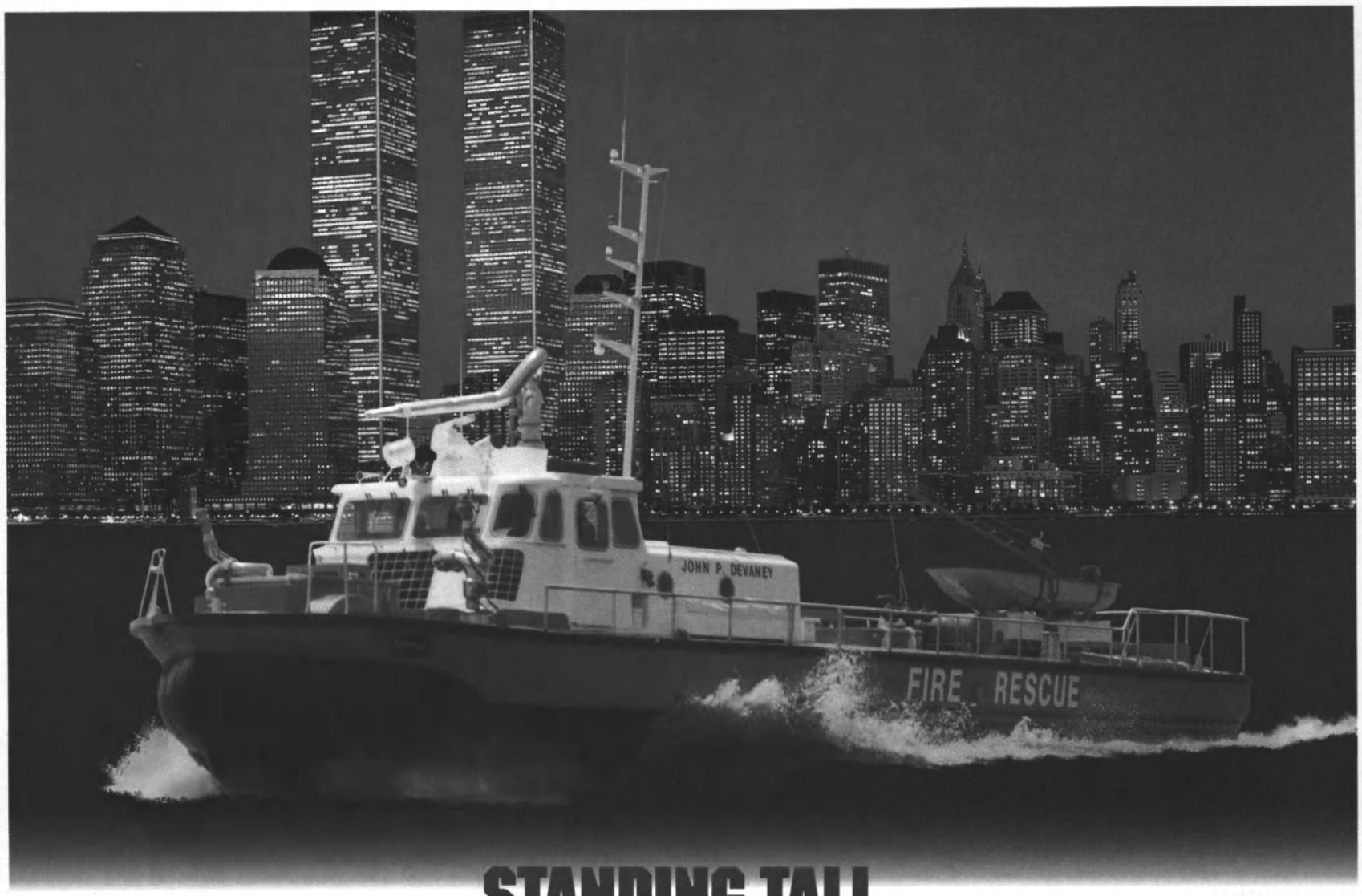
Westinghouse Electric Corp., Plant Apparatus Div., Wilkins Township, Pa. $15.8 million cost-plus-fixed-fee contract modification for Naval nuclear propulsion components. Naval Sea Systems Command (N00024-92-C-4005).

Raytheon Co., Equipment Division, Wayland, Mass. $58 million cost-plus-fixed-fee contract for the development of two upgrade kits for AN/SPS-49(V) radar. Naval Sea Systems Command (N00024-92-C-5627).

General Electric Company, Navy and Steam Turbine Dept., Fitchburg, Mass. $16.9 million firm-fixed-price contract for four high pressure propulsion turbines and the refurbishment of four low pressure rotors for the USS John F. Kennedy (CV-67). Naval Regional Contracting Center, Philadelphia, Pa. (N00140-92-C-AE18).

General Dynamics Corp., Electric Boat Division, Groton, Conn. A firm-fixed-contract not to exceed $6.75 million for the planning of the post shakedown availability of USS Maryland (SSBN-738). Supervisor of Shipbuilding, Conversion and Repair, USN, Groton, Conn. (N62789-89-G-0001).

Diagnostic/Retrieval Systems, Inc., Oakland, N.J. $57.3 million letter contract for material and services for AIDS (advanced integrated display stations). Naval Sea Systems Command (N00024-92-C-6308).



STANDING TALL IN THE BIG APPLE.

NEW SES MULTIPURPOSE FIRE & RESCUE CRAFT ESCORTS LEAD SHIP IN JULY 4TH TALL SAILING SHIPS PARADE.

While celebrating the past, New Yorkers got a view of the future when the first of two Textron Marine Systems' fire and rescue craft sailed up the Hudson River with the tall ships commemorating Columbus' voyage to America.

Built by Textron Marine Systems, the 70-foot craft, named for fire fighter, John P. Devaney, represents a new era in ship and pier fire fighting and harbor rescue. The new boats are the first additions to New York's fireboat fleet in 31 years.

A surface effect ship (SES) design, the craft rides on a cushion of air trapped between flexible bow and stern seals and rigid catamaran-style side hulls. This technology provides high-speed capabilities to respond nearly four times faster than conventional fireboats. Able to operate in extremely shallow water, the new SES craft reduces total fireboat inventory requirements. Other operating costs are kept low through fuel-efficient diesel engines and small crew sizes.

The craft is equipped with five monitors which deliver as much as 5,500 gallons per minute and are remotely operated from inside an enclosed wheelhouse by one crew member, using an automated fire-fighting system. Total crew requirements range from three in the wheelhouse to three to six on deck. Rescue equipment, navigational and communications aids and pumping systems on the new craft all represent the latest in fire-fighting technology.

Like New York, any harbor-based city benefits from swift response across water in emergency situations. Tall ships come and go, but New York City's SES fireboats will lead the way in keeping the harbor in safe hands well into the next century.

TEXTRON Marine Systems

Textron Marine Systems/Division of Textron Inc.

Textron Marine Systems, 6600 Plaza Drive, New Orleans, LA 70127-2584. Phone (504) 245-6600. FAX (504) 245-6634. Telex 6711199TMSNOLA

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Recently delivered by Ingalls, the U.S.S. Essex (LHD 2) will sail in mid-September for her Pacific Fleet homeport in San Diego.

Ingalls Delivers U.S.S. Essex

The U.S.S. Essex (LHD 2) was recently delivered to the U.S. Navy by Ingalls Shipbuilding division of Litton in Pascagoula, Miss. The ship is scheduled to sail in mid-September for her new Pacific Fleet homeport in San Diego, Calif.

Ingalls delivered the lead ship of the LHD program, U.S.S. Wasp (LHD 1) in May 1989. That ship is now on duty with the U.S. Atlantic Fleet. In September 1986, the U.S. Navy awarded Ingalls an additional contract in the LHD program, after competitive bidding, which included the LHD 2 construction contract, as well as now-exercised options for Kearsarge (LHD 3) and Boxer (LHD 4), now under construction. In December 1991 Ingalls was awarded a contract to build a fifth vessel, Bataan (LHD 5).

LHD 2's major equipment subcontractors include: Westinghouse, Sunnyvale, Calif., for reduction gears and turbines; Litton Guidance and Control Systems division, Woodland Hills, Calif., ship control consoles; Combustion Engineering, Inc., Windsor, Conn., boilers; General Electric Company, Fitchburg, Mass., generators; Jered Brown Brothers, Troy, Mich., elevators and steering gears; Litton Data Systems division, Pascagoula, Miss., electronic equipment; Crane Defense Systems, Conroe, Texas, helicopter handling system; Airtron, Morris Plains, N.J., waveguides; National Forge Company, Erie, Pa., propulsion shafting; and Stewart and Stevenson Services, Houston, Texas, diesel generators.

The centerpiece of the Navy's amphibious groups, the Wasp Class is the first to be specifically designed to carry the Landing Craft Air Cushion (LCAC) and the Harrier II (AV-8B) vertical take-off and landing jet.

The U.S.S. Essex is 844 feet long, with a beam of 106 feet. Two steam propulsion plants develop a combined 70,000 hp to drive the 40,500-ton ship at over 20 knots.

In addition to accommodations for 3,000 crew and embarked troops, the ship is provided with six medical operating rooms, four dental operating rooms and hospital facilities for 600 patients. LHD 2 also has more than 22,000 square feet of vehicle space and 100,000 cubic feet of cargo space.

Sophisticated sensors and electronics, a highly automated combat information center (CIC) and large staff accommodations allow LHD 2 to serve as the flagship for large scale amphibious operations.

Together with its 2.2-acre flight deck, 13,000-square foot well deck with monorail cargo handling system and 15,000-square foot hanger deck, LHD 2 has the means to deploy, command and support all elements of a 1,870-man Marine landing force in assault by air and amphibious craft.

To receive additional free information on the services offered by Ingalls Shipbuilding,

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U.S.S. Barry (DDG 52) underway during sea trials.

U.S.S. Barry On Sea Trials

The U.S.S. Barry (DDG 52), the first of eight ships being built by Ingalls Shipbuilding Division of Litton, Pascagoula, Miss., for the U.S. Navy's Aegis guided missile destroyer program, is presently undergoing at-sea testing before its delivery to the Navy later this year.

DDG 52 is the second ship in the Navy's Arleigh Burke (DDG 51) Class, designed to provide primary protection for the fleet through the next century. The U.S.S. Barry is 504 feet long, with a beam of 59 feet. Four General Electric/LM-2500 gas turbine engines power the 8,300-ton destroyer to speeds in excess of 30 knots.

The vessel is the fourth Navy destroyer named to commemorate the American Revolutionary War hero, Captain **John Barry** (1745-1803), holder of the Navy's first commission.

DDG-52's Aegis Combat System, the world's foremost naval weapon system, includes: the AN/SPY-1D phased array radar; the MK-41 Vertical Launching System (VLS), which fires a combination of up to 90 Standard surface-to-air, Tomahawk surface-to-land and surface-to-surface and VLA antisubmarine missiles; and an AN/SQQ 89 Antisubmarine Warfare System, with a bow-mounted AN/SQS 53C sonar and AN/SQR 19 towed sonar array.

The U.S.S. Barry will have eight Harpoon antiship missile launchers and MK-32 torpedo tubes, both mounted on the ship's deck. MK-15 Phalanx Close-In Weapons Systems and a five-inch deck gun will also be fitted. DDG 52 also features the LAMPS MK-III Control System, with helicopter landing and replenishment facilities.

U.S.S. BARRY
Equipment List

Main Engines, Reduction Gears, Ship Control Systems, Sonars, Aegis Combat System	GE
CP Propellers	Bird-Johnson
Shaft Bearings	American Metal
Steering Gear	Sperry
Generators	Allison
Pumps	Blackmer/Carver/Warren
Refrigeration & AC	York
Distilling Plants	MECO
L.P. Air Compressors	Ingersoll Rand
Ventilation Fans, Turbine & Generator Cooling Fans	Joy
Fan Coil Assemblies	Mario
Valves	Cia Val/Marotta/Eaton
Heaters & Coolers	Indeeco
Advanced Marine Cable	Raychem
Duplex Strainers	Chas.Bailey
Commissary Equipment	H.H.Green
Aegis Fire Control, SPS 49 Radar, AN/SPY-1D Transmitters	Raytheon

Aegis destroyers have been designed to match maximum survivability with potent offensive capability. In the Aegis destroyer program, the Navy returns to all-steel construction, with extensive topside armor placed around vital combat systems and machinery spaces. Acoustic, infrared and radar signatures have been reduced and a comprehensive Collective Protection System guards against nuclear, chemical or biological agents.

Ingalls Shipbuilding, lead shipbuilder for five of the latest classes of Navy surface combatants, has delivered 54 major warships to the fleet since 1975. In addition to the DDG 51 Class, Ingalls has delivered 15 Ticonderoga (CG 47) Class Aegis guided missile cruisers to the Navy, out of 19 the yard has been contracted to build.

Litton is a technology-based company providing advanced electronic, defense and resource exploration services and industrial automation systems to international markets.

To receive free literature with additional information about the services available from Ingalls Shipyard,

Circle 168 on Reader Service Card

Free Brochure Offered By Hagglunds Denison On New Business Unit

Hagglunds Denison recently announced that they are offering a new four-page, two-color brochure describing the capabilities of its marine-aerospace-defense group.

The brochure also explains the company's hydraulic systems and components for marine, aerospace, offshore and government applications. Many examples of typical applications are listed, as well as suggested places for use (i.e. tankers, drill ships, platforms)

Page four of the brochure lists the contact names for Hagglunds Denison, as well as addresses, phone and fax numbers.

For a free copy of the brochure offered by Hagglunds Denison,

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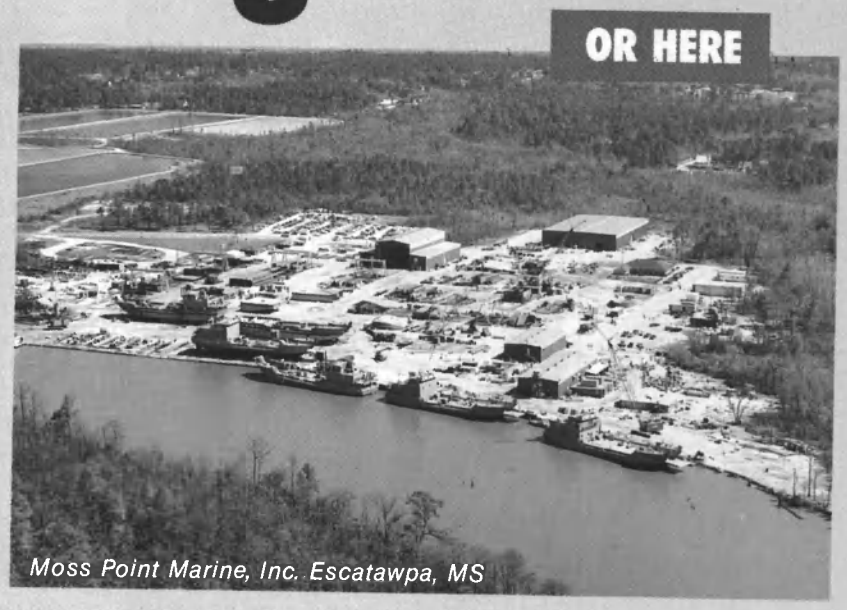
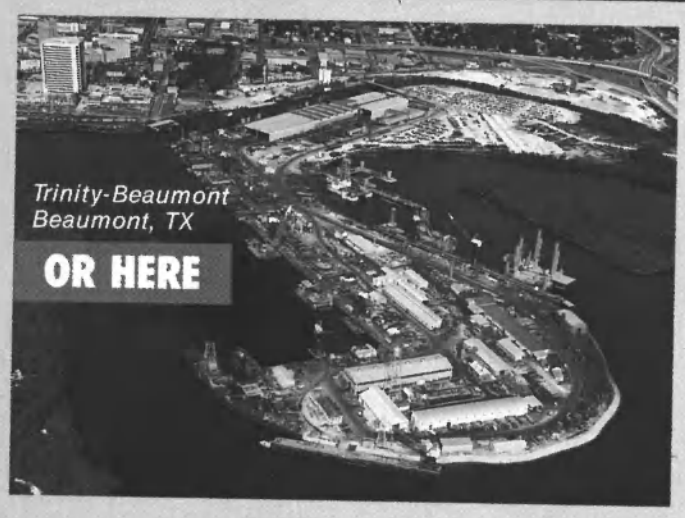
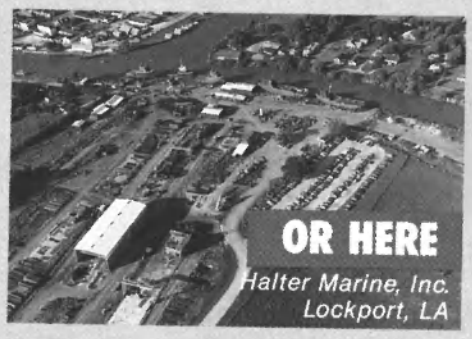
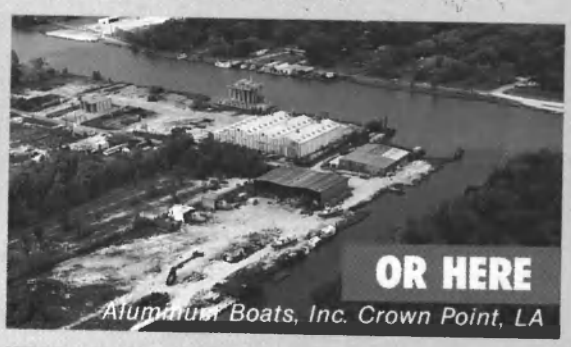
We can build your next boat or barge.









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P.O. Box 3029, Gulfport, MS 39505-3029/Tel. 601-864-0029/Fax 601-867-1666/Telex 6821246/Cable HALMAR

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NAVY CONTRACTS
(*Continued*)

G&M Welding & Fabricating Service, Galveston, Texas. $3.4 million contract for deactivation and topside repairs to the Ready Reserve Force (RRF) vessel SS Cape Lambert. U.S. Maritime Administration.

GNB Industries Battery Co., Lombard, lll. $6.2 million contract for five sets of Mod C and eight sets of Mod E submarine batteries for SSN 688-class submarines. Naval Sea Systems Command, Washington (N00019-92-C-0093).

Houston Ship Repair, Inc., Channelview, Texas. $3.7 million contract for deactivation and topside repair work on the Ready Reserve Force (RRF) breakbulk vessel, the SS Cape Lobos. U.S. Maritime Administration.

Buck Kreihs Company, Inc., New Orleans, La. $3.7 million contract for deactivation work and repairs on the Ready Reserve Force (RRF) breakbulk vessel SS Cape Farewell. U.S. Maritime Administration.

AT&T Federal Systems, Greensboro, N.C. $64.7 million increase in its structural acoustics program contract. The modification, negotiated with the Office of Naval Research, increases the total value of the contract to $103.4 million, for research and development through 1993.

Engineering Visions, Inc. (Envisions), San Diego, Calif. $6.8 million contract for its engineering services. Under the contract, all surface combat support ships scheduled for major maintenance periods on the east coast, west coast, Pearl Harbor, Guam or Japan will be served by Envisions.

Navy Begins 18-Month, $3.75 Million Drydocking Of Old Ironsides

The 63rd commanding officer of the U.S.S. Constitution, Cmdr. **Richard B. Amirault**, announced that the Navy has begun an 18-month long, $3.75 million "Drydocking and Inspection" (D&I) of the nearly 200-year old frigate.

The U.S.S. Constitution, also known as "Old Ironsides," is the oldest commissioned warship afloat in the world. She is berthed at Pier 1 in the Boston National Historical Park in the Charlestown Navy Yard, where the D&I to prepare the frigate for the bicentennial of her launching on October 21, 1997 will take place.

In addition to a thorough inspection to determine the vessel's condition, the bottom two-thirds of all three masts, all rigging, 30 percent of her hull copper and several wooden beams and knees on the gun deck will also be repaired. A more comprehensive maintenance and repair based on the inspection will begin after the Bicentennial.

The U.S.S. Constitution will come out of drydock in fall 1993 and all work will be completed by the end of 1993.

HDW Submits Bid To Build Type 212 Submarine

Howaldtswerke-Deutche Werft (HDW) recently submitted a bid to build the Type 212 submarine. The hull is to be made of non-magnetic steel.

The HDW Naval Sales Div. designed the Type 212 to prevent detection by active and passive sonar, as well as by acoustical means such as by infrared and magnetic anomaly devices. In order to prevent detection the hull would be covered with anechoic tiles and decks would be elastically mounted throughout the entire submarine.

The new submarine would have an air-independent propulsion system from a bank of proton-exchange-membrane fuel cells.

The proposed submarine would be 171.6 feet long, with a pressure hulldiameter of 21.9 feet. The Type 212 design calls for an X-shaped tail like Swedish and Dutch designs rather than the cruciform configuration typical of German submarines.

A Siemens Permasyn permanent magnetic motor would be used aboard the Type 212 and a diesel engine would be installed for surface operation and as an emergency back-up for the fuel cell system.

Navy Commissions Guided Missile Cruiser

The Department of the Navy recently commissioned the guided missile cruiser Shiloh (CG-67) at Bath Iron Works, Bath, Maine. Equipped with Tomahawk missiles, Shiloh is the 21st of 27 Ticonderoga class guided missile cruisers to be commissioned. The Shiloh will be operated by 375 officers and men.

The Shiloh's primary mission is to support carrier battle groups and amphibious forces, but it is also capable of operating independently or as the flagship of a surface action group. The ship is 567 feet long, has a draft of 31 feet, a beam of 55 feet and displaces approximately 9,500 tons.

Subcommittee Convenes To Review Definition Of Passenger Vessel

The House Subcommittee on Coast Guard and Navigation recently convened to review draft legislation from the Coast Guard which is requesting a consolidation of the definition of passenger, a clarification of the application of U.S. laws for passenger-carrying vessels and an elimination of a "loophole" concerning bareboat charter boats.

The draft proposes the following changes in the current law:

1. Create a single definition for "passenger" regardless of the vessel's classification;
2. Define an uninspected passenger vessel as one carrying up to 12 people, to comply with international regulations, while giving to the Secretary of Transportation the authority to require life rafts or other lifesaving equipment on uninspected passenger vessels as he determines appropriate;
3. Classify chartered vessels and demise charters carrying over 12 passengers as inspected passenger vessels to allow for greater Coast Guard oversight; and
4. Define "consideration" to determine who should be considered a "passenger".

Canadian CG Begins Inspections Of Older Foreign-Flag Bulk Carriers

Recent reports indicate that the Canadian Coast Guard has started to inspect older foreign-flag bulk vessels calling in Canadian ports. The Coast Guard recently seized six ships: two of which were in violation of their classifications and the other four for lifesaving and firefighting equipment violations.

The ships are apparently chosen according to Canada's own port state control statistics. Reports indicate that the Coast Guard will primarily choose vessels flying the flags of the Bahamas, Croatia, Cyprus, Liberia, Iran, Malta, Panama and the Philippines due to the fact that they have the highest percentage of deficiencies.

ASNE Co-Sponsors DDG-51 Class, Symposium In Bath, Maine

The Northern New England Section of the American Society of Naval Engineers (ASNE), the Supervisor of Shipbuilding (Conversion and Repair, Bath, Maine) and the Bath Iron Works Corporation will be co-sponsoring a technical Symposium at the Atrium Inn and Convention Center in Brunswick, Maine from Wednesday, September 23 through Friday, September 25, 1992. The Symposium, which will explore "The DDG 51 Class: A Surface Combatant for the 21st Century...From Design to Construction, The Evolutionary Process," will be attended by marine professionals from throughout the navy shipbuilding industry.

Andre Hargreaves, Steering Committee chairman for the symposium and councillor of the Northern New England Section of ASNE said, "While we have chosen the Arleigh Burke Class as the centerpiece of our symposium, this three-day event will not be confined to discussions of just one ship." Mr. **Hargreaves** also said that numerous professional papers relevant to a broad spectrum of issues will be presented.

The Honorable **James Courter**, chairman of the Department of Defense Base Closure and Realignment Committee, is scheduled to give the keynote address on the future of the defense industry in a changing world environment. Rep. **Courter** will speak at the symposium's formal banquet scheduled for Thursday, Sept. 24, at 7:30 p.m. The luncheon speaker will be from the Office of the Secretary of the Navy, addressing the evolving role of Surface Combatants in the new world order. In all, 15 sessions are to be offered to attendees of the symposium.

The jointly sponsored ASNE symposium will begin at 1 p.m. on Wednesday, Sept. 23 with opening remarks by **Jerome J. Fee**, president of the American Society of Engineers through 1993. Mr. **Fee** graduated from the U.S. Naval Academy and served on board the USS Abbott (DD-629) before attending MIT where he received his M.S. degree in mechanical engineering and the degree of naval engineer. Following Mr. **Fee**'s opening of the symposium, the Wednesday session will feature a panel discussion on "Ship Design and the Construction Process: Problems and Solutions."

At 3:45 p.m. on Wednesday, Rear Admiral (Sel) **Paul M. Robinson**, USN, Director, Ship Maintenance & Modernization Division, will moderate the presentation of two papers dealing with the topics: "DDG Class Designed to Survive: A Live Fire Test Strategy;" and "AEGIS Heritage."

The symposium's Thursday, Sept. 24 program will feature four sessions, at 8:15 a.m., 10 a.m., 1:15 p.m. and 3 p.m. respectively. During each of these times, according to Mr. **Hargreaves**, there will be three concurrent sessions, to give attendees the option to choose the topics of top importance to them.

The ASNE symposium's final day includes an 8:15 a.m. session moderated by Rear Admiral **George A. Huchting**, USN, AEGIS Program Manager. Admiral **Huchting** will also provide closing remarks at 11 a.m. when he will assess "Naval Shipbuilding: Requirements for the Future."

Following the symposium, Bath Iron Works will launch the DDG 56 on Saturday, September 26.

For more information regarding registration to attend this three-day symposium, contact the American Society of Naval Engineers at: 1452 Duke St., Alexandria, Va. 22314-3458. Phone and FAX numbers are (703) 836-6727 and (703) 836-7491, respectively.

Coast Guard Revising Regulations In 46 CFR5

According to reports the Coast Guard is revising the regulations in 46 CFR5 to increase the number of reasons that a license, certificate of registry or merchant mariner's document may be able to be suspended or revoked. This revision is being made in conjunction with OPA90.

The Coast Guard is revising the regulations to make convictions of driving violations chargeable under Suspension and revocation proceedings. The following offenses will be included in the revision:

1. Operating a motor vehicle while under the influence of, or impaired by alcohol or drugs;
2. A traffic violation connected with a fatality;
3. Reckless driving;
4. Racing on the highways; and
5. Any offense that would prevent issuance of merchant mariner's credentials.

New Vacuum Sanitation Valve Cuts Maintenance And Repair Costs

Jets Vacuum AS of Norway has introduced a new electronically-controlled valve for flushing control units on vacuum toilet systems.

The company reports that the valve mechanism in traditional vacuum toilets is expensive to service and maintain due to the great number of parts in the flushing control unit.

The Jets Electronic Controlled Toilet Valve, the EFD valve, eliminates many problems. The EFD valve has a control device consisting of fewer components than a traditional unit, of which only two moving parts are involved. The end result, therefore, is a reliable and simple system, requiring no preventative maintenance and a minimum of back up spare parts. This allows for fast and easy trouble shooting and repair.

More than 10,000 of Jets EFD valves have been supplied over the past four years. Users include owners of traditional vacuum toilets who are able to fit an EFD valve from Jets as a direct replacement for existing pneumatic control valves.

Jets EFD valve is interchangeable with valve of other systems. Spare parts and service facilities will be available for owners of any kind of marine vacuum systems by the end of 1992 on a worldwide basis.

For more information,

Circle 180 on Reader Service Card

IMSSCO Offers 16-Page Brochure On Rockwood Fire Protection Systems

International Marine Supply & Service Company (IMSSCO) is the master marine distributor for Rockwood Systems Corporation. Rockwood Systems is a full service company that designs, engineers and manufactures a full line of fire protection equipment. IMSSCO is now offering a 16-page brochure describing Rockwood Systems' full line of fire protection products now marketed by IMSSCO and are U.S. Coast Guard, U.S. Navy and U.L. approved.

The brochure contains complete details about such systems as foam proportioning, dry chemical and halon extinguishing/suppression. Also included are detailed descriptions of the products that the company offers. The products described in the brochure are marine monitors and turrets; nozzles and accessories; foam concentrate; high expansion foam; valves; and fire system detection and control panels.

Rockwood Systems provides a complete systems approach to design, fabricate and repair new or existing process control, fire or gas detection and extinguishing systems. Rockwood provides services in consulting, design, engineering, fabrication, start up, maintenance and installation of total systems.

For a copy of the brochure from Rockwood Systems,

Circle 132 on Reader Service Card

For further information describing the services and products provided by IMSSCO,

Circle 82 on Reader Service Card

Hyde Marine Systems Appointed Representative For KoopNautic

Hyde Marine Systems was recently appointed exclusive importer and licensed manufacturer for KoopNautic products in the U.S.

KoopNautic is an engineering company which specializes in roll damping for vessels 40 to 250 feet long. They have been designing and manufacturing stabilization systems for more than 25 years.

From the manufacturers' original SeaRocq fin stabilizers to the innovative rotary retractable cylinders, Multi4 Trim Tab stabilization system and the new GRP/Kevlar advanced fin blade, KoopNautic designs reportedly, according to the manufacturer, meet the most demanding requirements for safety and comfort during adverse weather conditions.

For further information about Hyde Marine Systems and its entire line of products and services,

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Circle 204 on Reader Service Card

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US prices slashed by up to 23%.
It's just got to be Goonhilly!

Telephone calls from-ship using BT's Inmarsat-A service have been significantly cut in price.

At the same time, BT's satellite coverage via Goonhilly has just been doubled.

Costs of calls to the US and Canada have been cut by as much as 23% off-peak and 18% at the standard rate.

Calls to the UK, Singapore and the Nordic countries are reduced by up to 12% off-peak and 7% standard rate.

Charges to other countries have also fallen.

Meanwhile, in response to customer demand, you can now route Inmarsat calls through Goonhilly - access code 02 - using both East and West Atlantic Ocean Region satellites.

Which means that Goonhilly coverage now includes the whole of the Atlantic, all of the Mediterranean, North Sea, the Gulf and parts of the Pacific and Indian Oceans.

The advantages of BT's Goonhilly service are well-known, with quality communication links to and from ship. BT also provides expert technical back-up, superb customer service support and a wide range of bureau facilities.

BT's Inmarsat-A is the world's foremost satellite communications service. Now, it's just got bigger - and it costs you less.

For more information and a free wallchart showing the new coverage area, please call our Customer Services Department on: 071 492 4996 (International +44 71 492 4996). Fax: 071 606 4640 (International +44 71 606 4640) or complete and return the coupon.

BT

Please send me more details
about BT Inmarsat-A prices and coverage.

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Company _____

Position _____

Address _____

_____

Telephone _____

Return to: BT Inmarsat-A Customer Services, MR
43 Bartholomew Close, London EC1A 7HP (UK)

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Scientific-Atlanta Creates New Business Unit For Mobile Satellite Communications

Scientific-Atlanta, Inc. has created a new business unit dedicated exclusively to the mobile satellite communications market. The newly formed mobile satellite communications business unit will design, manufacture and support a wide range of mobile satellite communications equipment that will be used on land, at sea and in the air.

"Mobile satellite communications is the fastest growing segment of the satellite communications industry," said **William E. Johnson**, chairman and CEO, Scientific Atlanta. "The new digital capability of satellites and smaller digital terminals are creating an entirely new set of customers, ranging from briefcase-carrying executives to small boat owners. To serve this market, we are staffing the new business operation with proven satellite communications professionals, and we are investing a significant amount of financial resources to help accelerate their success."

Faris Gaffney

Inmarsat, the international maritime organization and the leading provider of global mobile satellite communications services, expects the number of Inmarsat-compatible earth stations in use to rise from the current number of approximately 50,000 to more than 400,000 by the turn of the century. These figures combine three kinds of terminals—maritime, land mobile and transportable, or briefcase models.

A key driver of this growth is Inmarsat's new Standard-M service, which provides voice, data and fax capability at about one-half the usage fee associated with alternative services. In addition to the lower usage fee, the equipment used to access Standard-M service is smaller and less costly than terminals associated with previous services.

While Standard-M-based mobile satellite communications is not for everyone, it has two basic advantages over competing cellular technology. First, cellular's maximum distance limit of about eight miles does not come into play in mobile satellite communications, where there are no distance limits. Communicators using mobile satellite communications can reach each other via public networks, even from the most remote locations. Second, global standards govern satellite-based mobile communications, while no such standards exist for cellular technology. The same mobile satellite communications terminals and equipment can be used anywhere in the world, significantly increasing transportability.

Macy Summers

"We realistically expect our mobile satellite communications business to be as big as our stationary satellite earth station business within five years. That's why we're placing some of our top business and engineering talent in this new group," said **Jack Acker**, president Network Systems Group (NSG), Scientific-Atlanta. **Faris Gaffney**, NSG's former vice president of marketing, will head up the new mobile business group as vice president and general manager, reporting directly to Mr. **Acker**. **Macy Summers,** NSG's former director of business development, will oversee sales and marketing.

Under Mr. **Gaffney**'s direction, the group will be introducing a variety of mobile satellite communications products, ranging from small, low-speed, data-only terminals to large coastal earth stations. In a related announcement, appearing elsewhere in this issue of the MARITIME REPORTER, Scientific-Atlanta details the introduction of a new Inmarsat M terminal.

The new mobile satellite communications business unit will occupy its own facility in suburban Atlanta.

For complete literature describing all of the services and equipment offered by Scientific-Atlanta,

Circle 131 on Reader Service Card

GE Navy & Small Steam Turbine Signs Agreement With Renk Tacke

GE Navy & Small Steam Turbine, of Fitchburg, Mass., recently announced that it has signed a technology transfer agreement with Renk Tacke of Germany. With the signing of the agreement Renk Tacke is licensing GE with respect to high power medium diesel reduction gears and clutches. The agreement will allow the two companies to work together on opportunities involving diesel engine reduction gears and clutches for ship propulsion systems.

Renk Tacke is one of the world's leaders in gear technology and has extensive experience with the design and manufacturing of single and multi-engine marine reduction gears driven by medium speed diesels. Reduction gears with ratings of 46,000 shp are in service, providing reliable and proven performance. GE, one of the leading manufacturers of main reduction gears for the U.S. Navy, will use the experience offered by Renk to bring technology to the Strategic Sealift Program.

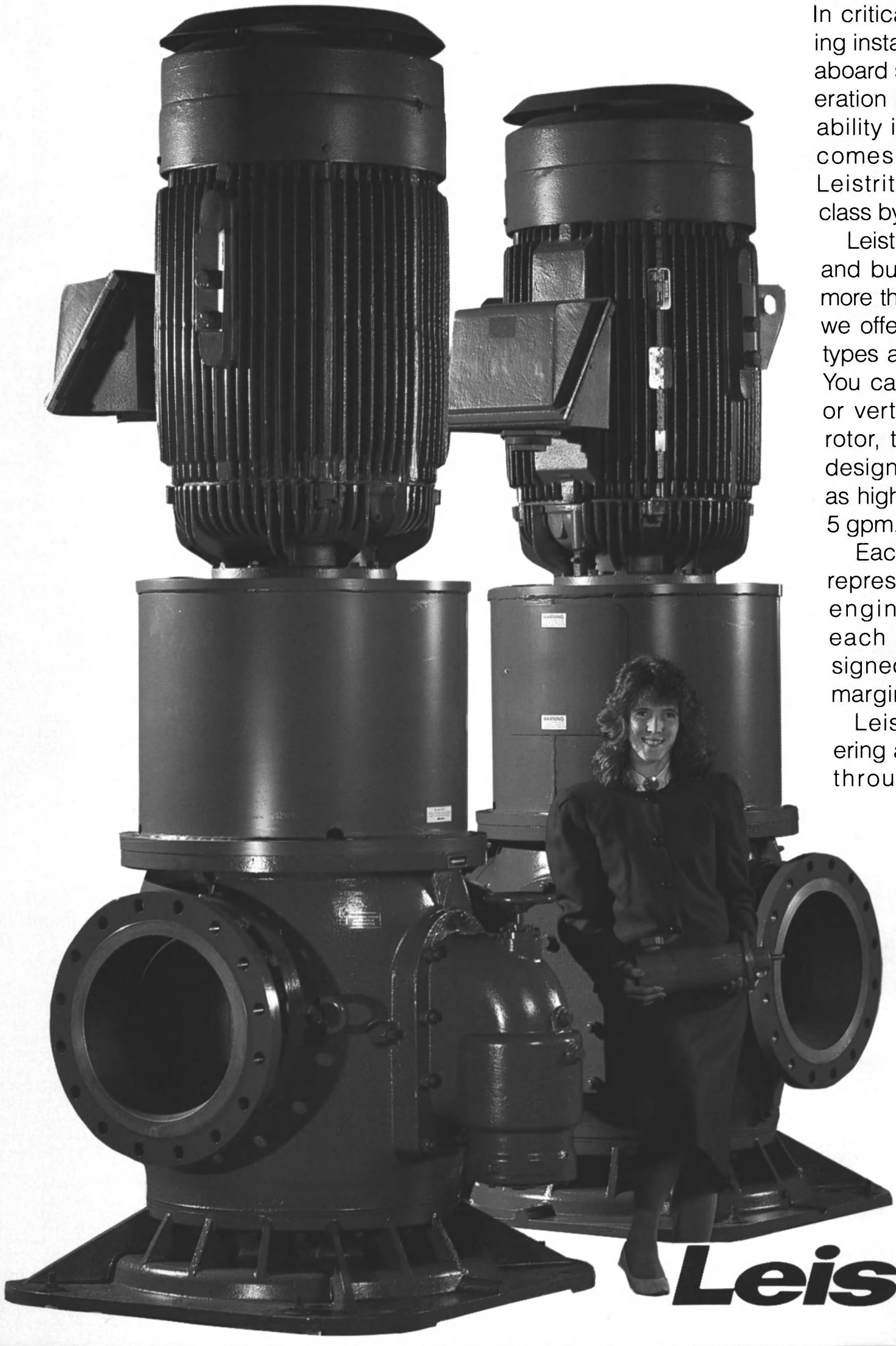
GE manufactures main reduction gears for ship propulsion systems, steam turbines for marine and industrial applications, and generator sets for ship board power.

For further information about the products manufactured by GE Navy & Small Steam Turbine,

Circle 8 on Reader Service Card

From the largest to the smallest...

Leistritz screw pumps for lube & fuel service.



In critical lube and fuel pumping installations—such as those aboard ships and in power generation plants—pump dependability is crucial. And when it comes to dependability, the Leistritz screw pump is in a class by itself.

Leistritz has been designing and building screw pumps for more than 65 years. And today, we offer the broadest range of types and sizes on the market. You can select from horizontal or vertical models; from two-rotor, three-rotor or five-rotor designs; and from capacities as high as 4500 gpm, down to 5 gpm.

Each Leistritz screw pump represents a no-compromise, engineered solution. And each is conservatively designed to give you an extra margin of reliability.

Leistritz operates engineering and service facilities throughout the world, and will work closely with you in providing expert application and installation assistance.

For further information on the *largest of all* screw pump programs, contact Leistritz today.

Leistritz Corporation
165 Chestnut Street
Allendale, NJ 07401
☐ 201-934-8262
FAX 201-934-8266

Circle 330 on Reader Service Card

Leistritz

The ECO-800 built by Ecomarine USA

Aluminum Boats Inc. Delivers New ECO-800 Multi-Mission Vessel To Ecomarine USA

Ecomarine USA recently unveiled its new ECO-800 multi-mission vessel which is an "Americanized" version of an existing European design. The ECO 800 was built by Aluminum Boat Inc., a subsidiary of the Trinity Marine Group. Ecomarine designed the vessel to serve users in oil and chemical companies, municipal organizations, and scientific or ecological interests. Therefore the vessel is fitted with hardware and systems which reflect the needs and services desirable to all three categories.

For oil and chemical companies the vessel is fitted with oil recovery and fire fighting capabilities while trash and debris recovery units are provided for municipal organizations. The scientific community will be able to use the vessel's marine sampling and hydrographic charting capabilities derived from the optional ECO-Boss system and onboard GPS instrumentation.

The vessel has a low speed propulsion system which consists of twin 3406 Caterpillar diesel engines which drive twin four-blade, fixed pitch, variable speed propellers. The ECO-800 is also fitted with bow thrusters which, when used with the propulsion system, reportedly allow it to remain motionless and maintain a controlled flow of water over the sill formed by the open bow doors. The port and starboard bow doors open to allow an underwater shelf to be exposed while using the ballast system to keep a precise water level over the shelf.

Once the water has been filtered and cleaned, the water exits the propeller tunnel and passes between twin spade-type rudders which direct the water, as well as giving the vessel added maneuverability.

The ECO-800 has a length of 65 feet, a breadth of 17 feet and a draft of six feet. The vessel has a cruising speed of 12 knots when fully loaded.

The oil recovery system consists of two Vikoma oil recovery units with aluminum rotating blades. The vessel can recover about 76 metric tons of oil per hour and has storage capacity for 88 barrels. Off vessel storage can be made possible through the use of a floating dracone.

For further information about the ECO-800 built by the Trinity Marine Group,

Circle 83 on Reader Service Card

ECO 800
Equipment List

Main Engines	CAT 3406
Propellers	Michigan Nibral
Thrusters	American Bow Thruster
Hydraulics	Rexroth/ Womack
Suction Screw	Hydromarine
Generators	Onan
Heating/AC	Lemoine Marine
Engine Controls	Morse
Steering Controls	Al George
Deck Machinery	Vikoma, Kepner
Shafting	Aquamet
VHF Radio	Standard Horizon
Echo Sounder	Furuno
Radar	Furuno
Compass	Danforth Express
Loran	Ray Jefferson/Furuno

Increase In Classing Activity For ABS During First Half Of 1992

The American Bureau of Shipping (ABS) recently reported that it had an increase in its classification activities involving both new and existing vessels during the first half of 1992. ABS reports that it classed 329 new vessels and 151 existing vessels. Existing vessels are those which have been previously unclassed, changed from the class of another society, or had been dropped from ABS class and were reinstated.

During the first half of 1991 only 310 new vessels and 98 existing vessels were classed, while in 1990 the figures were considerably lower.

However, when considering the number of vessels on order which were being built according to ABS class only 720 vessels had either been contracted or were under construction during this period as compared to the same period during 1991 when orders stood at 884 vessels.

Jet-Lube Offers Free Color Brochure On Lube Products

Jet-Lube of Houston, Texas, maker of specialty lubricants and compounds for the marine industry, is offering a free brochure detailing its product lines. Among the company's marine product lines are Marine-Kopr™, a copper anti-seize compound for use in engine rooms; Marine Moly™, a molybdenum disulfide paste for use on open spur gears and marine transmission gears; Marine Multi-Purpose E.P. Grease, with EP additives, a versatile soap grease for excellent salt water, rust and corrosion protection; and Marine Wire Rope and Chain Lubricant for corrosion-protection of wire rope and chain.

The literature provides application information, service ratings, and packaging availability information on each product, as well as several color photographs.

For a copy of the brochure,

Circle 45 on Reader Service Card

Ranger Oil Acquires Oil And Gas Interests Of MLC

Ranger Oil of Canada recently announced that it has acquired oil and gas interests from MLC, a subsidiary of Mutual Life Assurance.

According to the president of Ranger Oil the increase in production from this acquisition could add as much as $12 million to the company's annual revenue from Canadian operations. Reports indicate that more than 70 percent of the added production is concentrated in 10 different properties.

According to reports, Ranger experienced an 86 percent drop in earnings in 1991 from $42.4 million to $5.8 million which the company attributed to a drop in production revenues and special circumstances resulting from passing on of company chairman **Jack Pierce** last year.

Ranger paid about C$68.3 million (US$57.4 million) for the entire acquisition. The company claims that finances for this acquisition will come from current working capital and existing lines of credit.

The purchase reportedly increases oil reserves by about 54 percent and also helped the company achieve an objective by encouraging exploration and production activity in Canada.

Equipment Division Of Alexander Industries Sold To Alexander-Sevin

Alexander Industries, Inc., recently announced that it has sold its Equipment Sales Division to **Arthur J. Sevin, Jr.**, who has been the president of the company for several years. Mr. **Sevin** recently began operations under the name of Alexander-Sevin, Inc. which is located in New Orleans, La. The new company will operate from the same location with the same personnel.

Alexander-Sevin, Inc. provides equipment to the marine and offshore industry worldwide. It serves as manufacturers representatives and stocking distributors.

For literature describing the complete line of products and the capabilities of Alexander-Sevin,

Circle 10 on Reader Service Card

Astro Pak Corp. Announces Two Key Appointments

The Astro Pak Corporation recently announced two key appointments within the company.

Tony Collins was appointed assistant vice president in charge of operations and will coordinate nationwide Marine services and fabrication. He will be moving to the company's corporate headquarters in Downey, Calif.

Gary Jolley was appointed San Diego division manager and will be responsible for the marine pressure system cleaning, testing and fabrication operations, according to **Carl W. Verheyen, Jr.**, president of Astro Pak.

Astro Pak is one of the leading companies dealing in precision cleaning, testing and fabrication. There are marine divisions located in Chesapeake, Va., San Diego and Honolulu.

HMC Uses GE Equipment To Monitor Ship To Shore Energy Usage

Hialeah Meter Co. (HMC) of Hialeah, Fla. uses GE equipment to monitor and record ship to shore power requirements and usage, which helps to conserve energy.

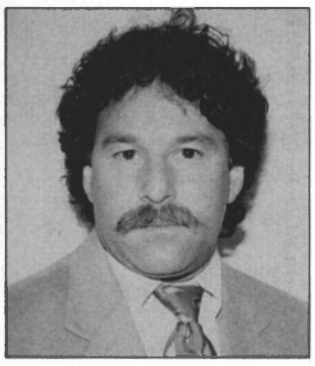
With HMC equipment, land-based operations can be alerted to predetermined demand thresholds. The equipment can be utilized either remotely via telecommunications or, in some cases, via power lines.

For free information on HMC capabilities,

Circle 58 On Reader Service Card

Moss Named Corporate V.P. By Phillyship

Joel H. van Diepen, chairman of the board, and the board of directors of Philadelphia Ship Maintenance Co., Inc. (Phillyship) have recently elected **Michael W. Moss** as corporate vice president.



Michael W. Moss

With Phillyship since 1982, Mr. **Moss** will continue as vice president and general manager of Phillyship of Baltimore, as well as the corporate adviser for the commercial marine division.

Mr. **Moss** is a past president of the Baltimore Propeller Club, and currently serves on the Baltimore Private Sector Port Committee.

Brown Brothers Wins Stabilizer, Steering Gear Orders Worth $17 Million

Brown Brothers, the Edinburgh, Scotland-based specialists in marine motion control equipment, won orders for ship stabilizers and steering gears worth about $17 million.

Brown Brothers, part of the Marine Engineering Division of Vickers PLC, has been jointly selected by Meyer Werft shipyard of Papenburg and P&O Cruises Ltd. to supply the ship stabilizer system for the 67,000-ton cruise liner under construction at the German yard. With an area of 231.3 square feet per fin, the VM600 stabilizers will reportedly be the largest ever fitted to a ship.

Previously, the 156-square-foot Brown Brothers fins fitted to four of Carnival Cruise Line's Fantasy Class of cruise liners were the largest in the world. The state-of-the-art technology employed means that, where previously four fins would have been necessary to achieve required performance, now only one pair of VM Series fins is needed.

Kvaerner Masa-Yards of Helsinki have also ordered 166.7-square-foot VM500 stabilizers for two additional Fantasy Class vessels to be built for CCL.

Brown Brothers will also manufacture the stabilizer and steering systems for two light frigates for the Malaysian Navy under construction at Yarrows Shipbuilders in Glasgow. Brown Brothers will also supply Yarrows Shipbuilders with ancillary equipment for the latest batch of Royal Navy Type 23 frigates which were recently awarded to the Scotstoun yard.

For free literature on the steering and stabilizer systems from Brown Brothers,

Circle 15 on Reader Service Card

New Geared Socket Tool From Swearless Tools; Literature Available

Swearless Tools Corporation, Boulder, Colo., has recently introduced a geared socket tool developed for turning line fitting nuts to its product line.

The tool consists of a drive head and a set of geared sockets that open to fit around a continuous line, and then locks in a shut position to begine operation.

The tool is available in socket sizes ranging from 3/8 inch to 13 inches. The heads attach to any of a large number of commercial torque adjustable electric and hydraulic drive tools providing a fast, efficient means of removing hydraulic lines or pipe fittings, installing fittings, and precision adjusting the torque. The tools come with a flexible drive shaft, allowing access to lines that may be blocked or obstructed.

For free literature on the new geared socket tool from Swearless Tools,

Circle 35 on Reader Service Card

Tracor Marcon Acquired By Electronic Marine Systems

Tracor Marcon Monitoring Division of Rockville, Md., has been acquired by Electronic Marine Systems, Inc. (EMS) of Rahway, N.J. EMS Marcon is continuing to manufacture and provide full support for the product from its three locations in Washington, Louisiana and New Jersey.

EMS Marcon has just developed and commissioned a PMS6000 shipboard monitoring and control system for China Shipbuilding in Taiwan for a Taiwanese patrol boat.

For more information about the PMS6000 shipboard monitoring and control system,

Circle 177 on Reader Service Card

Chris-Marine Offers Tool To Remove Cylinder Liner Wear Edges

Chris-Marine of Sweden introduces the new VKS machine, a portable unit which is designed to effectively and cost-efficiently remove the wear edge in cylinder liners.

The VKS portable milling machine purportedly saves money by saving time and effort. The machine mills away the wear edge accurately using a pneumatic milling. It comes in all sizes to fit every cylinder diameter from 300 mm to 1,000 mm.

The VKS machine, easily installed on top of a liner, is turned manually.

For more information on Chris-Marine's new VKS machine,

Circle 171 on Reader Service Card

Study Says Seattle Is Able To Convert Breakbulk Terminal

According to the results of a recent study, the Port of Seattle would still have enough space to accommodate its breakbulk cargoes if it converted one of its breakbulk terminals into a container terminal.

Reports indicate that the port estimated that its container revenues stood at about $23.5 million. Most of the breakbulk cargoes shipped through Seattle consist of pulp, aluminum, steel and chilled fruit. Shipments of chilled fruit brought in about $1.8 million while the other three only brought in about $1.4 million.

According to **Keith Christian**, director of marine planning for the Port of Seattle, several million dollars were recently spent on the port's breakbulk facilities, including the expansion of refrigerated warehouses for fruit shipments.

The port is supposedly shifting its focus from breakbulk only in order to accommodate both breakbulk and container shipments.

Stockham-Ficotech Offers Emergency Shutoff Device

Stockham-Ficotech is now offering its emergency shutoff device which operates a valve during an emergency by using an independent mechanical principle.

Emergency shutoff device

The safety device reportedly requires no outside element, such as air or power. The patented low maintenance design provides the reliability required for safety applications. Valves are made to be fully functional with the unit in place according to the company. Various models are available in sizes ranging from half an inch to 36 inches for multi-turn and quarter turn valves. The device can also be furnished with a valve or retrofit to fit an existing valve.

For more information describing the emergency shutoff device,

Circle 66 on Reader Service Card

Coast Guard Adopts OPA 90 Provisions

The Coast Guard has formally incorporated OPA 90 penalty provisions for operating a vessel while intoxicated and for violating the International Convention for the Prevention of Pollution from Ships (MARPOL) in the Code of Federal Regulations.

Prior to OPA, an individual operating a vessel while intoxicated was subject to either a civil penalty of up to $1,000 or a criminal penalty of up to $5,000, imprisonment for up to one year, or both. OPA 90 did not alter the civil penalty for this offense, but did modify the criminal penalty provisions. Operating a vessel while intoxicated is now considered a class A misdemeanor and is punishable by imprisonment of up to one year and a fine of not more than $100,000. OPA 90 also modified the penalty for knowingly violating the provisions of MARPOL. Violation of MARPOL is now considered a class D felony and is punishable by imprisonment of not more than six years and a fine of up to $250,000.

Maxon Marine Completes Drydock For Carline Tank Services

Maxon Marine of Tell City, Ind., recently finished construction of a 1,100-ton drydock for Carline Tank Services. Carline's facility is located on the Lower Mississippi at mile 182.

The dock cost about $550,000 to build and has a four-foot blocking system. It is 60 feet between the wingwalls and reported to be capable of lifting 150-foot by 52.5-foot barges or in the open-ended mode, 300-foot vessels.

The company states that it will use the drydock to repair chemical and dry cargo tank barges that are used on the Mississippi River. Gas-freeing services are also performed by Carline Tank Services.

For more information detailing the services and facilities provided by Maxon Marine,

Circle 165 on Reader Service Card

Viking Offers New Lifesaving Boat

A new fiberglass lifesaving boat has been introduced by Viking Life Saving Equipment. Designed specifically for the shipping and offshore industries, the new "man overboard" boat, dubbed the Norvik 470 GRP I, is 16 feet long and can accommodate 27 to 36 hp diesel outboard motors. Gas engines can vary from 25 to 60 hp. The boat is colored bright orange and is constructed from fire-retardant polyester fiberglass. Because of its built-in polyurethane buoyancy, the boat is unsinkable.

The Norvik 470 GRP I rescue boat from Viking

The boat is delivered complete with full equipment for rescue according to the 1983 Amendments to the SOLAS 1974 Convention. It is completely approved by the Danish Maritime Authority, and U.S. Coast Guard approval is pending.

For more information on Viking Life Saving Equipment,

Circle 175 on Reader Service Card

McNab Offers Conductivity Sensor For 'Hot Tap' Valve

For more than fifty years, McNab Incorporated, a well-known leader in the manufacture of fluid monitoring equipment, is offering the Model MC-107, a hermetically sealed, four-range conductivity sensor with automatic temperature compensation designed for installation with the McNab "Hot Tap" L-3 valve. McNab claims that the combination provides the user with a sensor that does not require any system shutdown to operate, or remove under pressure. Start up problems are eliminated and inspection and calibration can be easily accomplished.

The MC-107 with the L-3 valve eliminates the need for bypass piping and its time delays, therefore producing a faster, higher quality signal.

The "Hot Tap" valve is sized for 1-1/4-inch NPT and can be supplied in plastic, brass of stainless steel. Temperatures can go as high as 275 degrees Fahrenheit. Palladium electrodes are used for a longer service life than conventional stainless steel or other non-noble metal electrodes.

This high quality sensor can be used in water treatment, public utility, electronic and chemical applications.

For literature describing the conductivity sensor from McNab,

Circle 70 on Reader Service Card

AVAILABLE AT ZIDELL
FOR SALE OR CHARTER

OCEAN DECK BARGES

Length	299'0"	302'0"
Beam	90'0"	76 0"
Depth	20'0"	20'0"
Deadrise	–	2'0"
Draft Light	2'7-1/2"	3'10"
Draft Loaded	15'10"	16'
Transverse Bulkheads	7	8
Length Bulkheads	3	1
No. Tanks	32	18
Rolled Bilge	–	24"
Curved Rake Bow	29'	49'
Long Flat Raked Stern	30'	50' Long Curved Rake
Deck Open Deck Area	25,284 S.F.	19,950 S.F.
Cargo: Deck Load	2,050 P.S.F.	2,500 P.S.F.
D.W.T.	9,604 LTSW	7,236 LTSW

Maltese Cross A-1 Deck Barges

TANKS

Steel Skid-Mounted Liquid Storage Tanks. 10 Available.

Coast Guard Approved

Capacity	475 BBLS
Height	7'0"
Width	12'0"
Length	32'0"
Piping	Single fill pipe and distribution. Gravity Discharge. Valves and Manifold included.

CRANES

Whirley Crane

Model & Type	Clyde 37 DE-145-20 Whirley Crane
Manufacturer	Clyde Iron Works
Capacity	200 Tons
Main Hoist	Certified Rating of 400,000 lbs. @ 47' Radius; 150,000 lbs. @ 150' Radius. (16 part rigging)
Whip Tackle	2 part, 40,000 lbs. @ Radiuses to 160' max.

Excellent Condition

LIFT TRUCKS

Two Taylor Lift Trucks, Model TE 220S

22,000 lbs. Basic Capacity at a 24" Load Center.

Cummins Diesel Engine Model 6BT developing 151 HP at 2500 R.P.M.

Taylor 3-speed Power Shift Transmission. Separate transmission oil cooler.

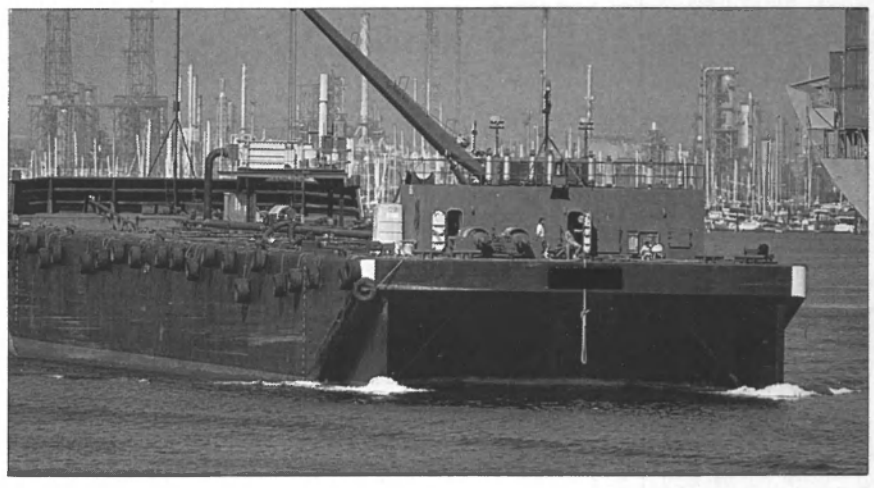
216" Lift Ultra View mast with an over-all lowered height of 168".

84" Wide Hydraulic side shift with 10" of total shift.

Fully enclosed cab with heater, defroster and front wiper.

MALTESE CROSS A-1 OIL TANK BARGE

Length	296'0"
Beam	60'0"
Depth	22'0"
Deadrise	6"
Number of Tanks	12
Total Tank Volumes at 95%	50,700 BBLS
Cargo Pumps	3 Rotary Twin Screw, Allweiler 231
Rating	1,500 GPM, 150 PSI, 1,200 RPM
Location	After Rake
Diesel Engines	3 Detriot Diesel 8V-71, 233 HP @ 1,800 RPM
Location	Engine Room on After Deck
Fuel Capacity	1421.3 Gal. Diesel
Fill & Discharge Connections	10" & 8"
Heating Coils	2" Sch. 80 Pipe Coils for Shore Steam Supply
Hull Plating	Side Shell 1/2", Bottom 7/16", Deck 1/2"
Deck Cargo Dwt. at Loadline	6761 LTSW



SPLIT TYPE SELF-DUMPING SCOWS

Length	180'0"
Beam	50'0"
Depth of Mid-Body	14'0"
Hopper Length	128'0"
Level Hopper Volume	1,421 cu. yd.
DWT @ d = 10.22 ft.	1,615 L.T.
Rake Lengths F. & A.	26'0"
Twin Skegs	
Stern & Fwd. Rake Decks Stepped up 2'0"	
Engine GM 671	

Hydraulic Pumps 12 GPM & 75 GPM	
Time to Open (Fully Closed to Fully Open)	6 Min. 5 Sec.
Time to Close	4 Min. 34 Sec.
Hopper Angle Fully Open	53.78 degrees
Fuel Tank Capacity	445 Gal.
Hydraulic Cylinders (2 Fwd. & 2 Aft)	18" Diam. 120" Stroke
Plating	Side, 9/16", Bottom, 5/8" Hopper, 5/8"

ZIDELL MARINE GROUP

For additional information or to make an appointment to inspect, write or call:
Sam Replin or Jack Breshears
3121 S.W. Moody Avenue, Portland, Oregon 97201
Phone: 1-800-547-9259, In Oregon (503) 228-8691 Fax: (503) 228-6750

Circle 286 on Reader Service Card

Nautronix Offshore Receives Contract For Automatic Heading Control Systems

Nautronix Offshore was recently awarded a contract to supply automatic heading control systems (AHCS) for the Australian Department of Defense. The units will be installed aboard the Royal Australian Navy's 'Bay' class minehunter inshore (MHI) vessels, HMA Rushcutter and HMA Shoalwater. The ASK4000 joystick control system will be supplied by Nautronix.

The ASK4000JS features a high performance digital processor, graphics display and interfaces for the ship's gyrocompass and wind sensor. Isolated interfaces will also be provided for both propulsion steering units (PSU), which are 360 degree, trainable fixed pitch, variable rpm propellers. The propellers are also controlled by the ASK4000JS.

The system reportedly provides for manually coordinated control of vessel heading, and control of vessel position, automatic computer control of the vessel's heading to maintain bearing and automatic wind compensation mode to provide correction for wind aerodynamic drag effects.

Some of the customized features to be provided with these units are a hover positioning priority mode for the occasion when maintaining position is more important than the vessel's heading, and a low revolution priority mode to reduce propeller noise implementation.

The system provides comprehensive alarms and performs continuous internal self testing.

Nautronix has designed the system with cost-effectiveness in mind. The systems provided to the MHI project can also be upgraded.

For further information about the ASK4000 systems offered by Nautronix Offshore,

Circle 156 on Reader Service Card

Stuart Named Regional Manager For Eltech International

Eltech International Corp., Houston, Texas, has announced that **Bernard A. Stuart** joined the company as regional manager of Europe, Africa and the Middle East.

Based in Geneva, Switzerland, Mr. **Stuart** will be responsible for establishing and maintaining customer relationships, as well as for developing new business throughout the territory.

Bernard Stuart

Prior to his appointment at Eltech, Mr. **Stuart** directed the opening of a solar energy plant in the Middle East for Photowatt International. He has more than 11 years of experience in the international solar energy industry.

Eltech International Corp. is headquartered in Sugar Land, Texas, with a branch in Geneva, Switzerland. It is a subsidiary of Eltech Systems Corp. of Boca Raton, Fla. The company is a leading supplier and manufacturer of environmental waste and water treatment products and processes for worldwide marine and land-based systems.

For more information about the services and products offered by Eltech International,

Circle 157 on Reader Service Card

Hagglunds Denison Appoints New Directors Of Marketing, Sales

The president of Hagglunds Denison, **Rune Back**, recently announced the appointments of two new directors of marketing and sales. **Ronald A. Sarbach** was appointed director of marketing and sales for the company's lines of hydraulic components and systems. **Frank W. Ratliff** was appointed to the same position in the company's hydraulic drives division.

Ronald A. Sarbach

Mr. **Sarbach** has 28 years of experience in the fluid power industry and was most recently Hagglunds Denison's worldwide piston products marketing manager. Mr. **Sarbach** was a design engineer when he joined the company in 1968.

Frank W. Ratliff

Mr. **Ratliff** recently joined the company after spending four and a half years at Anderson Drilling and Manufacturing of San Diego, which is a specialty contractor of large caissons. He served as vice president and general manager for the drilling and manufacturing divisions of Anderson. He previously served as western regional manager for two and a half years at Flender Power Transmission in Los Angeles and as western regional manager for Hagglunds Denison.

MacGregor-Navire Systems Specified For Mediterranean Ferries

Two leading Mediterranean ferry operators running RO/RO freight/passenger services between the southern French mainland and the island of Corsica, Societe Nationale Maritime Corse-Mediterranee (SNCM) and Compagnie Meridionale de Navigation (CMN) have specified that MacGregor-Navire RO/RO access/transfer systems be installed on their newbuildings.

CMN's newbuilding is booked at Finnyards for delivery during the summer of 1993, while the ACH yard at Le Havre will be building the SNCM ferry for delivery in early 1994.

The complete MacGregor-Navire shipsets will include twin axial stern ramp/doors; an internal ramp cover; a bow door/ramp with key operating elements; hoistable car decks and access ramps; an internal two-way hoistable ramp; and a large bulkhead door to isolate hazardous goods outside on the upper freight deck aft. The CMN ferry is specified with a guillotine-type bulkhead door, and the SNCM ferry with a Rolltite coiling-type door with drum stowage.

The associated hydraulic/electrical operating systems for the equipment will also be supplied by MacGregor-Navire along with pilot and bunkering doors.

For further information describing the equipment offered by MacGregor-Navire,

Circle 145 on Reader Service Card

Bender Awarded $598,613 MarAd Repair Contract

Bender Shipbuilding & Repair Company, Inc., of Mobile, Ala., recently commenced work on a $598,613 U.S. Maritime Administration (MarAd) contract for the drydocking and repair of the SS Gulf Trader. The 495-foot by 69-foot general cargo ship is based in MarAd's Ready Reserve Force (RRF) fleet in Beaumont, Texas. The work will be performed in 20 days and employ 50 workers.

Bender is a full-service shipyard that has built, converted and repaired vessels for commercial and governmental owners and operators for more than 70 years.

To receive free information about the services and facilities available from Bender Shipbuilding & Repair,

Circle 5 on Reader Service Card

ABS Reorganizes Its European Division

It was recently announced by **Robert D. Somerville,** the president and CEO of the American Bureau of Shipping's (ABS's) European division, one of the classification society's three marine operating divisions, that ABS Europe had been reorganized. "Due to the increasing involvement and prominence of the Middle East in marine-related activity, ABS has recognized a need to form a separate region dedicated to serving the special requirements of this important area. This change goes into effect August 1, 1992."

George Gardiakos will be the vice president responsible for ABS activities in the new Middle East Region, with the regional office likely to be located in either Bahrain or Dubai, United Arab Emirates.

Grinnell And Hopeman Brothers Offer Sprinkler, Fire Suppression Systems

Grinnell Corp. and Hopeman Brothers, Inc. have announced that the two companies have entered into an agreement to cooperate in the introduction of Grinnell's sprinkler and fire suppression systems to the worldwide marine market.

Grinnell is one of the world's largest fire protection groups and does business under such trade names as Grinnell, Wormald, Mather and Platt, Ansul, Total Walther, Parsch and O'Donnell Griffin. Grinnell specializes in new construction as well as the retrofitting of existing buildings and hotels. The company provides products for the retrofit including sprinklers, fire extinguishers, special hazards equipment, and inspection and maintenance of fire protection systems.

Hopeman Brothers is a leader in ship interiors, having already outfitted more than 3,000 vessels. The company will be responsible for introducing the products and services which Grinnell provides. Complete systems as well as material only sales will be offered. Grinnell's products and services are backed by engineering expertise from a network of more than 200 offices on five continents.

For more information from Hopeman Brothers Inc.,

Circle 64 on Reader Service Card

Markisches Werk Halver Offers Components For Gas And Diesel Engines

Markisches Werk Halver (MWH) manufactures components for use on gas and diesel engines. Among the products provided are inlet and exhaust valve spindles, valve seats, valve springs, valve guides, valve cages, valve rotators and completely assembled units. All of the products help to control the gas exchange in combustion engines. The company also offers a reconditioning service.

MWH manufactures the recently introduced valve rotator Turnomat. The company reports that extensive field tests on medium speed engines have demonstrated that the Turnomat valve rotator is cost effective. The installation ensures a longer life for the valve spindle.

For further information describing the products offered by Markisches Werk Halver,

Circle 152 on Reader Service Card

Matson Navigation's R.J. Pfeiffer from Nassco.

NASSCO Completes R. J. Pfeiffer For Matson Navigation

MV R.J. Pfeiffer constructed by National Steel and Shipbuilding Company (NASSCO) of San Diego and designed in collaboration with Odense Steelshipyard of Denmark represents the first contract for a large, ocean-going commercial ship to be awarded to any U.S. shipyard since 1984. The Hawaii II class containership recently completed for Matson Navigation will be used on the company's Pacific coast-Hawaii route.

Since January 1990, when the contract was signed, the process has involved nearly a year of detailed design work and 1.5 years of construction.

The 21,500-dwt R.J. Pfeiffer is designed for unrestricted, worldwide fast container service. The vessel has a draft of 34.5 feet and can reach a speed at 90 percent MCR of 22.5 knots. Propelled by a MAN B&W 8L8OMC, slow speed diesel, single screw main engine, with two B&W type NA-70 turbochargers, the ship is capable of producing 33,680 hp. MAN B&W licensee Kawasaki built the two stroke, eight-cylinder engine, which stands nearly four stories high and weighs 992 tons. Ulstein Maritime provided the thrusters. The five-blade, moderately skewed, fixed pitch propeller, which measures 7.72 m in diameter, was manufactured by Thyssen Rheinstahl, which also supplied the ship's shafting.

Wartsila Vasa was chosen to provide the ship's three 2,000-kW, three-phase service diesel generators, as well as the 500-kW back up generator.

The auxiliary boiler and exhaust economizer both come from Senior Green, the former being a 7,500 lb/hr, 102 PSIG unit; the latter a 5,800 lb/hr., 102 PSIG unit.

The steering gear, supplied by Anschutz of America (Frydenbo), is an electro-hydraulic, four cylinder ram type. The 1,600 hp electro-hydraulic bow thruster has a variable pitch impeller and was provided by Ulstein Maritime.

Norcontrols provided the engine controls, which allow remote control and monitoring of machinery. Propulsion machinery can also be controlled from the bridge.

Navigation equipment, primarily supplied by Sperry Marine Inc. and Raytheon Services Co. includes: radar/collision avoidance system; gyro compass; echo sounder; doppler speed log; satellite navigation system; Loran C; and a radio direction finder.

Mackay Communications supplied the autopilot, as well as the VHF and SSB radio equipment.

The containership, which measures more than 713 feet long and 105 feet wide, has a design capacity of 1,650 TFEU (24-ft.-equivalent units) or 1,400 TFEU plus 125 40-foot auto frames (FAFs). A maximum of 1,910 TFEU (or 1,650 TFEU plus 130 FAFs) may be achieved through four-tier on-deck container stacking.

Refrigerated containers may be stowed in the holds and on five of 16 on-deck container rows. Holds are closed by watertight pontoon hatches, designed by MacGregor Navire, which were designed for stacking on adjacent covers. A water fire extinguishing systems covers the deck and accommodations, while a CO_2 fire extinguishing system is in all cargo and machinery spaces.

The deck equipment from Ulstein Norwinch feature two horizontal shaft type anchors and mooring windlasses mounted on separate bed plates.

The anchors are two lightweight AC-14 type. Other equipment includes: centrifugal pumps by Weir Pumps, Ltd.; rotary pumps by McKenna Eng. & Equipment; air conditioning and s/s reefer by York; HVAC & machinery fans by Buffalo Forge; joiners by Hopeman Brothers; switchboards by Point Eight Power Inc.; elevator by Jered Brown; electric motors by Reliance; heat exchangers by ITT Standard; and purifiers by Alpha Laval

The ship was finished using coatings from International Paint, with Ameron providing the supplies for the bottom coating.

For free literature detailing the vessel construction capabilities of NASSCO,

Circle 148 on Reader Service Card

Swedish Yard Receives 2nd Catamaran Order

Oskarshamns Varv AB shipyard, of Oskarshamns, Sweden, a member of the Swede Ship group, recently received a second order from the ferry operator Brudey Freres, Guadeloupe, for a high speed catamaran car and passenger ferry.

Scheduled for delivery in spring 1993, the Catamaran W5000 will seat 300 passengers on two decks and carry 35 vehicles or light cargo on its single car deck with stern ramp.

Four KaMeWa water jets, each connected to a MTU diesel engine of 2,000 kW, give the catamaran a service speed of 30 knots.

The ferry is 162.2 feet in length, has a 45.9-foot breadth and is constructed of all-welded aluminum, making her one of the largest aluminum vessels in Europe.

For the past two years Swede Ship group has been developing and marketing its line of Jumbo Cats, the largest of which, the 45-knot W12000, has a 1,000-passenger and 300-car capacity.

For more information about Oskarshamns shipyard,

Circle 1 on Reader Service Card

IMO Pump Overhauls One Of World's Largest Rotary Screw Pumps

Monroe, N.C.-based IMO Pump Division, of Imo Industries, Inc., recently announced that it has completed the overhaul of one of the world's largest rotary geared twin screw (GTS™) pumps.

IMO Pump's vertical deep-well screw pump.

Designed and manufactured by IMO Pump Division, the unit has a pumping capacity of 5,000 gpm at pressures to 150 psi.

Including the pump, vertical column and drive gear assembly, it is 63 feet long and weighs approximately 40,000 lbs. The pump was specifically designed for shipboard installation to off-load crude oil cargoes from tankers. After nine years of shipboard service, the unit required only a minor overhaul and no replacement of major components.

One of the world's largest designers and manufacturers of rotary screw pumps, IMO Pump Division also manufactures a three-screw rotary design and crescent internal gear (CIG®) pumps, all supported by factory or field servicing.

For free information about IMO Pump Division's product lines,

Circle 2 on Reader Service Card

Kobelt Offers Electronic Rudder Angle Indicator

Kobelt Manufacturing Company, Ltd., of Richmond, Canada, is offering a new electronic rudder angle indicator that will allow crewmen to instantly and continuously monitor rudder position.

A basic system consists of a master station display and a follow-up unit. Up to six remote units can be installed where multiple readout stations are desired and the rudder angle indicator is compatible with most other units on the market.

Both master and remote units are splashproof and feature translucent backlighting for night operation. Only 1 watt of power is needed to operate the unit's circuit board.

To receive additional information about Kobelt Manufacturing's new rudder angle indicator,

Circle 3 on Reader Service Card

Douglass Offers Flame Resistant Fabric Line

Douglass Industries recently introduced its flame resistant Master Works line of upholstery fabrics. The new line is comprised of three patterns in a total of 18 colorways. These woven upholstery fabrics are in blends of wool/nylon, wool/cotton/polyester, and wool/cotton/nylon.

All of the fabrics meet California Bulletin Class 1 standards for flame resistance. As custom options, Douglass offers additional flame resistant treatments that enable these fabrics to meet other specific fire codes.

For complete information and samples of the flame resistant fabrics offered by Douglass Industries,

Circle 49 on Reader Service Card

Iveco Aifo Marine Diesel Engines To Be Marketed In US By Lister-Petter

Lister-Petter Inc., of Olathe, Kansas, has announced that they have been appointed the distributor for Iveco Aifo's marine diesel engines in the United States . Iveco Aifo is located in Milan, Italy.

The agreement between the two companies will cover the full range of Iveco Aifo products, including marine diesel engines up to 1,200 hp, diesel-engined generator sets up to 450 kW and all associated parts and accessories.

According to the president of Lister-Petter, **Noel Ashworth:** "We are very pleased that we have been able to establish this association with such a notable diesel engine producer. Iveco's product range complements that of Lister-Petter, which historically has been concentrated in the lower horsepower range."

Lister-Petter manufactures air- and water-cooled diesel and natural gas engines, Hawkpower generating sets and Seahawk™ marine engines, serving a wide variety of markets.

For further information from Lister-Petter,

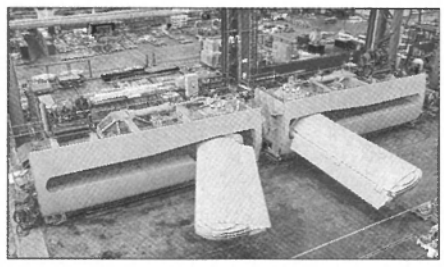
Circle 172 on Reader Service Card

Blohm+Voss Produces Simplex-Compact Fin Stabilizer For Finnyards

The mechanical engineering division of Blohm+Voss recently produced one of the world's largest Simplex-Compact fin stabilizers. The order was place by Finnyards Ltd. of Finland.

The SK 50-366-92 type fin stabilizers will be installed on a RO/RO passenger vessel being built at the yard for Compagnie Meridionale de Navigation.

Each of the fins has a surface area of about 55 square feet and a total weight of about 195 tons.



Fin stabilizers built by Blohm+Voss

The RO/RO is scheduled to be delivered in mid-1993.

For more information describing the services and products provided by Blohm+Voss,

Circle 173 on Reader Service Card

MSC Awards $9.5 Million In Contracts To Carriers For U.S. To Alaska Cargo

Contracts for the ocean and intermodal transportation of government cargo between the continental U.S. and points in Alaska via common carrier were recently awarded to five companies by the U.S. Navy's Military Sealift Command (MSC) Central Technical Activity.

The new contracts will go into effect on September 1, 1992 and end on August 31, 1993. The estimated cost of the new contracts is $9.5 million, which is based on the cost of the current contracts.

Four of the companies that received new MSC contracts are presently transporting cargo under the current contract: Totem Ocean Trailer Express, Inc., Seattle, Wash.; Alaska Hydro-Train, Seattle, Wash.; Samson Tug & Barge Company, Inc., Sitka, Alaska; and Sea-Land Services, Inc., Edison, N.J. The fifth company that was awarded an MSC contract is the only new participant in the program, Alaska Cargo Transport, Inc., of Seattle, Wash.

Comsat To Provide Global Safety Service To Ships Without Charge

Comsat Mobile Communications recently announced its new procedures for distress and safety calls through its land earth stations from ships at sea over the global Inmarsat system. Comsat customers will now be able to use special service codes for emergency transmissions from Inmarsat-A or -C terminals without charge, as part of the Global Maritime Distress and Safety System (GMDSS).

Comsat, the U.S. signatory to Inmarsat, will be implementing the recent joint agreement by the International Maritime Organization (IMO) and Inmarsat that established new procedures for charging for distress and safety messages carried by the Inmarsat system.

The land earth stations which will handle these transmissions are in Southbury, Conn., Santa Paula, Calif., and Anatolia, Turkey.

Vessels must dial "01" for Comsat's land earth stations and use the prescribed two-digit service codes to identify the calls as distress and safety calls. All calls would automatically be sent to the U.S. Coast Guard Rescue Coordination Centers for assistance.

Comsat claims that the GMDSS procedures link search and rescue authorities ashore with a ship in distress or in need of assistance. The GMDSS system was established to provide ships around the world with the communications tools to provide for the safety of crew, passengers and cargo, as well as to allow for urgency and safety communications including the distribution of navigational and meteorological warnings.

Harris Corp. Wins $27.7 Million Navy Contract

Harris Corporation has been awarded a multi-million dollar contract from the U.S. Navy for new AN/URT-23 remote controllable radio transmitters and associated accessories. The contract was awarded to Harris' RF Communications Group by the U.S. Navy Space and Naval Warfare Systems Command (SPAWAR). The initial contract is for $11.7 million, with options bringing the total to $27.7 million.

The AN/URT-23 is a digitally tuned, remote-controllable shipboard HF transmitter which provides voice, continuous wave (CW), radio teletype (RATT) and Link 11 data communications. The equipment is designed to support automatic link establishment (ALE) capability.

For more information on Harris,

Circle 137 on Reader Service Card

A&J Manufacturing Offers Unique Electronic Enclosures

A&J Manufacturing, Tustin, Calif., has announced that it is offering electronic enclosures which have reportedly already been installed aboard all classes of U.S. Navy vessels, Canadian frigates and a large number of select foreign vessels.

The company is a leading supplier of shipboard electronic enclosures. The enclosures are made from aluminum and the company has a unique method of bolted-construction. A&J claims that its proprietary design and construction techniques eliminate the need for welding, riveting or dowel pins in order to provide the highest strength to weight ratio available. The military has reportedly accepted this construction technique for its ease of assembling and disassembling in constricted and hard-to-get-at spaces.

The shipboard enclosures are shielded (EMI/RFI) and modular in design. They are reported to be qualified from 4 to 50 Hz of vibration. A&J claims that its quality control system has been approved by the Department of Defense and other customers such as Rockwell International, General Electric, Litton, General Dynamics and GTE Sylvania.

The company also offers test reports pertaining to the shock and vibration tests performed on the enclosures.

For literature detailing the shipboard enclosures offered by A&J Manufacturing,

Circle 46 on Reader Service Card

Ameron Introduces Amercoat 3207/385, Marine Coatings System

Ameron, a leader in environmentally designed, high-performance coatings, recently introduced Amercoat 3207, a water-based epoxy preconstruction primer ideal for use with high-solids Amercoat 385 multi-purpose epoxy for underwater hulls, tanks and topsides. The Amercoat 3207/385 combination is reported to be one of the most versatile, unique marine coatings systems for new construction in the world.

VOC-compliant Amercoat 3207 has been tested and used successfully in several major U.S. shipyards, including the Avondale Shipyard in New Orleans, La. Avondale has reported that they have experienced environmental problems with zinc-rich preconstruction primers that have polluted the water around the shipyard. Through testing, Avondale technicians have found Amercoat 3207 to be an environmentally safe, high-performance alternative to zinc primers.

Amercoat 3207 is a weldable, corrosion-resistant primer for all industrial steel plate and shape applications. Available in 300-gallon disposable totes, Ameron claims that it dries quickly and can be thinned and cleaned with water.

For more information about Amercoat 3207/385

Circle 56 on Reader Service Card

Hoffer Flow Controls Offers *Star* Series Of Turbine Flowmeters

Hoffer Flow Controls, Inc. recently announced that it is now offering its *Star* Series of industrial grade turbine flowmeters. This series offers four sizes that are ready for delivery within 10 working days.

The flowmeters are designed and manufactured for measuring liquids with accuracies of one percent or better and repeatability of 0.1 percent. The flowmeters are made of stainless steel and are reported to be rugged, accurate and dependable.

Hoffer also offers a full line of precision turbine flowmeters for liquid and gas applications.

For a free copy of the product bulletin detailing the *Star* Series flowmeters from Hoffer Flow Controls,

Circle 9 on Reader Service Card

SI-Tex Marine To Sell And Service Koden Products in North America

Koden Electronics Co., Ltd of Tokyo announced the consolidation of marketing operations of Koden International, Inc., of Norwell, Mass., and SI-Tex Marine Electronics, Inc., of Clearwater, Fla., announced **F.Y. Ito,** president of Koden in Tokyo.

Effective September 1, SI-Tex assumes total responsibility for the sales and service of all Koden marine products in North America.

Also, **Ted Hansford**, president and CEO of SI-Tex, will assume complete marketing responsibilities for both the SI-Tex and Koden product lines in North America, Mr. **Ito** said. Both product lines are navigation and fishfinding electronics marketed to the marine industry. Most sales of SI-Tex products are to the consumer boating market, while commercial fisherman are the primary buyers of Koden equipment.

For more information,

Circle 32 on Reader Service Card

Oil Skimming Explained In Free Brochure

Abanaki Corporation, which has more than 25 years experience in oil removal in a wide variety of industrial and environmental applications, is offering "Oil Skimming Facts," a 14-page folder that provides answers and application information for many of the most encountered questions and situations.

The information explains the principles of skimming, the advantages and drawbacks of different types of skimming devices, and points out how to avoid many common problems users encounter.

Abanaki also offers a complete line of skimmers and related equipment, ranging from portable models with a capacity of four gallons per hour to systems with capacities up to 200 gph.

For a copy of the brochure and information on Abanaki's complete product line,

Circle 27 On Reader Service Card

Dimetrics Introduces Gold Track III Welding System

Dimetrics, Inc., Davidson, N.C., has introduced its Gold Track III, computer-controlled GTAW pipe welding system. The system is reportedly designed to ensure high-quality, repeatable welds in a wide variety of orbital pipe and tube, or linear applications.

The system provides a 300-amp maximum output at 20 volts. The unit's four systems include wire feed, travel, oscillator and arc voltage control and are all under control of an on-board programmable computer. The starting mode is weld head selectable, and operation may be via the high-voltage impulse arc starter or touch-start using computer programmed parameters.

The operators console includes user friendly computer displays as well as override controls. The system also includes a handheld full function remote operator terminal.

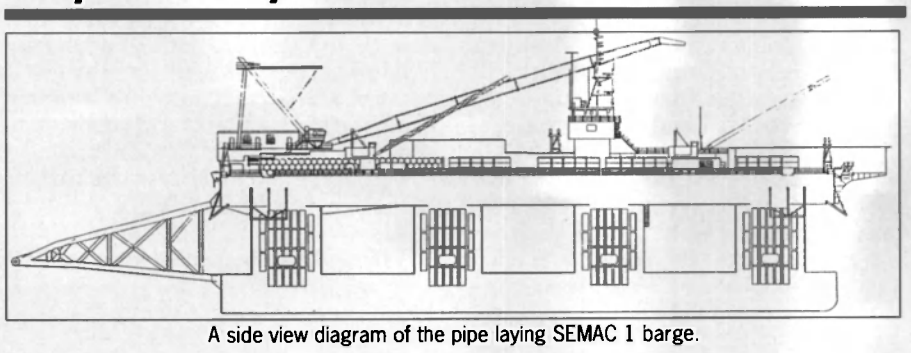
Dimetrics claims that as many as 16 welding procedures containing up to 12 segments each can be stored in the system's internal memory, and unlimited external weld-procedure storage—plus convenient machine-to-machine data transfer—is available through Dimetrics' Welding Data-Pak™ plug-in memory cartridges.

Other features of the system include a built-in 1.8-gallon torch coolant system with heat exchanger, an inert gas control system, computer-interactive arc voltage control (ARC), and oscillator controls with synchronized pulsing capabilities. The system also offers Gold Track II capability and can be used with all Dimetrics pipe and tube welding heads.

The Gold Track III power supply is available as an upright rack unit and a low-profile dual-bay unit. Optional equipment includes a printer, strip chart recorder, remote video viewing system and additional Welding Data-Pak™ cartridges.

For free literature detailing Dimetrics' Gold Track III welding system,

Circle 77 on Reader Service Card



A side view diagram of the pipe laying SEMAC 1 barge.

Siemens Outfits Pipe-Laying Barge With Electric Drive System

When the pipe lay barge SEMAC 1 underwent a conversion from a hydraulic to an electric drive system, with a power increase, for its tensioners and A/R winch, owner European Marine Contractors (EMC) chose Siemens Electric Ltd. of Montreal, Canada for the job.

The 145-meter long semi-submersible barge lays gas and oil pipe lines under the sea. Prefabricated joints are welded to the pipeline in round-the-clock operation. Anchor winches move the barge forward in the rhythm of the welding operation, and the barge can lay pipe at a top speed of 2.5 miles per day.

The barge's high cost of operation and tight schedules demand that pipe handling equipment be reliable, efficient and operator friendly; all conditions which are satisfied with state-of-the-art electrical drive systems. For the complex project, Siemens supplied DC motors, converter- and control-cubicles, operator consoles, low- and medium-voltage switchgear and dry-type power transformers.

For the tensioners, three caterpillar-type drives hold the pipe at a constant tension, regardless of barge movements. The tensioners are rated 75 tons each and are designed for a maximum pipe laying speed of 36 meters per minute. The upper and the lower tracks of the tensioners are each driven by a 290 kW DC, blower ventilated motor.

The double-drum abandonment/retrieval winch is driven by four DC motors of 320 kW each, and operates in conjunction with a 250 kW spooling winch. Rated at 275 tons, the winch can handle wires up to four inches at a maximum speed of 44 meters per minute. It serves for the laydown and the recovery of the pipeline on the sea floor.

The tensioners and the winches can be operated in tension- and in speed-control mode from local control stations and from two main operator desks. For the tensioners, an additional position control mode is implemented, which achieves increased pipeline stability, important at rough sea conditions.

The common control system for the tensioners and A/R is a closed-loop system built-up with a modular analog system, located in 19-inch racks. This type of control makes it possible to smoothly transfer the pipe from one system to the other, without applying the brakes and losing control over the holding tension in the pipeline. This proves an important feature, especially at bad weather conditions, which often dictates the laydown of the pipe.

All digital signals are processed by a centralized programmable controller system, which is interfaced with the analog controls. Because control cubicles and desks are distributed all over the ship, electronic terminators for local input/output signals are used which are connected by a two-wire ring cable to the central controller. This configuration requires a minimum of cabling and reduces installation, engineering and commissioning costs.

The flexibility of the programmable controller with regard to implementation of modifications, commissioning procedures, etc., is an advantage over conventional hard-wired controls.

Due to the flexibility of the controls the drives could be commissioned within a very short period of time.

The barge resumed operation in spring of 1991, after going in for conversion in late 1990, and has layed hundreds of kilometers of pipeline of different sizes since.

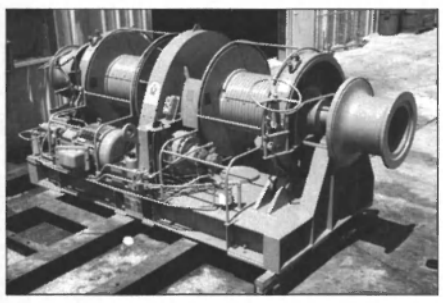
A further advantage of electric drives is their energy-efficiency. Higher amounts of active power, which result in increased fuel consumption on the diesel power plant, are only required during the short intervals of barge movement. As a matter of fact, energy is even regenerated by the tensioner drives when the barge is pulled ahead.

For more information on the products and services provided by Siemens Electric Ltd.,

Circle 38 On Reader Service Card

McElroy Machine Delivers Mooring Winch To Maritime Overseas Corporation

McElroy Machine and Manufacturing Co., Inc., Biloxi, Miss., recently delivered its seventh mooring winch to Maritime Overseas Corporation. The winch is reported to be totally self contained with a double drum, electro-hydraulic unit capable of developing 60,000 pounds or more of line pull and 100,000 pounds of brake holding power. The winch is to be installed aboard the 875-foot tanker Overseas Washington.



Mooring Winch Built By McElroy Machine

McElroy has obtained contracts from Bender Shipbuilding for 20 trawl winch packages to be installed aboard the Kuwaiti vessels being built at the yard. Bender has also placed other orders for many of the vessels being built for various customers at its Mobile, Ala., shipyard.

Trinity Marine placed an order for a third double anchor windlass for the T-AGS 60, 61 and 62 being built at their Halter, Moss Point yard. They also ordered two stern anchor winches for the Army LSVs under construction and Moss Point Marine.

Other yards or companies placing orders include Sause Bros. Ocean Towing, Texas A&M University and Steiner Shipyard.

McElroy Machine supplies equipment for a wide range of vessels including offshore supply boats, utility boats, tugs, fishing vessels, U.S. Coast Guard vessels, U.S. Navy vessels, Army Corps of Engineers and foreign navies.

For further information describing the equipment provided by McElroy Machine,

Circle 78 on Reader Service Card

Sea-Hornet Announces Vessel Monitoring And Control System

Sea-Hornet Marine Industries has introduced its V-MAC 3301 vessel monitoring and control system. The system is reported to be a powerful, flexible, micro-processor driven system which can monitor and control a variety of functions and conditions onboard power, sail and commercial vessels.

The V-MAC monitors a vessels engines and provides visual and audible warnings if necessary. The system also monitors pumps and in cases where a high-water level is detected, it will sound an alarm and attempt to activate the pump in the flooded compartment.

V-MAC is designed to protect the vessel by asking for identification before allowing anyone to start the engines. If V-MAC detects dangerous gases in the engine compartment it can disable the ignition system, sound an alarm, issue a visual warning message and turn on the blower.

The basic system consists of two compact components which are the control panel and a functional keypad with built-in LCD display. The systems are preprogrammed at the factory but can be customized to meet individual needs.

For further information about the V-MAC vessel monitoring and control system from Sea-Hornet,

Circle 79 on Reader Service Card

Boats & Barges

The Jet Express II, shown with her sistership the Jet Express, in service on Lake Erie.

Gladding-Hearn Delivers High-Speed Ferry For Lake Erie Service

Gladding-Hearn Shipbuilding, The Duclos Corp., recently delivered its fourth high-speed passenger ferry for service on the Great Lakes. Since becoming a licensee of Australia's Incat Design in 1986, this is the eighth catamaran ferry that the shipyard has built.

The M/V Jet Express II was delivered to the Put-In Bay Boat Co. of Put-In Bay, Ohio. The 98-foot vessel is the company's second international catamaran built by Gladding-Hearn.

The 395-passenger vessel will provide seasonal ferry service between Put-In Bay on Lake Erie's South Bass Island and Port Clinton, Ohio. The Jet Express II joins the 93-foot Jet Express which was delivered in 1989 and will reportedly more than double the operator's daily excursion service to Put-In Bay, a resort community.

Both vessels are reported to be able to make the 12-mile trip in about 20 minutes.

The Jet Express II is powered by twin 1740 bhp Deutz MWM diesel engines and driven by two KaMeWa water jets. A speed of 32 knots can be obtained when fully loaded and is equipped with hydraulic adjustable trim tabs.

The Jet Express II was designed specifically for navigating over the shoals which surround Port Clinton. The water jets reportedly raise the catamaran's draft from 7.5 feet, which is typical with conventional subcavitating propellers, to about 3.25 feet.

The all-aluminum vessel features three passenger decks with upholstered seats, which were made by Gladding-Hearn and Norwegian Georg Eknes, and a large cargo deck. The wide aisles and coamingless doors, folding seats, large head and wide flip-down gates reportedly make the vessel easily accessible to disabled passengers.

Other vessels which are presently under construction at Gladding-Hearn include a 65-foot pilot boat for the San Francisco Bar Pilots, a fire boat for the New York City fire department and a monohull, high-speed passenger ferry for an operator in the City of New York.

For further information describing the shipbuilding capabilities of Gladding-Hearn Shipbuilding,

Circle 13 on Reader Service Card

JET EXPRESS II
Equipment List

Main Engines	Deutz MWM
Water Jets	KaMeWa 63 S 2
Engine Controls	KaMeWa
Gansets	Lister
Radar	Raytheon
VHF	ICOM
Loran	Micrologic Explorer
Compass	Plath

For more information,

Circle 153 on Reader Service Card

Propulsion Update

Schottel Offers 20-Page Propulsion Technology Brochure

The International Schottel Group offers worldwide sales and service with its headquarters located in Spay/Rhein, Germany.

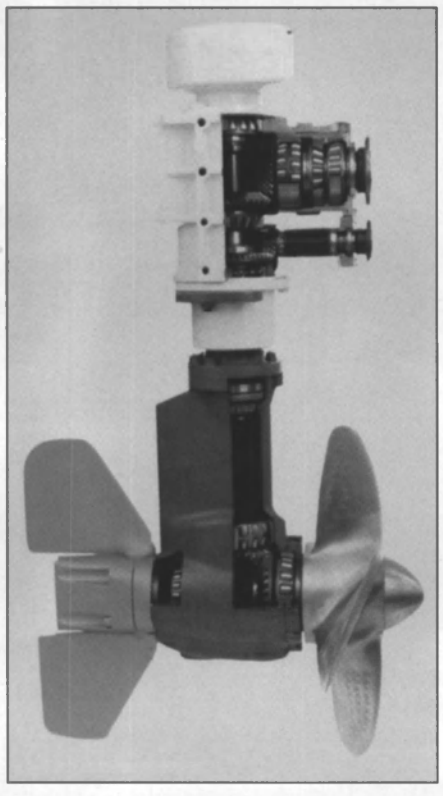
A free 20-page full color brochure is available from Schottel. It describes, with text and color pictures, the wide range of propulsion equipment parts and support services offered by Schottel throughout the world—Rudderpropellers, thrusters, jet propulsion, pump jets, cone jets, steering and control systems, clutches, etc.

For over 70 years Schottel has been bringing its customers reliable and economical propulsion systems. Perhaps the best known Schottel system is the Rudderpropeller which is a combined propulsion and steering unit. With this system the propeller can be rotated through 360 degrees in order to provide full thrust in any direction. This system has been in use throughout the world for over 35 years. The units which are currently available range from 15 kW to 5,000 kW (20 hp to 7,000 hp). Schottel Rudderpropellers are in service for main propulsion, propulsion assistance and dynamic positioning in all fields of shipping. It is available to be fitted steerable or non-steerable, retractable or non-retractable, for vertical or horizontal drive and with fixed or controllable pitch propellers.

Schottel also manufactures various type of heavy-duty jet propulsion systems designed specifically for shallow-draft propulsion. The Pump-Jet has a pump wheel rather than a propeller in order to be able to install the system flush with the bottom of the vessel. The Pump-Jet is reported to be able to operate in depths of water as shallow as four inches. The Cone-Jets were developed as a main drive or for a bow maneuvering aid for vessels such as ferries, motorized cargo vessels and barges. The unit is equipped with a propeller rotating at a 25 degree angle which forces the water into an elbow which can be rotated about a vertical axis through 360 degrees.

The Schottel Navigator is a complete propulsion package, also available in a sound-proofed version. These units can be constructed to serve as a fuel tank and also house the entire propulsion system. Power is transmitted between the engine and the Rudderpropeller through the use of a Schottel clutch.

Various L- and Z-versions of the Schottel Transverse Thruster can be made to reflect individual requirements for different types of vessels. The Transverse Thruster



Schottel's Rudder propeller

can be made with an adjustable pitch propeller to fit engine output and hull form.

Schottel's steering and control systems were developed to fit each of the various propulsion systems. Some of the steering systems offered are handmechanical, follow-up, remote-control (Copilot 2000) and computer-controlled steering systems for ships (Schottel Masterpilot). The system can also come equipped with Schottel's alarm system which monitors the entire propulsion plant.

Brunvoll A/S Specializes In Thruster Systems—Literature Available

Brunvoll A/S of Norway has been manufacturing thruster systems for over 80 years.

Brunvoll thruster systems have been installed aboard Carnival Cruise Lines "Fantasy" class cruise ships, the SSC Radisson Diamond and the Royal Viking Queen.

The company has developed a patented low noise concept for thrusters which implements a fully resiliently mounted thruster tunnel with no direct steel connection between the thruster tunnel and the ship's structure. The thrust force and weight of the unit are transmitted to the supporting structure by rubber mounts. The unit is sealed off to the sea and hull by double highly flexible rubber seals.

Brunvoll recently was awarded a contract to supply six of its bow thrusters to three combined cruise passenger/cargo ferries being built by Volkswerft Stralsund/Meyer Werft in Germany for the Norwegian express services, Hurtigruten. All six units are expected to be delivered to the yard within a period of six months.

For literature detailing the products and services offered by Brunvoll A/S

Circle 80 on Reader Service Card

Lone Star Responder built by Bender Shipbuilding.

Bender Shipbuilding And MSRC Launch Lone Star Responder, Fourth Spill Vessel

Bender Shipbuilding & Repair Co., Inc. of Mobile, Ala., recently announced that it has joined the Marine Spill Response Corporation (MSRC) in launching the 210-foot Lone Star Responder, the fourth oil spill recovery vessel in MSRC's planned 16-vessel national fleet.

Bender was awarded a $50 million contract to build four oil spill recovery vessels for MSRC. In addition to the Lone Star Responder, which will be stationed at Corpus Christi, Texas, Bender is also building the Gulf Responder, the Louisiana Responder and the Texas Responder. All four vessels are expected to be completed by February 1993 and will be stationed in the Gulf of Mexico.

Designed by Bender engineers, the Lone Star Responder will be equipped with an advanced oil recovery system of skimmers, booms and separators capable of recovering major oil spills, both close to shore and in the open ocean. The vessel will have tanks to hold 4,000 barrels of recovered oil. Once recovered, the oil will be pumped into barges or floating bladders for disposal onshore.

The Lone Star Responder was launched using two 600-ton floating barge cranes supplied by Bisso Marine Co. of New Orleans, La. The two barge cranes, positioned in the Mobile River, lifted the 210-foot vessel from the riverbank as tugs backed the cranes away from the bank. The cranes then placed the hull into the water.

One of the cranes then moved up the river, lifted the vessel's superstructure, brought it down the river and placed it onto the hull. The hull and superstructure were built as separate modules, using the latest techniques in modular construction. With the main portions of the vessel now in place, construction and equipment outfitting on the vessel will continue through the fall.

Founded in 1919, Bender Shipbuilding & Repair Co., Inc. is a full-service shipyard that builds, converts and repairs vessels for commercial and government owners and operators.

For more information describing the services and facilities provided by Bender Shipbuilding & Repair,

Circle 159 on Reader Service Card

Statoil Predicts Offshore Drilling To Continue Through Turn Of Century

Statoil has predicted that Norway will probably experience a steady rate of offshore drilling through the turn of the century. **Johan Vold,** vice president of Statoil claims that the company expects to drill about 35 exploration wells each year off the coast of Norway in the North Sea.

At the present time reports indicate that Statoil would like to keep its long term oil price at about $20 per barrel without a projected increase for the remainder of the 1990s.

Auto-Gen Turns Engine Power To AC Electricity

Power from a boat's main engine can be converted to onboard AC electricity with installation of the Auto-Gen M4002 cruising generator. It is a fuel-saving alternative to gas-powered generators, or an emergency back-up power source.

Driven by the engine's crankshaft pulley, the M4002 provides 4,250 watts of 120/2400 AC power. Its compact size and unitized frame allows installation in nearly any position. A bi-directional rotation makes either starboard or port-side mounting convenient. If direct connection to the crankshaft is not possible, the Auto-Gen can be driven by any accessible pulley which offers adequate speed and belt size.

The unit is outfitted with a variable speed drive transmission which adjusts automatically to a change in the engine's rpm's. As a result, the generator provides a constant and balanced output. The M4002 weighs 125 pounds.

For more information on Mercantile Manufacturing Co.'s line of generators,

Circle 29 on Reader Service Card

Litton Canada Wins $10 Million Contract

Litton Systems Canada, Limited, Etobicoke, Ontario, has been awarded a contract worth over $10 million to design, produce and support two new sonar post-analysis systems for the Canadian Navy.

When completed in 1995, one system will be installed in the Acoustic Data Analysis Center (ADAC) in Halifax, Nova Scotia, and the other in the ADAC Detachment Esquimait, British Columbia.

The post-analysis systems will be designed to enhance the Canadian Navy's capability to analyze the vast amounts of data recorded on its ships using Canadian towing array sonar.

Litton claims its new systems will process the data many times faster than current operational equipment.

Henschel Creates New Division, Names Roussinos Manager

Henschel, Inc. of Newburyport, Mass., recently annonced the formation of a new Commercial Department. The Commercial Department's main focus will be on Alarm, Control and Communications (ACC). Henschel Commercial or Henschel ACC as it will be known, will bring existing products along with new developments for the consumer. **Don S. Roussinos** has been appointed manager of the new department. As head of the Commercial Department, Mr. **Roussinos** will be focusing on delivering Henschel's equipment to the commercial marine community.

For free information on Henschel,

Circle 178 on Reader Service Card

Circle Seal Controls Offers Free Brochure On Pneumatic Service Carts

Circle Seal Controls, Inc., of Anaheim, Calif., is offering a four-page color brochure on its CTR 100, single system circuit, and CTR 200, separate high and low pressure circuits, Pneumatic Service Carts.

The carts provide complete portable pneumatic test and charging supply systems for applications such as servicing aircraft tires, struts, accumulators and general pneumatic test functions. Each charge cart accommodates two standard ICC bottles rated up to 6,000 PSI.

Charts to assist the customer in ordering the carts are provided, followed by a series of highly detailed line drawings showing the dimensions and gauge arrangements, circuit diagrams and a specifications chart for each type of cart.

To receive Circle Seal Controls' free brochure on its Pneumatic Service Carts,

Circle 39 on Reader Service Card

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
Barton Mines Corp., 1658 Cole Blvd., Golden, CO 89401
Bourg Drydock, P.O.Box 1852, Houma, LA 70361
Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Ervin Industries, Inc., 3893 Research Park Drive, P.O. Box 1168, Ann Arbor, MI 48106-1668

AIR CONDITIONING AND REFRIGERATION—Repair & Installation
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Carrier Transicold, P.O. Box 4805, Syracuse, NY 132211
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Stal Refrigeration AB, Butangsgatan 16, S-601 87 Norrkoping, SWEDEN

BALLAST
Chesapeake Specialty Products, 5055 Northpoint Bivd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., P.O. Box 986, Sonoita, AZ 85637

BARGE BUILDING
Conrad Industries, P.O. Box 790, Morgan City LA 70381
Maxon, South Boundary Street, P.O. Box 69, Tell City, IN 47586
Zidell Marine Corp., 3121 S W Moody Ave., Portland, OR 97201

BARGE COVERS
Syntechnics Inc., FRP div. 700 Terrace Lane, Paducah, KY 42003

BARGE—Leasing
McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell Marine Corp., 3121 SW Moody Ave., Portland OR 97201

BASKET STRAINERS
Beaird Industries, P.O. Box 31115, Shreveport, LA 71130

BEARING—Rubber, Metallic, Non-Metallic
B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orkot Engineering, 2535 Prairie Road-Unit D, Eugene, OR 97402
Thordon Bearings Inc.., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

BOILER—Manufacturers
Aalborg Ciserv (Miami) Inc., 2449 Northeast 13th Avenue, Ft. Lauderdale, FL 33305

BROKERS
151 Maritime Services, 34062 El Encanto/B, Dana Pt. CA 92629
Captain Astad Company, Inc., P.O. Box 350486, Ft Lauderdale, FL 33335,
2900 Energy Centre, 1100 Poydras Street, New Orleans, LA 70163-2900
Diversified Marine Brokerage, 1201 Northern Blvd., Manhasset, NY 11030
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
Crowley Maritime, 155 Grand Ave., Oakland, CA 94612
Zidell Marine Corp., 3121 SW Moody Ave., Portland OR 97201

CABLE ASSEMBLIES
Revere Aerospace, 845 N. Colony Rd. Wallingford, CT 06492

CARGO HANDLING EQUIPMENT
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108

CHAIN
Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
G.J. Wortelboer Jr. B.V., Postbus 5003, 3008 AA Rotterdam, NETHERLANDS

CHEMICALS
Unitor Ships Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

CLAMPING—Pipe, Tubes, Hose
ZSI, 12749 Richfield Ct., Livonia, MI 48150

CLASSIFICATON SOCIETY
American Bureau of Shipping, 2 World Trade Center, 106th Floor, New York, NY 10048

COMPACTORS
A/S Vesta, Skudehavsvej 27, DK-2100 Copenhagen, DENMARK;
Sales Agents: American United Marine Corp., 5 Broadway, Rt 1,
Saugus, MA 01906, USA

COMPOUNDS
ITW Philadelphia Resins, 130 Commerce Dr, Montgomeryville, PA 18936

COMPUTERIZED INFORMATION SYSTEMS
Coastdesign, Inc., Unit 201, 12837 76th Avenue, Surrey, BC CANADA V3W 2V3
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
Wright Austin Co., 3250 Franklin St., Detroit MI 48207

CONTROL SYSTEM—Monitoring
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Autronica Marine A/S, Drammensveien 126, N-0277 Olso 2, NORWAY
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Lyngso-Valmet Marine A/S, P.O. Box 130, N-3430 Spikkestad, NORWAY
MMC International, 60 Inip Dr, Inwood NY 11696
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Norcontrol A/S, P.O. Box 1024, N-3191 Horten, NORWAY
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Row Technology, P.O. Box 265, Littlestown, PA17340
Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Dr., Alpharetta, GA 30202
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406

COUPLINGS
Lo-Rez Vibration Control Ltd., 156 West 8th Avenue, Vancouver, BC CANADA, V5Y 1N2

CRANE—HOIST—DERRICK—WHIRLEYS
Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Cross Equipment Inc., P.O. Box 446, Houma, LA 70361
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Hagglunds Inc, Marine Div. Headq., 50 Chestnut Ridge Rd, Montvale, NJ 07645
Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus Hebezeugue GmbH, D-5810 Witten, GERMANY
McElroy Machine & Mfg Co., Inc., P. O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883
Smatco Industries, P.O. Box 4036, Houma, LA 70361
Westmont Inds, 10805 Painter Ave, Santa Fe Springs, CA 90670
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

DECK MACHINERY—Cargo Handling Equipment
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Cross Equipment Inc., P.O. Box 446, Houma, LA 70361
MacGregor-Navire Group, 34 Bedford Rd., Clapham North, London SW4 7HH
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788
McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032
Smatco Industries, P.OBox 4036, Houma, LA 70361
Willem Pot b.v., P. O. Box 29102, 3001 GC Rotterdam, The Netherlands

DECK MACHINERY
Boatlife, 205 Sweet Hollow Road, Old Bethpage, NY 11804
Cross Equipment, Inc., P.O. Box 446, Houma, LA 70361
McElroy Machine & Mfg Co., Inc., P. O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Nordic machine Mfg., 4700 Balard Ave, NW, Seattle, WA 98107
Smatco Industries, P.O. Box 4036, Houma, LA 70361
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108

DIESEL ACCESSORIES
Coltec Industries Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Gearhardt's Inc., P.O. Box 10161, Jefferson, LA 70181
General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105,
Plymouth, MA 02360
Giro-Engineering Ltd., 370 Brook Ln., Sarisbury Hampshire, ENGLAND S036ZA
Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101
Pow-R-Quik, 5518 Mitchelldale, Houston, TX 77092

DIESEL ENGINE—Spare Parts & Repair
Aalborg Ciserv (Miami) Inc., 1539 SW 21st Ave., Ft. Lauderdale, FL 33312
Caltax Marine Diesel B.V., Stationsweg 6a, 4416 ZH Kruiningen ,
THE NETHERLANDS
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610
Coltec Industries, Parts & Service Div., 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Mail Code 60011, Box 3005, Columbus, IN 47202-3005
John Deere, John Deere Rd., Moline, IL 61265
Global Maritime Services, 247 SW 33 Court, Ft. . Lauderdale, FL 33315
Golten Marine Company Inc., 160 Van Brunt St., Brooklyn, NY 11231
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, GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MTU of North America, 10450 Corporate Dr., Houston, TX 77478
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY
National Maintenance & Repair, Foot of Hawthorne, Hartford, IL 62048
New Sulzer Bros., Inc, 200 Park Ave, New York, NY 10166
Pacific Rim Diesel, 3842 W. Marginal Way SW, Seattle, WA 98106
Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW,
ENGLAND;
Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row,
Houston, TX 77084

DIVING & SALVAGE
Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183
Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731
Sea-Side Diving, 28612 Harper Ave., St. Clair Shores, MI 48081

DRILLING & BLASTING
Marine Drilling & Blasting, PO Box 10455, Jacksonville, FL 32247-0455

DRY DOCKS-Design
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Curacao Drydock (USA), PO Box 3012, Curacao, Netherlands Antilles
Ferrostaal AG, D-4300 Essn, Hohenzollernstrasse 24, GERMANY
Marine Design Services, P.O. Box 928, Bonita CA 92002

ELECTRICAL EQUIPMENT
Bender Inc, 400 Gordon Dr, Bldg 501, Exton, PA 19341
L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150
MMC International, 60 Inip Dr, Inwood NY 11696
Row Technology, P.O. Box 265, Littlestown, PA17340
SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116
Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Drive, Alpharetta, GA 30202
Universal Marine Electric Co., Inc., P.O. Box 266-923, Houston, TX 77027-6923

ELECTRONIC DISPLAY
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ELECTRONIC ENCLOSURES
A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

ELECTRONIC INFORMATION SUPPORT
Inventory Locator Service, 3965 Mendenhall Rd. S., Suite 10, Memphis, TN 83115
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ENGINE TEST EQUIPMENT
Amot Controls, PO Box 1312, Richmond, CA 94802
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

EPIRBS
ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale
FL 33310-5247
Alden Electronics, 40 Washington St., Westborough, MA 01581
Litton Special Devices, 750 W. Sprout Road, Springfield, PA 19064

EQUIPMENT-Marine
Byrne, Rice & Turner, Inc., 1172 Camp St., New Orleans, LA 70130
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302

EVAPORATORS
Alfa-Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Aqua-Chem, Water Technologies Div., P.O. Box 421, Milwaukee, WI 53201
Beaird Industries Inc., P.O. Box 31115, Shreveport, LA 71130

FANS-VENTILATORS-BLOWERS
Carling Turbine Blower Co., 8 Nebraska St., P.O. Box 15048, Worcester, MA 01615-0048
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS
Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Robbins Manufacturing, 1200 Airport Rd., Fall River, MA 02722

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, Conveyors & Caster Corp., 3501 Detroit Ave., Cleveland, OH 44113
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98,
Clearbrook, VA 22624
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
Ultra Poly Inc., 2926 South Steele, Tacoma, WA 98409
Viking Fender Co., 50 Church Street, Sea Bright, NJ 07760

FIBERGLASS GRATING
International Grating, Inc, 7625 Parkhurst, Houston, TX 77028

FIBER OPTIC SYSTEMS
AT & T, Cables System/Fiber Optic Div., 111 Madison Ave., Morristown, NJ 07962

FIRE DETECTION SYSTEMS
Autronica Marine A/S, Drammensveien 126, N-0277 Olso 2, NORWAY
Unitor Ships Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

FRICTION COMPONENTS/PARTS
Champion Friction Co. 845 McKinley St., Eugene, OR 97440

FUEL ADDITIVES, CONDITIONING
Hammonds Fuel Additives, PO Box 38114-407, Houston, TX 77238-8114

GALLEY EQUIPMENT
Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062
Forma Kool, 28245 Kehrig St, Mt Clemens, MI 48045
Gaylord Industries, 10900 S W Avery St, P.O. Box 1149, Tualatin, OR 97062

GANGWAYS, LADDERS
Coast Marine & Industrial Supply Inc., 398 Jefferson St., San Francisco, CA 94133
Sea Systems Inc., 65 Avco Road, Ward Hill, MA 01835
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

GENERATORS
Tech Systems, 401 Watertown Rd., Thomaston, CT 06787

GROUND FAULT PROTECTION & LOCATION EQUIPMENT
Bender, inc., 400 Gordon Drive, Bldg. 501, Exton PA 19341

HEAT EXCHANGERS
Alfa-Laval Separation Inc., 955 Mearns Rd., Warminster, PA 18974
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
Tranter Inc, Old Burk Road, Wichita Falls, TX 76307

HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HYDRAULICS
Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Maumee, OH 43537-0631
American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072

INCINERATORS
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
A/S Vesta, P.O. Box 548, DK-9100 Aalborg, DENMARK. U.S. Agent: Aalborg Ciserv
Houston, Inc., P.O. Box 906, Angleton TX 77515

INSULATION
Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729

JET PROPULSION SYSTEMS
North American Marine Jet, P.O. Box 1232, Benton, AR 72015

JOINER—Watertight Door—Paneling—Ceiling System—Decking
GEC-Marconi Electronic Systems Corp., 550 S. Fulton Ave., Mt. Vernon, NJ 10550
IMAC AB, Berga Alle 1, S-252 55 Helsingborg, SWEDEN
U.S. Rep: Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Avenue, Boca
Raton, FL 33431
Marine Accommodations Inc., 8535-3 Baymeadows Rd., Se 140, Jacksonville, FL 32256
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

LIFEBOATS/RAFTS
American United Marine Corp., 5 Broadway, Rt.1, Saugus, MA 01906
Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale,
FL 33310-5247
Archway Marine Lighting, 4501 Swan Ave., St. Louis, MO 63110
The L.C. Doane Co., P.O. Box 975, Essex, CT 06426

Nautilus Equipment Ltd., P.O. Box 66, Station M, Halifax, Nova Scotia B3J2L4, CANADA
Phoenix Products, 6161 N 64th St., Milwaukee WI 53218

LINE BLINDS
American Piping Products, Inc., 22 S. 9th St., New Hyde Park, NY 11040
Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LIQUID CARGO HEATERS
First Thermal Systems, Inc., P.O. Box 4756, Chattanooga, TN 37405

LIQUID OVERFILL PROTECTION SYSTEMS
E.R.L. Marine Products, P.O.Box 1026, New Albany, IN 47151-1026

LOGISTICS
VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564
QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavio, 619 Industrial Rd., Caristadt, NJ 07072
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315
Golten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

MACHINING—On Site Repair
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

MARINE ACCOMMODATIONS
Directions in Design Inc, 633 Emerson, Suite 100, St Louis, MO 63141
Hoperman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Avenue, Boca Raton, FL 33431
Marine Accommodations Inc., 8535-3 Baymeadows Road, Suite 140, Jacksonville, FL 32256
Maritime Services, 3457 Guignard Dr., Hood River, OR 97031

MARINE FURNITURE
Directions In Design, 633 Emerson, Ste. 100, St. Louis MO 63141
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Avenue, Boca Raton, FL 33431
Marine Accommodations Inc., 8535-3 Baymeadows Road, Suite 140, Jacksonville, FL 32256
Maritime Srevces, 3457 Guignard Dr., Hood River, OR 97031
Wilson & Hayes, 1601 Eastlake Avenue, East, Seattle, WA 98102

MARINE SHIP MANAGEMENT
Arkhon Corp., 1810 Chapel Ave. West, Cheny Hill, NJ 08002

METAL PRODUCTS
Jamestown Metal Marine Sales, Inc., 4710 N.W. Second Ave., Boca Raton, FL 33431
Harrington Metal Fabrication, P.O. Box 410, 6720 M 89, Fennville, MI 49408

MOTORS
Tech Systems, 401 Watertown Rd., Thomaston, CT 06787

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
Arctec Offshore Corp., 578 Enterprise St, Escondido, CA 92025
CDI Marine Co., 9487 Regency Square Blvd., Ste. 500, Jacksonville, FL 32225
CT Marine, 18 Church St., Georgetown, CT 06829
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Ln., 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, 3200 Ridgelake Dr., Suite 403, Metairie LA 70002
Design Associates Inc., 14360 Chef Menteurl Highway, New Orleans, LA 70129
Designers & Planners, 2611 Jefferson-Davis Hwy, Ste. 3000, Arlington, VA 22202
Diversified Technologes, 812 Live Oak Dr., Chesapeake VA 23320
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
GHM Inc. (Industrial Measurement Consultants), P.O. Box 1836, Newport News. VA 23601
Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Morris Guralnick Associates, Inc., 130 Sutter St., Ste. 400, San Francisco, CA 94104
C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
JJH Inc., No. 4 Executive Campus, Culbert Blvd. & Route 70, P.O. Box 5031, Cherry Hill, NJ 08034
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
James S. Krogen, 1515 NW 7th St., Ste. 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
David P. Levy Enterprises, 527 Legendre Dr., Slidell, LA 70460
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John V. McCollum, Inc., 1199 Long Point Road, Mt. Pleasant, SC 29464
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Ctr, Ste 3000, N Y, NY 10048
MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090
Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401
Marine Design & Operations, Inc., 226 Chestnut St., Roselle Park, NJ 07204
Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritech, Seacliff, Bay Road, Newmarket, NH 03857
Maritime Design, Inc., 3020 Hartley Rd., Jacksonville, FL 32257
R J. Mellusi & Co., 71 Hudson St, New York, NY 10013
Nautical Designs, Inc 2101 S. Andrews Ave, Suite 202, Ft Lauderdale FL 33316
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ogden Government Services, 3211 Jermantown Rd., Fairfax, VA 22030
Olsen Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777
Omega Marine Engineering Systems, Inc., 11757 Katy Freeway, Ste 1100, Houston TX 77079
QED Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Fulsom St., Ste. 301, San Francisco, CA 94107
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 965, Essex, CT 06426; 17 Battery PL, New York, NY 10004; P.O. Box 975, Barnegat Light, NJ 08006; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041; 1305 Franklin St., Suite 210, Oakland, CA 94612.
George G. Sharp, Inc., 100 Church St., New York, NY 10007
R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
TIMSCO, P. O. Box 91360, Mobile AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT
Anschutz & Company, One Madison St., East Rutherford, NJ 07073
AT&T, High Seas Dept., 412 Kemble Ave., Room C380, Morristown, NJ 07960
Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
Cellnet Corp, 400 Main St, Stamford, CT 06901-3004
Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024
C. Plath, 222 Severn Ave., Annapolis, MD 21403
EDO Corporation, 2645 S 300 West, Salt Lake City. UT 84115
Electronic Marine Systems, 800 Ferndale PL., Rahway, NJ 07065
Fairtide Enterprises, Inc., 2536 Sonata Dr., Columbus, OH 43209
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Hose McCann, 9 Smith St., Englewood, NJ 07631
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IDB Aero-Nautical Communications, 15245 Shady Grove Rd, Rockville, MD 20850
Kenwood USA Corp., Marine Prod. Div., 2201 E. Dominquez St., Long Beach, CA 90810
Mackay Communications, 441 US Highway #1, P.O. Box 331, Elizabeth NJ 07207
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Megapulse, Inc., 8 Preston Court, Bedford MA 01730-2380
Nautronix, 15401 Vantage Pkwy W., Houston, TX 77032
Naval Electronics, 5417 Jetview Circle, Tampa FL 33634
Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY
Novatech, 820 Cormorant St, Victoria, BC V8W 1R1, CANADA
Raytheon Marine Co, 46 River Road, Hudson, NH 03051
Robertson Marine Systems, 3000 Kingman Street, Suite, 207, Metairie, LA 70006
SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116
Scandinavian Micro Systems P.O. Box 155, N-1411, Kolboton, NORWAY
Simrad, 1921033rd Avenue West, Lynwood, WA 98036
Speny Marine Inc., 1070 Seminole Trail, Charlottesville VA 22901
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Summer Equipment Ltd., 24 West 4th Ave., Vancouver V5Y 1G3, CANADA
Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130

NOZZLES
Harrington Metal Fabrication, P. O. Box 410, 6720 M 89, Fennville, MI 49408

OIL—Marine—Additives
Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001
Shell Oil, P.O. Box 2463, Houston, TX 77252
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS
ACS Industries, Inc., 14208 Industry Rd., Houston, TX 77053
Alfa-Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974-0556
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale NJ 07647
Fast Systems, 3240 North Broadway, St. Lous, MO 63147
MMC International, 60 Inip Dr, Inwood NY 11696
National Fluid Separators, 827 Hanley Industrial Ct. St Louis, MO 63144
Nelson Industries, Highway 51 West. Stoughton, WI 53589

PAINT—COATING—CORROSION CONTROL
Amclean Coating Removal, 12920 S.W. 99N. Ave., Miami, FL 33176
Ameron, 201 N. Berry St., Brea, CA 92622
The Amessen Corp., Corrosion Dynamics Div., 1100 Walmut St., Rosell, NJ 07203
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502
Global Tech, 9801 Westheimer St., Ste. 202, Houston, TX 77042
Jamestown Distrib., 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Hempel Coatings, Foot of Curie Avenue, Wallington, NJ 07057
Melvin Pierce Marine Coating, Inc., P.O. Box 93, Semmes, AL 36575
Microphor, Inc., Marine Div., 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490
Sigma Coatings, 8979 Market St., Houston, TX 77029, 330 Rover Rd., Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030

PIPE FITTINGS/CONNECTING SYSTEMS
Aeroquip Corp., 1695 Indian Wood Cir., Maumee, OH 43537-0631
Deutsch Metal Components. 14800 S. Figueroa Gardena CA 90248
Lokring, 396 Hatch Drive, Foster City, CA 94404
Stanley G. Flagg Co., 1020 W. High St., Stowe, PA 19464

PORT SERVICES
Port of Portland, 5555 N. Channel Ave., Portland, OR 97217

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Avondale Industries, Harvey Quick Repair, P.O. Box 116, Harvey, LA 70058
American Air Filter, P.O. Box 35690, Louisville, KY 40432
ASEA Brown Boveri, 1460 Livingston Avenue, N. Brunswick, NJ 08902
ASEA Brown Boveri (Stromberg), P.O. Box 185, 00381 Helsinki, FINLAND
Argo International, 140 Franklin St., New York, NY 10013
Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND
Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081
CWF Hamilton & Co., Ltd., P.O. Box 709, Christchurch, NEW ZEALAND
Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320
Coltec Industries (Fairbanks Morse Engine Div.), 701 Lawton Ave, Beloit, WI 53511
Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005
Electro-Motive, div. General Motors, 9301 W 55th St, La Grange, IL 60525
Fincantieri, Diesel Engines Div—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
Fundiciones RICE, AV Rios Espinoza No.88, COL BENITO JUAREZ, Mazatlan, Sinaloa, Mexico
GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp MaK, 7555 Danbro Crescent, Mississauga, Ontario, CANADA L5N 6P9
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
Markisches Werk, P.O. Box 1442, D-5884 Halver GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Holeby, 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
MKW Power Systems, 301 S. Church St., Rocky Mount, NC 27801
Mitsubishi Heavy Industries America, Inc., 630 Fifth Ave., Ste. 3450, NY, NY 10011
New Sulzer Diesel, Ltd., CH-8401, Winterthur, SWITZERLAND
Nylands Marine Service A/S, P.O. Box 130, N-4818 Faervik, NORWAY
Omnithruster Inc., 9515 Sorensen Ave., P.O. Box 2144, Santa Fe Springs, CA 90670
Ovako Steel Couplings AB Sweden, S-813 00 Hofors SWEDEN
Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND
Rolla SP Propellers USA, 4030 Mustang Road, Melbourne, FL 32934, USA
Kari Senner Inc., 25 W Third, Kenner LA 70062
Schottel-Werft, D-5401 Spay, GERMANY
Siemens Energy & Automation, Inc., Systems Div., Marine Systems no. America (A23N), 100 Technology Dr., Alpharetta, GA 30202
Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey LA 70059-0008
Textron Lycoming, 550 Main St., Stratford, CT 06497
Thrustmaster of Texas, 12227-KFM 529, Houston, TX 77041
J. M. Voith GmbH, Marine Division, Postfach 1940, D-7920, Heidenheim/Brenz, GERMANY U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Oy Wartsila Ab, Vasa and Abo Divisions, P.O. Box 244, SF65100 Vasa, FINLAND
WesTech Gear Corp., 2600 E. Imperial Highway, Lynwood, CA 90262
Westinghouse Marine Div., 401 E Hendy Ave, Sunnyvale, CA 94088
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

PUMP—Repair—Drives
Beckson Marine, 165 Holland Ave, Bridgeport, CT 06605
Coffin Turbo Pump, Inc., 326 S. Dean Street, Englewood, NJ 07631
Del Gavio, 619 Industrial Rd., Carldstadt, NJ 07072
Dresser Pump 401 Worthington Ave., Harrison, NJ 07029
Golten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101
Leistritz Corporation, 165 Chestnut Street, Allendale, NJ 07401
Vita Motivator, 99 W Hawthorne Ave., Suite 622, Valley Stream NY 11580

REFRIGERATION EQUIPMENT/SERVICES
Unitor Ships Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

REMOTE VALVE OPERATORS
American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906
S. S. White Technologies, Inc., 151 Old New Brusnwick Rd., Piscataway, NJ 08854
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
American Manufacturing Co., 200 S. Park Rd, P.O. Box 52125, Lafayette, LA 70505
Dupont, Montgomery 403, 1011 Centre Road, Wilmington, DE 19805
United Ropeworks (USA), Inc., 151 Commerce Dr., Montgomeryville, PA 18936

SANITATION DEVICE—Pollution Control
Jered Brown Brothers, 56 South Squirrel Rd., Auburn Hills, MI 48326
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
Microphor, Inc., 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490
Red Fox Environmental Services, Inc., P.O. Box 53809, Lafayette, LA 70505-3809
Research Products/Blankenship (Incinolet), 2639 Andjon, Dallas, TX 75220

SCALE MODELS
Sturgeon Bay Model Shop, 187 N Ninth Ave., Sturgeon Bay WI 54235

SCUTTLES MANHOLES
L.S. Baer & Assoc., 7527 NE 33rd Dr., Portland OR 97211

SHIPBUILDING EQUIPMENT
NEI Syncrolift, Inc., 8970 S W 87th Ct., Miami FL 33176

SHIPBUILDING—Repairs, Maintenance, Drydocking
Astilleros Espanoles S.A., Padilla 17, 28006 Madrid, SPAIN
Atlantic Marine, Inc., P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., 8500 Heckscher Dr., Jacksonville, FL 32226
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150
Bender Shipbuilding & Repair, P.O. Box 42, Mobile AL 36601
Bender Inc., 400 Gordon Drive, Bldg. 501, Exton, PA 19341
Bath Ship, Sparrows Point Yard, Sparrows Pont MD 21219
Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178
Boillnger Lockport & Larose, P.O. Box 250, Lockport, LA 70374-0250
Bourg Drydock, P O Box 1852, Houma, LA 70361
Chris-Marine AB, P.O. Box 9025, S-200 39, Malmo, SWEDEN
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Curacao Drydock Inc., P O. Box 3012, Curacao, Netherlands Antilles
Eastern, 505 North Sam Houston Pkwy. East, Ste. 150A, Houston, TX 77060
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Galveston Shipbuilding, 6800 Port Industrial Boulevard, P.O. Box 2660, Galveston, TX 77553
Gulf Craft, Inc., 3904 Highway 182, Patterson, LA 70392
Halter International, 7412 Lakeshore Drive, New Orleans, LA 70124
Hitachi Zosen, Hitachi Shipbuilding & Engineering Co., 1-1-1 Hitotsubashi, Chiyoda-ku Tokyo 100, JAPAN
Institute for International Research, 437 Madison Ave., N.Y., N.Y. 10022
Jacksonville, Shipyards, 750 E. Bay St., Jacksonville, FL 32202
Jeffboat, Inc., P.O. Box 610, Jeffersonville IN 47130
Kvichak Marine, 615 N 34th St, Seattle, WA 98103
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
MIL Davie, Inc., P.O. Box 130, Levis, Quebec, CANADA
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
Munson Manufacturing, 150 Dayton, Edmonds WA 98020
National Maintenance & Repair Inc., P.O. Box 38, Hartford, IL 62048
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders, 5400 South Cameron Rd., Freeland, WA 98249
Norconsult Engineering Co., Inc., P.O. Box 529, 5785 Plantation Rd., Theodore, AL 36582
Protecno, Ltd, Rua Eugenio Castro, 13A-r/c, 2800 Almada, PORTUGAL U.S. Rep: Walter Thorsen, Inc., 79 Owens Rd., P.O. Box 755, Mahwah, NJ 07430 0755
Thomas Marine, 37 Bransford Street, Patbhogue, NY 11772
SeaArk, P.O. Box 210, Monticello AR 71655
SeaFab, P.O. Box 1651, 4111 Cedar St. Pascagoula, MS 39567
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381
Skipperliner Shipyards, 621 Park Plaza Dr, Dept 21, LaCrosse WI 54601
Southwest Marine, Foot of Sampson St, San Diego, CA 92113-0308
Steiner Shipyard, Inc., P.O. Box 742, Bayou la Batre, AL 36509
Swath Ocean, 979 G Street, Chula Vista, CA 92011
Textron Marine Systems, 6600 Plaza Drive, New Orieans, LA 70127-2584
Trinity Marine Group, Box 3029, Gulfport, MS 39505-3029
Viking Maritec, 300 Montour Pl., Ste 211, Oakdale, PA 15071
Willard Marine, inc., 1250 N. Grove St., Anaheim, CA 92806
Zidell Marine Corp., 3121 S.W. Moody Street, Portland, OR 97201
Zodiac of North America Inc., Thompson Creek Rd., P.O. Box 400, Stevensville, MD 21666

SHIPYARDS
Balehi Marine Inc., P.O. Box 600, Lacombe, LA 70445

SIMULATOR TRAINING
Houston Marine Training Services, 1600 20th Street, Kenner, LA 70062
Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371

SILENCERS
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

STABILIZERS
Naiad Stabilizers, Van Dusen & Meyer Inc., P.O. Box 558, Shelton, CT 06484

STUFFING BOXES
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

SURVIVAL EQUIPMENT
Parkway/Imperial, 241 Raritan Street, South Amboy, NJ 08879
Schat Watercraft, P.O. Box 7008, Newark, DE 19714
Viking Life Saving Equipment, 1625 N Miami Ave., Miami FL 33136

TANK CLEANING EQUIPMENT
Polarmarine, Alvsborgsgatan 37, 72 Gotbenburg, SWEDEN S-414 72

TANK LEVELING INDICATORS
American United Marine Corp., 5 broadway, Rt. 1, Saugus, MA 01906
Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
ERL Marine Products div, PO Box 1026, New Albany, IN 47151-1026
Ian-Conrad Bergan, 3409 Gulf Breeze Parkway, Gulf Breeze, FL 32561
IMO Industries, Gems Sensors Division, One Cowles Rd, Plainville CT 06062
Metritape, PO Box 2366, Littleton, MA 01460-2366
Midland Mfg. Corp, PO Box 226, Skokie. IL 60076-0226
MMC International, 60 Inip Dr, Inwood NY 11696
Saab Marine Electronics AB, P.O. Box 13045, S-402 51 Goteborg SWEDEN

TESTING SERVICES
Wyle Laboratories, 7800 Govern's Dr. S.W., Huntsville, AL 35807

TOOLS
Ingersoll-Rand, Prof. Tool Group, Allen & Martinsville Rd., Liberty Corner 07938
San Diego Marine Hardware, 1660 Logan Avenue, San Diego, CA 92113

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Vibranalysis Engineering Corp., 9300 Gamebird, Houston, TX 77034
TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Balehi Marine Inc., P.O. Box 600, Lacombe, LA 70445
Jack Faulkner, 2419 Caddy Lane, Flossmoor IL 60422
TURBOCHARGERS
ASEA Brown Boveri, 1460 Livingston Ave., North Brunswick NJ 08902
VACUUM TOILET SYSTEM
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Hall-Toledo, Inc., 525 West Sophia, Maumee, OH 43537
Hydra-Search Co Inc, 120 Admiral Cochrane Dr, Annapolis, MD 21401-7399
Leslie Controls, 1250 Telecom Dr., Tampa, FL 33637
Loeffler Machine, US #1 & Robbins Ave., Penndel PA 19047
MMC International, 60 Inip Dr, Inwood NY 11696
Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474
Stanley G. Flagg Co., 1020 West High St., Stowe, PA 19464
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201
VAPOR RECOVERY CONTROLS
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Row Technology, Inc., P.O. Box 265, Littlestown PA 17340
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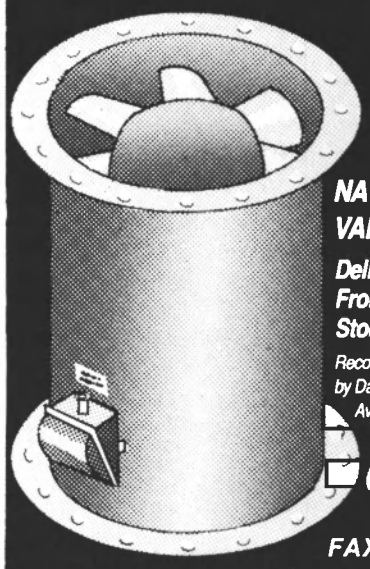

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Primary responsibilities include design integration of main propulsion and auxiliary machinery systems for new construction and alteration of Coast Guard Cutters and Ice Breakers. Work is challenging and varied.
Experience in contract and detail design of shipboard machinery systems for Commercial and Naval ships is essential. Job is located in Washington, D.C. Submit a current SF-171 to Commandant (G-PC-5) Room 3418 USCG HQ, 2100 Second St., S.W., Washington, D.C. 20593-0001, Attn: Ms. Shirley Rochon, (202) 267-2331.

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Application Procedures: Please submit an application/resume referencing Job# 101472
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CONTACT: Send resume to :

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Filing Deadline: 5 October 1992

Application Procedures: Please submit an application/resume referencing Job# 101471

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CONTACT: Send resume to:

Sally Petze
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PRMMI Names Vazquez VP Of Operations In Puerto Rico

Andres Calvo, senior vice-president and general manager of Puerto Rico Marine Management, Inc., (PRMMI), agent for Navieras de Puerto Rico, announced the appointment of **Waldo G. Vazquez** to vice president of operations, Puerto Rico.

In his 34-year career in the maritime transportation industry, Mr. **Vazquez** has been an asset to several major corporations beginning with Pan Atlantic Steamship Corporation which he joined in 1958. Pan Atlantic became Sea-Land Service Corporation in 1960 and he remained with them as terminals manager until 1967.

From 1968 to 1972, Mr. **Vazquez** served as president and part owner of United Terminals of Puerto Rico, Inc., before becoming executive director of Maritime Service Corporation and assistant to the president of Puerto Rico Ocean Service Association in 1972.

Joining PRMMI in 1976 as director of stevedoring, Mr. **Vazquez** became the company's general operations manager of foreign services before his recent promotion.

Unitor Offers UMACS As Ship Corrosion Solution

In response to pressure from classification societies, more stringent environmental legislation and higher safety demands from charterers and insurers, Unitor AS, Kolbotn, Norway, has developed Unitor Marine Anti-Corrosion Services (UMACS), a systematic approach to the problem of corrosion.

The service begins with an initial survey of the corrosion problem and a proposal for developing solutions tailored to meet the requirements for long term corrosion protection, followed by a presentation to the customer.

UMACS offers extensive technical expertise, project planning, management and supervision, application, cleaning, surface preparation and application equipment, inspection, training, anti-corrosion products and periodic monitoring and condition reporting as part of an after sales service. Particular emphasis is placed on close supervision, quality control and safety during all stages. Any of these services can be provided separately, in combination or all together as a turnkey project.

Unitor will initially offer UMACS from four ports: Rotterdam, Dubai, Houston and Singapore. The service will gradually be expanded to other locations.

For additional information about Unitor's UMACS solution to corrosion,

Circle 36 on Reader Service Card

Bug-O Systems Offers Brochure On New Compact Drive-Pipe

Bug-O Systems, Pittsburgh, Pa., has announced the availability of its Compact Drive-Pipe system for automated cutting and welding applications. A four-page brochure entitled "Compact Drive-Pipe: Affordable Automation for Welding, Cutting and Semi-Automatic Processes," provides details on the system.

The Bug-O System CDS-1000 is a compact drive and carriage that is designed to run on stainless steel ring rails. It is available in three speed ranges and when used with the Compact Rack System will carry cutting torches or welding guns around pipe or tubing. The CDS-1000 has a built-in quick release for easy mounting and removal at any point on the rail.

The company's brochure utilizes line drawings and illustrations to provide the customer with the features, dimensions and technical data for the CDS-1000 system and its associated ring rails and Compact Rack System.

The last page of the Bug-O Systems brochure provides drawings of the various supports and accessories available for the CDS-1000 system.

To receive a free copy of the Bug-O Systems brochure,

Circle 40 on Reader Service Card

NY/NJ Port Authority Awards Contract To Vickerman, Zachary, Miller

The Port Authority of New York and New Jersey recently awarded a contract to Vickerman, Zachary, Miller of Oakland, Calif., to plan and design an expanded, on-dock ExpressRail Intermodal Transfer Facility at the Elizabeth-Port Authority Marine Terminal.

When completed at the end of 1993, the permanent facility will double the interim terminal capacity by handling more than 100,000 containers annually.

The present interim on-dock facility opened in August 1991, shortly after Conrail began doublestack rail service to the Midwest from Port Newark/Elizabeth.

A permanent transfer facility is part of the Port Authority's long-range program to improve rail service for oceanborne cargo. Under its Container Incentive Program, the port pays $20 on import containers and $40 on export containers moving by rail that originated in or are destined for locations more than 260 miles from the port.

For additional information on the services available from Vickerman, Zachary, Miller,

Circle 43 on Reader Service Card

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- ❑ **DIESEL REPAIR & PARTS DIRECTORY**
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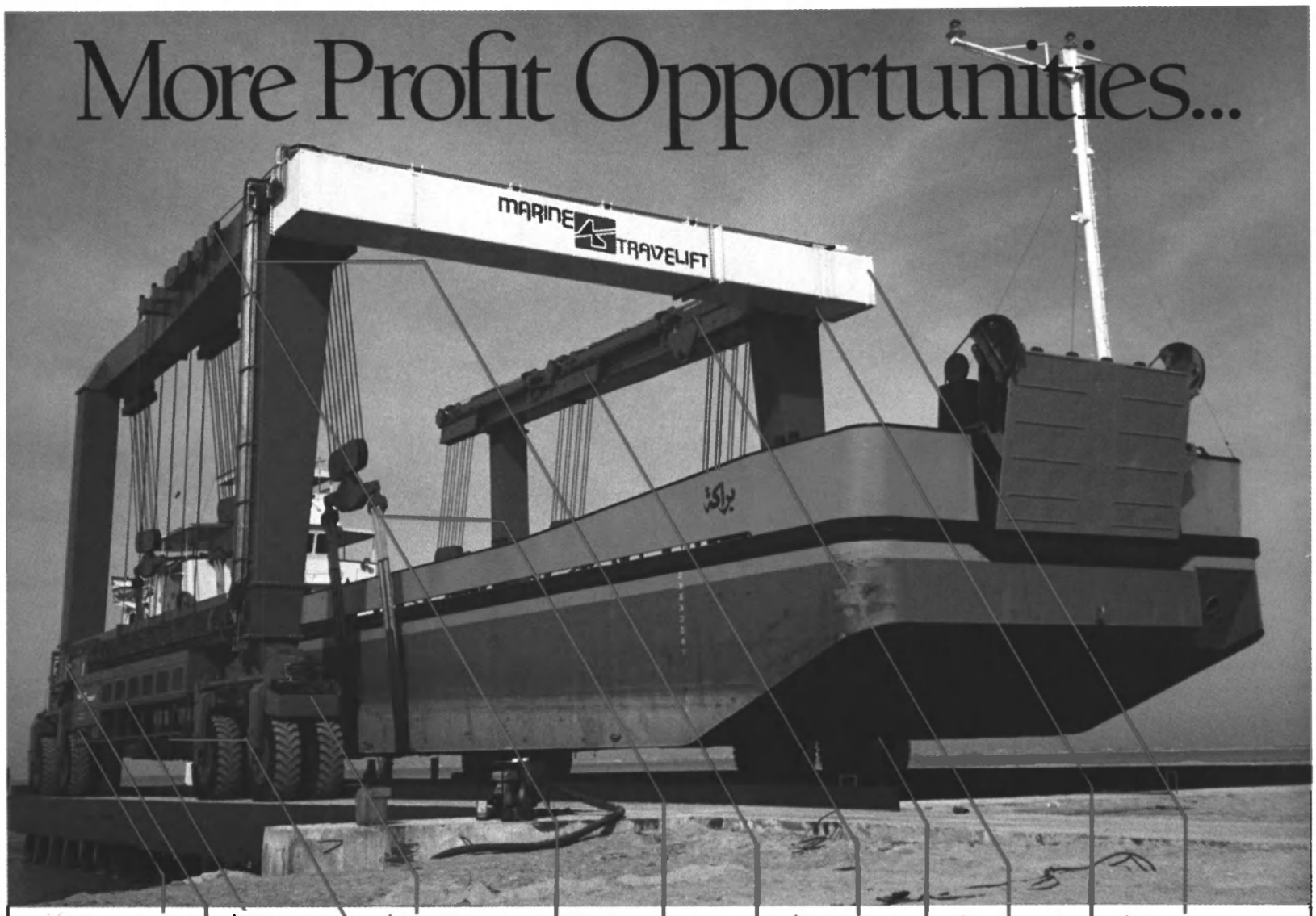

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