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ANNUAL AWARDS ISSUE

Great Ships
of 1995

 **HDW** 

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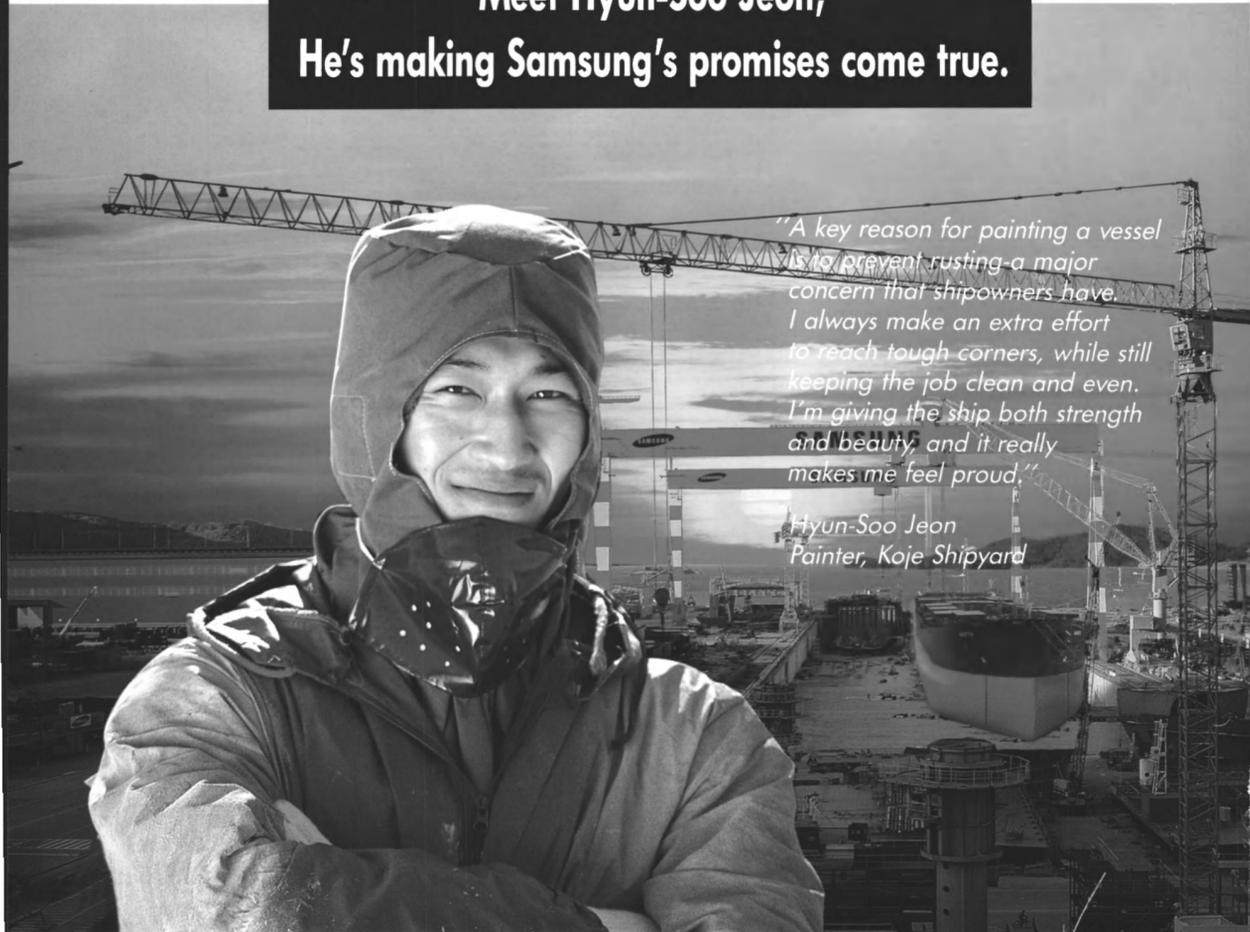
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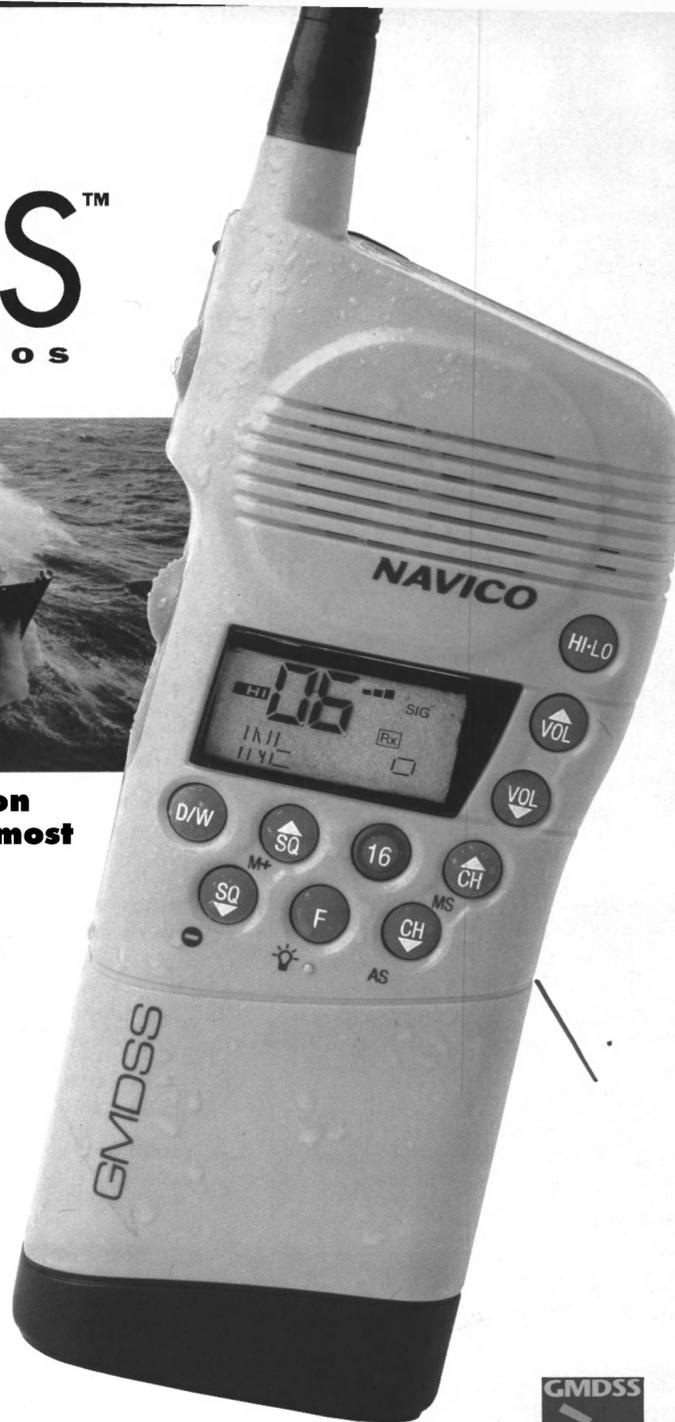
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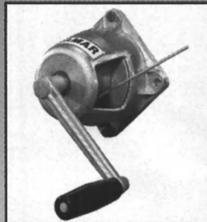
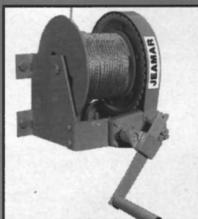
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ON THE COVER

The *API China*, sister to the *API Japan* — which is one of this year's Great Ships — during its outfitting at Howaldtswerke Deutsche Werft (HDW). The Great Ships feature begins on page 29. The contributions of German yards, including HDW, are the focus of an article beginning on page 22.

29 GREAT SHIPS OF 1995:

This year's crop of newbuilds left no small number of candidates for the title of Great Ship. In this year's feature, a diverse selection of yards have put forward their technological best.



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In discussing the Maritime Administration's dredging policy, Ms. Yim attempts to unravel a convoluted issue with heavy implications for both commerce and the environment.



25 OIL SPILL RESPONSE:

NRDA (Natural Resource Damage Assessment) procedures and the benefits of oil spill response preparation for owning companies are spotlighted.



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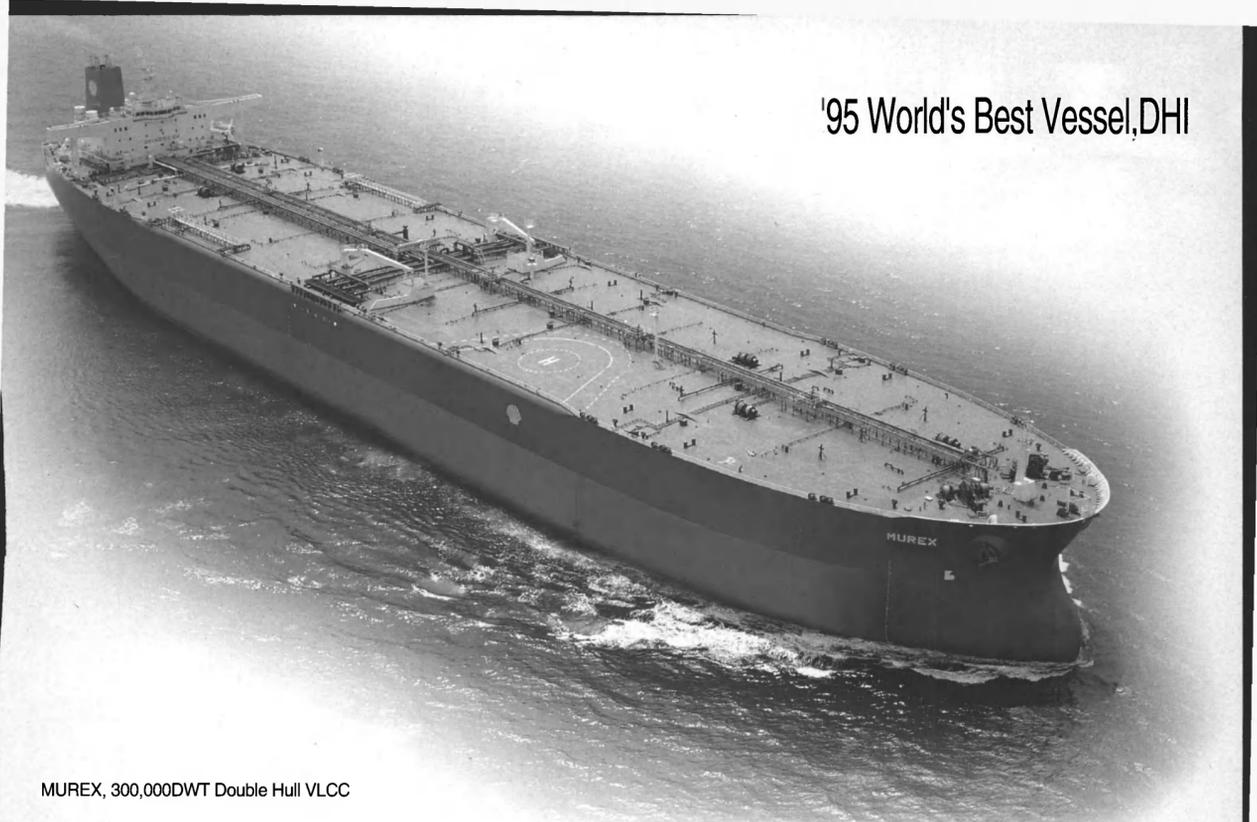
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EDITOR'S NOTE

EuroPort, held last month in Amsterdam, provided many positive signs that the industry's health is good. After discounting the expected positive news from the innocuous "show buzz," it was evident that many different segments of the industry are genuinely excited for the near and long term. This is no blind assumption that everyone who buys, sells and supplies service in the industry has a rosy outlook. The maritime industry continues its journey through an eventful period of consolidations of power, following the path of the oft-repeated, but very true saying that "only the strong survive."

With that said, the December issue of Maritime Reporter is dedicated to the efforts of all who design, supply, build and own ships. The "Great Ships" feature, which starts on page 29, profiles 12 of the finest vessels delivered in 1995, from the largest-ever-purpose-built cable ship, to a VLCC which is structurally designed to far exceed international regulations in terms of safety and fatigue strength. This group of ships is particularly



strong, if based only on the fact that they were chosen from a record number of applicants submitted from yards around the world.

The German Shipbuilding Review (starting on page 22) provides a snapshot of a country whose yards are faced with a common industry challenge: enhancing efficiency to record levels to ensure prosperity in the next century. The German Review is particularly timely considering two recent events: the U.S. was selected as the official partner country for SMM '96, the Hamburg Show; and a delegation of U.S. suppliers — in conjunction with the U.S. Maritime Administration — recently visited select German shipyards to gauge the prospects for future business.

Finally, an update on oil spill response — a topic near and dear to every tank vessel owner/operator — is tackled in a series of articles filed by the MR staff, starting on page 25.

Gregory R. Trauthwein

Greg Trauthwein, editor

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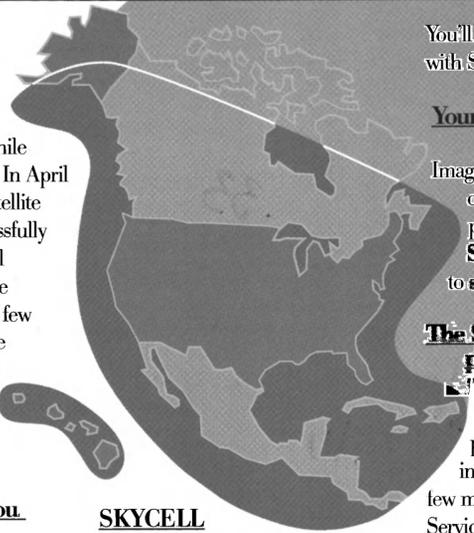
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He succeeds **Okkie Gronow** of Donjon Marine, South Africa, who held the office for the past two years.

In addition to this executive appointment, **Alan**

Bond has been elected vice president of ISU.

Mr. **Bond** is general manager of Semco Salvage & Marine Pte. Ltd., Singapore, which provides salvage services east of Suez.

For more information on ISU
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Arnold Witte

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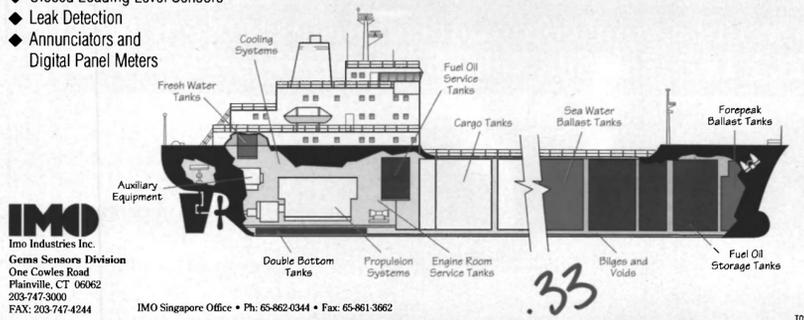
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Maritime Reporter/Engineering News

Enacting A National Dredging Policy: A Call To Action

by Joan B. Yim, Deputy Maritime Administrator

Dredging of U.S. navigation channels and berths is fundamental to successful commerce. As ports and harbors fill with sediment, barriers to smooth ship access mount. This increases the probability of difficult passage, groundings, or required lightering.

These problems can be alleviated by advanced planning and a predictable process for determining how, when, and where to dredge. This is self-evident, but tangential issues can cause a seemingly straightforward path to become a convoluted maze.

There are risks in delayed action. The Oil Pollution Act of 1990 is frequently cited for its insurance and double-hull requirements, but its overall purpose of preventing damage to the environment from accidents and oil spills is sometimes lost. Such environmental damages could result should the lack of clear navigation channels and berths put vessels at risk.



Joan B. Yim

Instead of focusing on minimizing risks, by spending consumer dollars setting up fuel lightering schemes, spill response and readiness plans, and natural resource damage assessment policies, it is more logical to emphasize prevention. Even after a spill occurs, natural resources damage assessments can affect the impact of a spill in terms of lost value to the public. Does it not then seem worthwhile to focus on prevention?

This is a fundamental thesis of the Clinton Administration's National Dredging Policy and its action plan for improving government's responsibilities in this regard. The policy is based on four short statements of principle:

- The regulatory process must be timely, efficient and predictable;
- Advanced dredged material management must be conducted on a regional basis by a partnership of federal, state and local governments, natural resource agencies, public interest groups, the maritime industry and private citizens;
- Dredged material managers must become more involved in watershed planning in recog-

inition of the contribution of upstream sources of pollution to harbor sediment contamination; and

Dredged material should be viewed as a resource, which can contribute to wetland creation, beach nourishment and other development projects.

The recognition of sources of pollution and their control and cleanup may be obvious to some, but it is critical to have these factors identified in a national policy. Now it is up to the federal agencies charged with implementing the National Dredging Policy to assure that economic and environmental issues receive balanced consideration. The U.S. Environmental Protection Agency, the Corps of Engineers, the National Marine Fisheries Service, the Office of Oceans and Coastal Resources Management, the Fish and Wildlife Service, and the Maritime Administration have formed a National Dredging team and are in the process of setting up regional teams.

It is critical for the maritime industry to let local and regional agencies know how important timely dredging is to their local and region-

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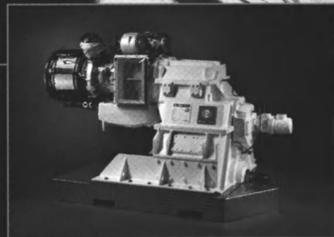
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EDITORIAL: JOAN B. YIM

Enacting a National Dredging Policy: A Call To Action

al economies. The connection between safe and efficient maritime traffic and the daily needs of community life has to be made.

When beginning its work with other federal agencies on developing the National Dredging Policy, the Maritime Administration was

faced with the same challenge. Officials met this challenge by holding more than 20 outreach meetings, visiting ports and harbors throughout the country. As maritime, environmental and community members spoke to agency representatives, understanding of

port functioning and safe ship piloting was fostered.

Elected officials — mayors, governors, city council members and state legislators — all can affect policies governing dredging of ports and harbors. The need to balance economic development and

environmental protection undoubtedly will be of major concern to them. These groups need to be educated on today's intermodal transportation system and the critical role ports play in that system.

Globalization of our nation's economy is irreversible. All signs point to significant increases (at least five percent annually until the year 2000) in imports and exports to and from U.S. markets. Increasingly, production of goods will be multi-national, with components manufactured in several nations under least-cost conditions and assembled in locations close to major markets. At the same time, distribution will increase worldwide with the growth of markets in developing countries. Efficient intermodal transportation will be central to the capability of businesses to survive in the global economic community.

"Point-to-Point" logistical planning and "Just-in-Time" delivery systems require an efficient transportation infrastructure system to succeed. While the need for adequate highway and rail access to ports is readily understood, dredging and waterside access is equally important. This is why the Administration's dredging action plan calls for revisions to the Intermodal Surface Transportation Efficiency Act to ensure that the planning process outlined in this legislation provides for linkages with plans which address dredging issues.

In addition to national and local policy support for "open" navigation channels, investment must be made on developing technologies to determine where and how to dredge as well as for disposal methods. Computer tools and modern marine engineering technologies can determine where sediment is accumulating relative to vessel traffic, thus reducing the volume of material to be moved. Ship simulators assist in channel design and real-time reporting of water level measurements to maximize use of existing channel depths. This also can reduce dredging needs. In addition, decontamination technologies for contaminated sediment are being reviewed. Larger scale experiments will show how cost-effective these methods and technologies can be in addressing problems, primarily in highly urbanized port areas.

Prevention, planning, and technological applications can support the business goals of regular dredging, assuring safe navigation. However, the Administration's efforts are only a beginning. It is now incumbent upon the entire maritime industry to focus the awareness of every community on the relationship between timely and adequate dredging and economic well being.



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Trent Lott And James Barker Honored As Admirals Of The Ocean Sea

by Bridget A. Murphy, assistant editor

On Friday, November 3, the United Seamen's Service presented its annual Admiral of the Ocean Sea (AOTOS) Awards Dinner at the Sheraton New York Hotel and Towers in New York City. The recipients of this year's awards were Senator Trent Lott (R-Miss.), Senate Majority Whip and chairman of the Surface Transportation and Merchant Marine Subcommittee, and James Barker, an industry leader involved in liner, bulk and Great Lakes shipping, and the towing and transportation industry.

At a press conference previous to the ceremony, Senator Lott spoke with *MR/EN*. "I am determined it will be in a Republican Congress that we finally get some things done for the maritime industry." He said that his interest in the industry is a reflection of the involvement of the people of Mississippi in the maritime sector, and added that his father worked as a pipefitter at Ingalls Shipbuilding in Pascagoula, Miss.

Senator Lott expressed displeasure with the OECD accord, saying that 10 years is too long of a phasing-in period, and that under the terms of the agreement, France would get special treatment. His solution? "Either make them stop subsidizing, or subsidize our yards." The senator also discussed Title XI financing, saying that in his opinion, the loan financing program would continue to be funded in Congress.

The Republican legislator also offered an overall prescription for a healthy, commercial U.S. shipbuilding industry. "The industry as a whole has got to get together. It's not 1955, it's 1995. America needs to have some sort of loan program available. The U.S. should also get a lot more aggressive in the way we handle OECD."

Later in the evening, Helen Delich Bentley, former U.S. Representative from Maryland and 1972 AOTOS awardee, presented the awards — silver statues of the first admiral of the sea, Christopher Columbus — to both recipients. Mr. Barker, principal owner of Interlake Steamship Company, Moran Transportation Company and Mormac Marine Group, was the first to accept an award.

"This is an award for the Great Lakes," said Mr. Barker, "(an area) which has never really been recognized." The Great Lakes shipping magnate then launched into a passionate defense of the Jones Act. He advised all 700 maritime executives in attendance to "stop whining and get out and tell others what it's all about, because it's an act that can stand on its own."

He also made suggestions for

bolstering the U.S. maritime industry as a whole. "Productivity is the key," continued Mr. Barker. "We must find ways to build ships (that require) fewer crew members." He added that the answer is to "embrace technology to gain leadership, in order to be the

safest, lowest cost form of transportation. The shipping executive expressed the need for a comprehensive merchant marine program, "something to put people to work out on the ocean."

Next in the program, Senator Lott accepted his award gracefully,

rousing the audience with his words. "The time for talk is gone. The time for action is now. Maritime reform has been too long in coming. Twenty years is too long." He continued, "Private sec-

(Continued on following page)

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Circle 225 on Reader Service Card

NYSCC Honors Congresswoman Susan Molinari



Rep. Susan Molinari (R.N.Y.) accepts an award from the N.Y. Shipping Cooperation Committee, presented by the organization's president, Emmanuel Couloucoudis.

On October 28, the New York Shipping Cooperation Committee (NYSCC) hosted its first annual dinner cruise around Manhattan aboard World Yacht's *Princess*, in a celebration of the Greek community's contributions to the American maritime industry.

Congresswoman Susan Molinari (R-N.Y.), a member of the Transportation and Infrastructure Committee and the Subcommittee on Coast Guard and Maritime Transportation, was the honored guest at the event.

Other dignitaries in attendance included: Loucas Tsilas, Ambassador of Greece to the U.S.; Virginia Tsouderou, former deputy foreign minister of Greece; Andreas Jacovides, Ambassador of Cyprus to the U.S.; and Costas Cominos, president, Hellenic Chamber of Shipping.

During the gala event — which coincided with the 55th anniversary of Greece's refusal to surrender to Axis powers — the *Princess* cruised by destroyer escort T.S. *Aetos*/USS *Slater*, located at the Intrepid Sea-Air-Space Museum, and a ceremonial blessing of the vessel took place in order

to salute Greek forces that contributed to the World War II Allied victory. Plans are currently underway for the founding of a maritime museum aboard the destroyer escort vessel.

Later in the evening, Rep. Molinari accepted her award, stating, "While maintaining the bonds of mother country, Greeks have seized the American way."

I am excited (that) the New York Shipping Cooperation Committee is providing a service to the maritime industry." She continued by emphasizing the importance of minority contributions to the development of America. In an interview with *MR/EN*, Rep. Molinari also recognized the contributions of women in the maritime industry, in honor of "Women In Shipping" month. "Females are making impressive strides in the maritime industry," she said, adding, "it is never easy to break through the glass ceiling."

The NYSCC was founded in 1993 as a trade group devoted to the promotion of Greek maritime interests and the exchange of information among the shipping community in New York and elsewhere in the Western Hemisphere.



Marinette Names Cassidy Executive VP

Marinette Marine Corp., Marinette, Wis., has announced that David Cassidy has been appointed executive vice president of the company, effective immediately. In his new position, Mr. Cassidy will be responsible for all engineering and manufacturing operations of the shipbuilding company. Previously, he held the position of president and CEO at Marystown Shipyard in Newfoundland, and was also previously employed as

executive vice president of Halifax Dartmouth Industries in Nova Scotia.

For more information
Circle 132 on Reader Service Card

SMI To Build \$36-M Casino Riverboat For Argosy

Service Marine Industries (SMI), Morgan City, La., has contracted to construct what will reportedly be the largest casino riverboat newbuilding in the U.S.,

a \$36 million project, which will result in a 408-ft. (124.3-m) side-wheel style vessel for Argosy Gaming Co. affiliate Indiana Gaming Company, LP. The vessel will provide 75,000 sq. ft. of gaming space, is scheduled to be delivered in the spring of 1997, and is intended for operation in Lawrenceburg, Ind.

SMI anticipates that construction on the vessel will begin in early 1996.

For more information on
Service Marine Industries
Circle 133 on Reader Service Card

Loven Appointed ITW Adhesives Manager

William E. Lovén has been appointed business manager, Industrial Adhesives, for ITW Adhesives, Danvers, Mass. Mr. Lovén has more than 17 years of experience in the marketing and sales of medium- and high-performance adhesives, and will now be responsible for all marketing, advertising, sales, distribution and

(Continued on following page)

Lott, Barker Accept AOTOS Awards

(Continued from previous page)

tor jobs are not enough. Public policy must support the maritime industry."

The senator encouraged the audience, "Remind the politicians that you represent American security." Senator Lott called for a balance of security in the U.S., saying that the merchant marine acting alone could not ensure economic security, just as without cooperation of merchant shippers, U.S. defense forces could not ensure national security.

He emphasized the need for cargo preference reforms and encouraged attendees "to promote a U.S.-flag fleet, manned by Americans, and built in U.S. yards," in order to achieve a "transportation export policy that is self-sufficient."

Senator Lott concluded his speech by calling for unity among the U.S. maritime industry as a whole: "It's important to set aside differences and pull together." And on Capitol Hill? "We will continue to pursue funding in the Appropriations Bill. We are going to provide action."



You talked, we listened

Recently, I invited you to fax your thoughts on Crowley Marine Services. Thank you for all the responses.

As a result of your feedback, we're streamlining our administrative procedures to make them more compatible with yours. We're customizing more vessels for your specific marine jobs, and we're empowering our people to make more decisions at the operations level.

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Sincerely,

Brent Stienecker
President, CMS, Inc.

CROWLEY MARINE SERVICES, INC.
Maritime Reporter/Engineering News

Floating Production Systems

A Growth Market for Shipbuilders and System Suppliers

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

IMA Associates, Inc. has published a new study that examines opportunities for builders, system suppliers and engineering firms in construction and conversion of floating production systems. The study looks at business opportunities over the next five to 10 years — and provides detailed information needed for establishing position in this rapidly evolving market sector. The following article is an excerpt from the report.

There are about 100 floating production systems operating in oil fields offshore Brazil, North Sea, Gulf of Mexico, Southeast Asia and other locations. IMA has identified another 70 near- and intermediate-term offshore projects suited to floating production — and some bullish industry estimates cite as many as 200 prospective offshore projects where floating systems would be a suitable option. This is a wide open market that should be of interest to all builders and marine systems suppliers.

Offshore production options

Three basic methods can be used for offshore oil and gas production — fixed steel or concrete structures, floating production plants and subsea production.

Each has unique features suitable to specific types of offshore fields. Fixed structures will likely be chosen for fields in shallower water with large recoverable reserves. Floating systems are advantageous in deep waters and for use in marginal oil fields. Subsea completion is still an early technology that is considered useful for connecting remote fields to a fixed or floating platform. The choice of technology is driven by water depth, type and amount of

recoverable field reserves, weather and sea conditions, area accessibility and other factors — sometimes including political considerations.

Types of floating production systems

A wide variety of technical solutions are available for floating production. A common thread running through all options is the ability to tap fields where the cost of fixed platforms would make development uneconomical.

- **Tension leg platforms** — The largest floating production system is the tension leg platform (TLP) — a massive \$1 billion structure intended for use in large fields where a fixed platform would not be technically or economically feasible. Utilizing buoyancy forces, the huge platform is held in place by steel tethers to the seabed, permitting only minimum horizontal motion. This technology dates from 1984 when Conoco installed the first TLP in the North Sea Hutton field. Five TLPs are currently in service — two in the Gulf of Mexico and three in the North Sea — and three new TLPs are under construction or planned.

- **Semi-submersibles** — There

(Continued on page 44)

FLOATING PRODUCTION SYSTEMS UNDER CONSTRUCTION OR PLANNED

Type System	No. of Units
Tension leg platforms.....	3
FPSO vessels.....	25
FPS semi-submersibles.....	20
Production spars.....	3
FSO barges & ships.....	10
Undecided.....	10

Source: IMA Associates, *Construction and Conversion of Floating Production Systems*, December 1995

(Continued from previous page)

planning efforts for the company's Plexus line of structural methacrylate adhesives.

ITW Adhesives is involved in the design, development, and production of methacrylate bonding agents, which are used for structural bonding in the marine and other industries.

For more information on ITW Adhesives
Circle 3 on Reader Service Card

84-M Incat Vessel Outfitted With Ruston Diesels

Five years after powering the first Incat Tasmania 74-m (242.7-ft.) wave piercing catamaran, Ruston Diesels, a subsidiary of GEC Alsthom Diesels, Ltd., was awarded a contract to supply four 20RK270 engines and gearboxes for the first of a new series of 84-m (275.5-ft.) Incat vessels. The vessel will be the 13th to be powered by RK270 engines, and will bring the total number of engines supplied to Incat for passenger and car carrying ferries to 52. The fast ferry will be supplied to Condor for operation between the southern coast of England and the Channel Islands. The contract is the first for the 20-cylinder RK270, launched at the Hong Kong Fast Ferry Conference earlier this year. The engine was developed to meet the increased power needs of larger and faster vessels, and reportedly has a low life operating cost and high power-to-weight ratio, thereby classed as a medium-speed engine. Ruston provides extensive engineering, operating and service support experience in the application of diesel engines for fast ferries.

For more information on Ruston Diesels
Circle 138 on Reader Service Card

Ulstein Verft Wins \$48 M Support Vessel Contract

A Dutch subsidiary of the international group Carl Offshore has placed an order with Ulstein Verft A.S. for a very large multi-purpose support vessel, with contract costs totaling approximately \$48 million. The contract includes an option for construction of a sister ship.

Due for delivery in January 1997, the vessel is a new design Ulstein developed to meet the requirements of the buyer. Measuring 336 ft. (102.5 m) long and 76.1 ft. (23.2 m) wide, the vessel will be equipped with diesel-electric propulsion, providing an installed power of 12,225 kW. High specification equipment will include dynamic positioning, a heli-deck, and a deepwater mooring system. The design and capacity of the vessel will permit a variety of work roles which require a high deadweight and DP capability, such as platform supply, pipe carrier, cable layer, flexible pipe layer, diving support, construction support and oil production testing.

For more information on Ulstein Verft
Circle 137 on Reader Service Card

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Circle 216 on Reader Service Card

Sun Princess Set To Debut Ahead Of Schedule



P&O's *Sun Princess* was scheduled to kick off its inaugural season of Caribbean cruises on December 2.

According to reports from Princess Cruises, a subsidiary of The Peninsular and Oriental Steam Navigation Company (P&O), its 77,000-ton new-

building *Sun Princess* will be the largest cruise ship afloat when it is delivered from Fincantieri's Monfalcone yard two weeks ahead of schedule —

with the first inaugural sailing scheduled to depart on December 2.

The vessel is 856 ft. (260.9 m) long and 106 ft. (32.3 m) wide, with a draft of 26 ft. (7.9 m), and accommodations for 900 passengers and 900 crew members. The cost of building the vessel, according to Princess Cruises' figures, was more than \$300 million. The vessel is registered in Italy, and classed by both Lloyd's and RINA. Design of the *Sun Princess* was provided by Njal Eide, Oslo, Norway, and Giacomo Mortola, Genoa, Italy.

Sun Princess is equipped with STN Atlas Elektronik's NACOS 45-2 Navigation Command System — the very system installed on P&O's *Oriana*, but with minor advances — which has the capacity to generate planned route data while also providing input and digital correction of electronic chart data for the Multipilot. The navigation system provides real-time comparisons between paper charts and ECDIS, and is compatible with the DX90-S57 data format of national hydrographic authorities, as well as other formats such as those offered by C-Map and the British Royal Navy's ARCS raster scan data system.

The launch of *Sun Princess* marked the 30th anniversary of Princess Cruises. The new vessel is the first of the new Grand class of ships that will be launched by Princess over the next three years. *Dawn Princess*, sistership to the vessel about to be launched, will debut in the spring of 1997, and another vessel, the 104,000-ton *Grand Princess*, is also scheduled for launch in 1997.

For information on P&O
Circle 95 on Reader Service Card

Trinity Delivers 127-Ft. Oceangoing Tug *J. George Betz*



Trinity Marine yard Moss Point Marine, Moss Point, Miss., recently delivered the *J. George Betz* to Bouchard Transportation of Hicksville, N.Y. The vessel is a 127-ft. (38.7-m) oceangoing tug, powered by two General Motors EMD 16-6454 F7B diesels, developing a total of 6,140 bhp. The diesels drive 140-in., 91-in. diameter, five-blade Bird Johnson propellers through Falk 3040 reverse/reduction gears with a ratio of 4.354:1. The vessel has a width of 37 ft. (11.2 m), a 19-ft. (5.7-m) draft, and is equipped with three IEC/Baylor 99 kW generators, driven by three Detroit Diesel 8-V71 engines. A Markey tow winch with 2,250 ft. (685.8 m) of wire with 120,000 lbs. of line pull will enable the tug to tow on the hawser. Bollard pull is estimated at 154,000 lbs. The vessel can carry 169,000 gallons of fuel, 4,800 gallons of oil, and 8,500 gallons of potable water. *J. George Betz* is classed to ABS Maltese Cross A1 towing service standards. The vessel is the 13th tug built by a Trinity shipyard for the New York company since 1969, and was christened recently in New Orleans by Joyce Betz, widow of *J. George Betz*, the vessel's namesake, who was a long-time executive at Bouchard.

For information on Trinity Marine
Circle 132 on Reader Service Card

Meyer Werft To Build More 14,800-GT Passenger Vessels For Indonesia

In early November, the Republic of Indonesia placed an order with Meyer Werft Shipyard of Papenburg, Germany, for two more



14,800-gt passenger vessels for inter-island traffic. Upon delivery of the new ships by the end of 1998, the yard will have delivered a total of 26 ships — 20 passenger ships, five cargo/passenger vessels, and one gas tanker — to Indonesia. The latest order is for replicas of the Dobonsolo type, with a length of 480.6 ft. (146.5 m) and a width of 76.7 ft. (23.4 m). The vessels will have a capacity of approximately 2,000 passengers.

For more information on Meyer Werft
Circle 135 on Reader Service Card

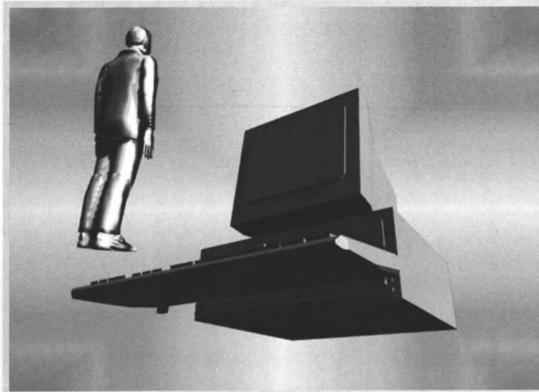
Delivery Of First Conofeeder 200 Series Vessel, M/V *Bermuda Islander*

Tille Shipyards, an associated yard of Conoship International, delivered the M/V *Bermuda Islander* to its Dutch owner Arma Shipping and Trading upon successful completion of sea trials. The vessel is the first of a new Conofeeder 200 Series, and will maintain a weekly container liner service between New York, New Jersey, and the tropical island.

Bermuda Islander is 295.2 ft. (90 m) long, and 45.1 ft. (13.7 m) wide, and operates at 13.5 knots. The vessel has a loaded container capacity of 182 TEU, and is powered by a non-reversible, four-stroke, in-line diesel engine driving a four-bladed propeller through a reduction gearbox. The vessel was constructed in compliance with the rules and regulations of Bureau Veritas designation I 3.3 Cargo ship/Containership Deepsea +mach. Aut-MS Iceclass 1N, and in agreement with the standards of the Netherlands Shipping Inspectorate.

Five more Conofeeder 200 vessels are currently on order. Conoship International's Conofeeder range consists of container vessels with capacities of between 200 and 900 TEUs.

For more information on Conoship International
Circle 134 on Reader Service Card



information technology

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Inventory Locator Service Allows Rapid Parts Location

Inventory Locator Service (ILS) is termed by its creators an electronic marketplace that brings buyers and sellers together. ILS encompasses all segments of the marine industry, and concentrates on providing accurate, helpful information so its clients can close the best deals.

Parts availability is readily determined using the ILS system. The user can locate parts with either a part number or model number and description.

ILS allows the user to locate parts worldwide very quickly, send a message broadcast to everyone accessing ILS at the time to request emergency help.

ILS Direct is a method of communicating with the marine marketplace electronically. As an ILS subscriber, each client has a private electronic mailbox that allows users to exchange messages across the globe with other ILS users, or send messages to virtually any fax machine.

For more information on ILS
Circle 32 on Reader Service Card

Intergraph CAD-2 Navy Deal Expanded To Include Info Tech

Intergraph Corporation has announced that the U.S. Navy has added Intergraph's suite of information management software to the \$422 million Facilities CAD-2 contract it had already placed. Designed for implementation throughout an enterprise-wide computing environment, DM2 software provides a complete information management solution which enables users to manage large and small format documents, engineering data and the workflows that deal with this information.

In a DM2 implementation, information can flow through the entire enterprise. Whether the data is raster images, CAD designs, text documents, ASCII files, video clips or audio files, the DM2 software suite manages the information and

relationships between information. DM2 provides the means to both define and refine the business processes in the organization, as well as the tools to implement and manage these processes.

DM2's multi-platform, client/server solution incorporates a graphical user interface (including a native Windows client), workflow support, and universal native-format viewing and redlining across supported systems. Combining object-oriented data modeling with an industry-standard relational database, DM2 can create a data management and access infrastructure customized to fit a customer's specific needs.

Tom Baybrook, Intergraph Federal Systems vice president of Federal Marketing and CAD-2, commented, "The addition of DM2 to the Facilities CAD-2 contract will provide installation managers

with the capability to revolutionize their data management and workflow processes. They will be able to realize immediate payback in increased productivity and efficiency."

Facilities CAD-2

Intergraph was selected by the U.S. Navy to provide computer-aided design and engineering (CAD/CAE) systems for architecture, engineering and construction (AEC), geographic information systems (GIS) and facilities management applications. The award is a major component of the Navy's approximately \$1.2 billion CAD-2 program for the acquisition of computer-aided design, manufacturing and engineering (CAD/CAM/CAE) systems based on commercial, off-the-shelf technology. The Facilities CAD-2 contract is the first opportunity for federal buyers to imple-

ment the concept of the The Technical Desktop with Windows NT, integrating technical and business applications in a single system, for maximum productivity and economy. The first CAD-2 contract, from the Naval Sea Systems Command (NAVSEA), was awarded to Intergraph in 1991. The most recent CAD-2 contract, from the Naval Air Systems Command and Space and Naval Warfare Systems Command, was awarded in 1994.

An agreement with the Department of Defense enables all branches of the U.S. military to buy from Facilities CAD-2. Civilian federal agencies such as the U.S. Coast Guard, the Department of Energy and the Environmental Protection Agency also may buy from this contract.

For more information on Intergraph
Circle 33 on Reader Service Card

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Fuel equipment needs constant attention. 'Round the clock, 'round the world, Goltens will save you valuable time and money. At Goltens, our trained experts use special testing and repair equipment as well as a huge inventory of replacement parts to help minimize your downtime. So if you have problems associated with your fuel equipment, count on Goltens. We'll do the job right away...and we'll do it right.

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Circle 227 on Reader Service Card

Volvo Debuts New Version Of TAMD163 For Workboats

At the EuroPort exhibition, Volvo Penta introduced a new version of its popular TAMD163P engine, the TAMD163A. This new version was designed for heavy duty operations in tough conditions, specifically targeting fishing vessels, ferries and other inland waterway applications.

The company reports the engine is also suitable for auxiliary purposes, including filling the role of a complete genset.

The TAMD163A is a six-cylinder, four-stroke direct-injected and turbo-charged diesel engine with a 144 mm bore and a 165 mm stroke. For more information from Volvo Penta Circle 67 on Reader Service Card

Desktop Simulator Used In USCG/USMMA Research Project

Officer of the Watch is a collision avoidance simulator used in a joint U.S. Coast Guard (USCG)/U.S. Merchant Marine Academy research project to evaluate the effectiveness of using a desktop, interactive simulator to test merchant marines on the "rules of the road."

The research involved putting 100 U.S. Merchant Marine Academy students through a series of watchkeeping tests in a traditional "paper and pencil" multiple choice format. The research analysis has recently been completed, and reportedly shows not only that additional aspects of "Rules of the Road" knowledge and applications are measured in the interactive simulator tests, but also that Officer of the Watch gives trainers the potential for setting, measuring and documenting common standards of watchkeeping proficiency and competency.

For more information from PC Maritime Circle 50 on Reader Service Card

Racal-Decca Launches New Product, Announces Contract At EuroPort

Racal-Decca Marine shared two significant announcements with the industry at the EuroPort exhibition in Amsterdam last month: the launch of its new dual capability ChartMaster and the selection of its ISIS (Integrated Ship Instrumentation System) product for a Canadian Fisheries vessel.

The company introduced an electronic charting system which is capable of displaying raster ARCS charts from the U.K. Hydrographic Office and vectorized charts. The new dual capability ChartMaster

is designed to enable users to create electronic chart portfolios using a combination of chart types according to their operational requirements and chart availability.

The ability to show ARCS charts enables users to operate with charts from an approved source. The vectorized chart capability opens the door for ChartMaster systems with an upgrade path

towards ECDIS when the standards have been finalized. The ChartMaster is available with a 20-in. screen, and can be installed as a stand-alone product or as part of the Racal-Decca MIRANS 2000 or 4000 series integrated navigation system.

The company also announced that an ISIS 250 Master Series alarm, monitoring and control system has been retro-fitted aboard

the survey vessel CSS *Parizeau*, which is operated by the Canadian Department of Fisheries and Oceans.

The installation is the first application of the new Master Series in Canada, and is being used to provide comprehensive monitoring of the ship's twin Deutz eight-cylinder engine, its generators and ancillary equipment. The ISIS has been fitted on more

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The sole purpose of this equipment is to separate water (H₂O) and salt (NaCl). Due to the nature of our multipatented anodes, powerful oxidants such as ozone and hydroxyl radicals are produced. This is not possible with other chlorine generators. The monatomic chlorine and oxygen produced is much safer than commercially available chlorines, and more effective in bleaching, sterilizing (not just disinfecting) and oxidizing. Model 300 also produces small amounts of caustic soda which acts as a stabilizing agent. To extend its shelf life, additional stabilizing agents may be added. For high purity chlorine, use distilled water and chemically pure NaCl.

HOW TO OPERATE MODEL 300:
Fill the plastic tank with 50 gallons (400 L) of water. Add from 1 to 10% industrial grade salt (NaCl). Immerse the cell into the saline mixture as illustrated. Activate the DC power supply. To increase the monatomic chlorine concentration (measured in ppm or mg/L) increase the amount of salt and the time of operation, until all of the salt has been electrolyzed. Chlorine concentration can be into the thousandths.

MAINTENANCE:
Eventually a white crusty layer of calcium will form upon the perforated electrode. To dissolve the calcium, simply immerse the cell into a 35% concentration of hydrochloric acid (HCl). In most cases, the procedure only takes a few minutes.

Model 300 is our small production model. We manufacture ten other models with capacities up to 50,000 gallons (200 M³) per day.

INPUT: 220 VAC
OUTPUT: 10 VDC 100 Amps, 1 KWH

SEPARATING SALT WATER OR SEA WATER TO MAKE MONATOMIC CHLORINE

PLASTIC TANK SHOWN:
50 gallons (200 liters)

March 1995
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than 300 vessels to date.
For more information on ChartMaster
Circle 48 on Reader Service Card

For more information on ISIS
Circle 49 on Reader Service Card

Comsat Streamlines Satcom Business, Upgrades Service

Chris Leber, vice president and general manager of Comsat

Mobile Communications (CMC), announced the completion of the business unit's reorganization and the appointment of a new management team for the mobile satellite communications services. The aeronautical, land-mobile and maritime services management team includes Kathryn Holman, vice president, sales; George Zachmann, vice president, major accounts; Gerry Nagler, vice president, business development;

Keith Regan, vice president, engineering and operations; Dan Swearingen, vice president, advanced engineering; and Jack Hannon, vice president, government relations. Comsat sought FCC approval for a restructuring under which CMC will be one of three business units of Comsat International Communications.

Comsat also completed a major upgrade of its C-Link satellite data messaging service in the Pacific

Ocean Region. Customers in the area will reportedly find the service easier, faster and less expensive to send e-mail, telex and fax messages via C-Link. The system improvements are coming on line automatically, and are available to most customers without need for an equipment modification.

For more information on Comsat
Circle 65 on Reader Service Card

Bolin Named VP At Sharp

Phil W. Bolin was named vice president in charge of George G. Sharp's Washington, D.C., office. Mr. Bolin retired from the Navy in March 1994, and joined the company shortly after. The company provides naval architecture and marine systems services, as well as ship design support and logistics.

For more information on
George G. Sharp, Inc.
Circle 2 on Reader Service Card

Magnavox Offers New Inmarsat-B Conversion Kit

Magnavox announced at the recent EuroPort exhibition that it plans to introduce an Inmarsat-B conversion program for the MX 2400 marine Inmarsat-A terminal early next year. The MX 2464 is a complete retrofit kit, including all of the components needed to convert the MX 2400 into an Inmarsat-B satellite ship terminal. The conversion kit is expected to be available in the second quarter of 1996, said William C. Euler, vice president, commercial satellite communications.

For more information on Magnavox
Circle 66 on Reader Service Card

M. Rosenblatt Wins Two Major Gov't Contracts

Last month, M. Rosenblatt & Son (MR&S), naval architects and marine engineers, was awarded two government contracts. The first supports the Military Sealift Command's (MSC's) Engineering Directorate, and the second supports the Hull, Mechanical and Electrical Systems (HM&E) of the Naval Sea Systems Command (NAVSEA). The MSC contract is for a base year and two option years with a ceiling of 110,000 work hours per year. This work will support MSC LANT and MSC PAC, as well as MSC headquarters in Washington, D.C.

The second contract is a \$17 million and 440,000 work-hour/year effort to provide engineering and design services to NAVSEA. This contract contains a base year and four option years. MR&S competed for this contract as the leader of a multi-company team that included, among others, Advanced Marine Enterprises, Gibbs & Cox, Newport News Shipbuilding and George G. Sharp.

For more information on MR&S
Circle 140 on Reader Service Card

Cost Comparison of Commercially Available 5.25% Sodium Hypochlorite (NaOCl) To the Equivalent Free Chlorine (Cl₂) Produced by Brinecell Model 300:

SODIUM HYPOCHLORITE (NaOCl)

By itself, NaOCl is useless. It becomes valuable when put to use. It then decomposes, releasing atomic chlorine (Cl). The molecular weight of NaOCl is 74 as follows: Na = 23, O = 16, Cl = 35. Therefore, the maximum possible atomic chlorine (Cl) in NaOCl is 48%. The concentration of most commercially available NaOCl is 5.25% when freshly made. At that concentration, the maximum available atomic chlorine (Cl) is 25,200 ppm (mg/L). However, the available free chlorine (Cl₂) is only half that, or 12,600 ppm (mg/L).

The cost of 1 gallon (4 L) NaOCl is anywhere from \$0.80 to \$3.00, depending on location.

BRINECELL MODEL 300 (Using proper full-wave DC power supply)

The scientific principle employed to produce free chlorine (Cl₂) is electrolysis. That is the separation of salt (NaCl) and water (H₂O) into their basic elements: sodium, chlorine, hydrogen and oxygen. The Cl₂ comes from the salt (NaCl). Brinecell Model 300 will electrolyze (produce) 50 gallons (200 L) of water seeded with 10% NaCl into at least 4,000 ppm (mg/L) of Cl₂. The total cost in energy, salt and water is less than \$1, or \$0.02 per gallon (4 L) Cl₂.

Thus, the Brinecell Model 300 produces free chlorine (Cl₂) at less than 1/3 the cost of NaOCl.

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We at Brinecell, Inc. have invented and patented an electrode making process in which solid metals are fused as one to produce electrodes with many years of life. They have the ability to carry voltages as high as 250 and power up to 100,000 Watts, operating 24 hours per day. Recirculating capacities range from 15 gpm (60 L) to 2,000 gpm (16 M³).

Some of the most important oxidants which are liberated in aqueous brine solutions with Brinecell electrodes include nascent ozone, nascent chlorine, and their respective hydroxyl radicals. Spontaneously liberated and working synergistically, these powerful oxidants are extremely economical and effective in oxidizing industrial and municipal effluents laden with all types and amounts of oxidizable organic compounds. Oxidation is to carbon dioxide (CO₂) and water (H₂O).

Time of oxidation depends upon the stability and concentration of the compounds, volume of effluent, concentration of NaCl used, pH manipulation, time of recirculation, size and model of Brinecell equipment used, and the voltage applied. The higher the NaCl concentration and voltage, the faster the oxidation rate.

Electrolytically activated sodium chloride solutions, using Brinecell electrodes, are extremely effective for use in the rapid bleaching of paper pulp, as well as cottons and synthetics. Because of the powerful oxidant mixture, bleaching time can be reduced to minutes with the temperature kept at or near 20°C. That way, extremely small amounts of chlorinated organic compounds are formed. Since the electrolyzed solution can destroy such compounds, treatment of the effluent with this solution would reduce the level of chloro-organic compounds even more, rendering it safe for legal discharge. In some cases, the used solution can be recycled—zero discharge.

Besides industrial uses, Brinecell electrodes have been in use since 1960 sterilizing drinking water, swimming pools, water cooling towers, industrial effluents, infectious medical waste, etc. The applications are virtually endless.

March 1995
Manufacturing Electrochemical Equipment in the United States of America Since 1960



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SHIPYARD TECHNOLOGY

ESAB Cutting Equipment Retrofit Benefits Marinette Juniper Class Construction

After winning the U.S. Coast Guard (USCG) contract for the construction of seven new vessels of the Juniper and Keeper classes, Marinette Marine, Marinette, Wis., contracted with ESAB Cutting Systems for a retrofit of its cutting equipment that had been provided by the same company in 1978. "With that potential on the horizon, we had to improve our plate-burning capacity and reduce the downtime we were



ESAB cutting equipment was used in construction of the USCG cutter newbuild recently launched by Marinette Marine.

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The printers are mounted in specially designed trays and separate VHF modules provide a flexible installation option.

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experiencing with our old equipment," said Marinette Shops Manufacturing Manager **Ron Hornick**.

After evaluating time and cost factors, and deciding that a retrofit was more reasonable than a new equipment purchase, the original ESAB L-T-C CM 150 mechanized shape-cutting machine was outfitted with new drives, control, power supplies and torches.

The CM 150 now features a Series 2000 Control that is reportedly much easier to use compared with the old UNC3 control, giving the yard the capability to program and nest parts on screen, minimizing scrap potential.

The old nitrogen plasma torches were replaced with a PT-15XL nitrogen/oxygen plasma torch, offering the choice of using nitrogen for plates more than one inch thick for quality cutting at less cost per foot than other plasma processes, or the use of oxygen for slag-free cutting of plates less than one inch thick.

An Omni height-sensing system was added to the torches, and the plate-punching system was upgraded — including a retractable punch capability that is 50 percent faster than the old equipment.

Additionally, the cross drive was upgraded from a friction drive to a precision rack and pinion drive to provide smoother operation.

For more information on
ESAB Cutting Equipment
Circle 14 on Reader Service Card



The ESAB retrofit included installation of a Series 2000 Control and a PT-15XL nitrogen/oxygen plasma torch with a height sensing mechanism.

Maritime Reporter/Engineering News

Oxytechnik Offers Innovative Shipbuilding Manufacturing Systems

Approximately two years ago, the German conglomerate Bremer Vulkan acquired two companies — Ingenieurtechnik Und Maschinenbau GmbH (IMG) and Oxytechnik — combined their experience and production capabilities, and began marketing resultant innovative shipbuilding design and manufacturing technology under the name Oxytechnik. Systems applications included

producing a high degree of reliability in the company's manufacturing technology.

For more information on Oxytechnik
Circle 15 on Reader Service Card



The Oxytechnik plasma system can cut plates up to 65 mm in thickness, and is equipped with a special design that allows cutting closer to the flanges.

in the Oxytechnik advanced manufacturing technology are panel welding lines, profile bending, robotic cutting, pipe processing systems and hardware and software for CAD systems — all of which are designed to be integrated for computer manufacturing programs.

Robotic Section Cutting

Robotic section cutting is a strong suit of Oxytechnik, which produces a system for cutting complicated 3-D shapes.

The plasma system enables cutting plate thicknesses up to 65 mm, and includes a special head design which allows cutting closer to the flanges.

Lines have been designed and delivered for one- or two-side welding.

The company's pipe processing system includes stations for shot blasting, painting, automatic welding of flanges, and the bending of flanged or standard piping, which can be controlled manually or by DNC from a central computer station.

Oxytechnik uses modern computer technology to allow simulation of the production process, pro-



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Willard Marine Delivers RIB To Innerspace Images



Sea Force 490 O/B powered by 70-hp Johnson outboard.

Willard Marine, Inc. of Anaheim, Calif., delivered a Sea Force® 490 O/B to Innerspace Images of Houston, Texas. The 490 RIB, powered by a 70-hp Johnson outboard, is to be used as a pilot, rescue and dive boat, according to Jamie Russel, owner of Innerspace Images. Willard Marine is one of the largest builders of RIBs in the U.S. and is a leading manufacturer of fiberglass boats for the U.S. Navy and

Coast Guard, as well as for commercial applications.

For more information on Willard Marine Circle 41 on Reader Service Card

Large Far East Contract Acquired By Dredging International



LPG Terminal at Bintulu.

Dredging International (DI) Singapore is reportedly making progress on its sub-contract for the major reclamation scheme at Jurong.

The project is a key phase in a development program linking five islands just south of Singapore in order to create one large "industrial island." DI Singapore's team began work in July 1995 on the Jurong Islands Reclamation Phase 1A subcontract, awarded by Japanese main contractor Penta Ocean.

This dredging, transport and pumping sub-contract is scheduled for completion next March.

In Malaysia, DI Singapore operates through its wholly-owned subsidiary, Tideway DI, in a joint venture with Malaysian-owned Malaysian Dredging Corporation (MDC). Presently, the Pearl River is working on DI Singapore's contract for dredging and reclamation at Port Klang, Malaysia.

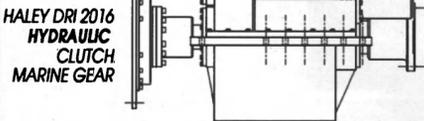
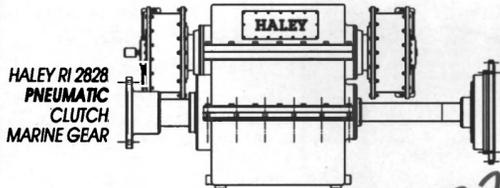
This contract was awarded to DI and MDC in consortium with two local companies by Central Spectrum, a grouping of three Selangor State agencies. It requires the dredging of five million cu. m. of sand, transport over a distance of 16 miles, and pumping ashore to the reclamation site.

This assignment is scheduled to be completed by February 1996. Additionally, the MDC consortium was awarded a second reclamation project requiring some 8.5 million cu. m. of sand to be pumped ashore. This contract is due for completion by the end of 1996.

Pearl River's tasks this year also include

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maintenance dredging at the large LNG and general cargo port of Bintulu, Sarawak. This is the first year of DI-MDC's four-year contract; 2.5 million cu. m. of silt will be removed from the port's navigation channels by the end 1995. DI has just started work on another contract at Bintulu — capital dredging and soil stabilization works for a new LPG terminal requiring 600,000 cu. m. of material and the reinforcement of the sea bottom subsoils next to an existing breakwater. This work should be completed in early 1996.

For more information on Dredging International
Circle 42 on Reader Service Card

New Concept Developed in Liquid Transportation

Elliot Bay Design Group (EBDG) of Seattle, Wash., has teamed up with Instant Terminalling and Ship Conversion, Inc. (ITASCI) of Houston, Texas, to develop a new concept in liquid transportation and storage systems. The ITASCI concept, originated and patented by designer Nick deBerardinis, reportedly combines some of the best features of intermodal shipping with the capability to transport a variety of liquid cargoes in a compartmentalized manner. ITASCI Modular Tank Units (MTUs) are reportedly self-contained 32 ft x 40 ft. x 8 ft. (9.8 m x 12.2 m x 2.4 m) tanks, fitting a traditional 40-ft. container footprint. Each includes its own load/unload deepwell pump and many other optional systems, and can be transported by existing terminal fork lifts and cranes.

A key element in the ITASCI program is that units to be offloaded at a destination site are shipped empty with corresponding full units below deck. Safety is a prime consideration, according to Mr. deBerardinis, who pointed out that compartmentalization, and thus cargo segregation, create inherent safety factors, such as double hulls. Other potential uses for the ITASCI container systems include import and export of liquid products, including relief materials such as water, fuel and pharmaceuticals.

"These MTUs enable a shipowner to convert his container or bulk ship to a specialty liquids carrier and vice versa, and also provide potential customers with the means to transport and store small quantities of specialty liquids without commingling," says Mr. de Berardinis.

According to EBDG President John Waterhouse, a demonstration prototype unit will be constructed soon and will undergo rigorous testing. "Safety at sea is a prime concern of our business, and that is what initially interested us in the ITASCI idea," he said. "We foresee a very successful future for the product due to its wide variety of applications."

For more information on EBDG
Circle 43 on Reader Service Card

Tenneco Delivers Aircraft Carrier Ahead Of Schedule

Newport News Shipbuilding, a unit of Tenneco, delivered the Nimitz class aircraft carrier USS John C. Stennis (CVN 74) to the U.S. Navy seven months ahead of schedule. The vessel reportedly incorporates nearly 1,200 up-

grades to the ship's design, systems and habitability compared to previous Nimitz class carriers, yet was constructed using one million man-hours less than used to build past carriers. "Delivering this ship prior to contract schedule illustrates that we're continuing to improve delivery and performance on each Nimitz class aircraft carrier," said Mike Shawcross, director, naval marketing. The keel was

laid in March, 1991; christening was performed on November 11, 1993 by Margaret Stennis Womble, the daughter of its namesake, the late Senator John C. Stennis of Mississippi. The ship, commissioned on December 9, 1995, will join the operating forces of the U.S. Atlantic Fleet.

For more information from Tenneco
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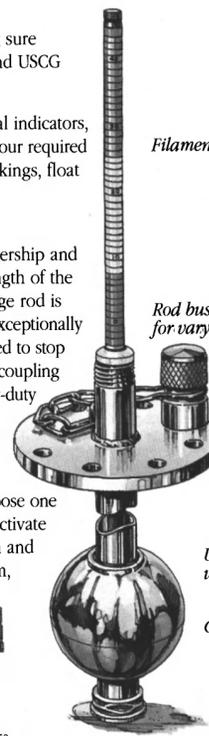
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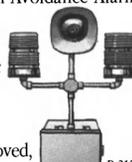
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Charting a course for efficiency

German yards make big strides to prosper

by Greg Trauthwein, editor

The German shipbuilding industry, like the shipbuilding industries of all nations, is in a constant state of change. And while this evolution includes some downside, such as the virtual elimination of repair work and the loss of some new-build projects to low-cost competitors, it has created a nation of resourceful, technologically advanced shipbuilders.

German yards are faced with a dynamic, diverse market, and the seemingly endless number of challenges includes a systematic reduction of subsidies; depressed new-build prices; restrictive national legislation; and a marked expansion by low-cost competitors.

German shipbuilders, long known for quality and efficiency, have been re-tooling yards and refining building processes, focusing on building specialized vessels in an attempt to stem the flow of business to the west and ensure its collective future well into the next century.

Tackling the issues

While German yards have traditionally supported (and lived with) the reduction of subsidies in the shipbuilding industry, most are skeptical that the OECD agreement (designed to eliminate shipbuilding subsidies on January 1, 1996) will have a significant effect on the balance of power in the industry when, and if, the accord is implemented.

Dr. Jurgen Rohweder of HDW points out that many factors play a role in today's depressed ship prices, namely the devaluation of the dollar and the expansion of capacity in Korea. More succinctly, he notes that "not all countries which build ships are members of the OECD," meaning, of course, that it will not prevent other nations from subsidizing its shipbuilding business.

Bremer Vulkan's Detlef Rother said the organization is looking forward to the institution of the OECD agreement, in hopes that with it, ship prices will rise. "With the elimination of subsidies, prices must rise," he said.

However, he also said that non-OECD members such as the shipbuilding nations of China and former Eastern Europe — which are

currently making strong in-roads — could counter the positive effects of the OECD agreement.

Subsidies and OECD matters aside, predictions for the market are generally upbeat, and it is with this hope that German yards create, implement and complete long-term plans to re-tool to win more business.

For example, Meyer-Werft Director Peter Motikat predicts that demand for cruise ships will rise steadily in the coming years, despite recent poor performance numbers from the cruise ship industry and a glut of ships coming on the market in the next three years. He said demand will be driven by two factors primarily: expansion of the cruise industry in the U.S. and S.E. Asia; and safety demands which will force older, inadequate tonnage from the market.

Bremer Vulkan's Mr. Rother similarly has faith long term in the cruise industry, saying "we still trust in this market... it will be very important to our marketing efforts."

The future is now

Kiel-based Howaldtswerke Deutsche Werft AG (HDW), with the support of the Federal Ministry for Research and Technology, is



The Contship Italy from Bremer Vulkan. On the background of this page is a schematic of Zi Yu Lan, built by HDW Schiffswerft, an innovative new passenger container vessel, type C11.

the early 1980s developed and implemented the successful concept of the Ship of the Future. The program will not result in one ship incorporating all of the program's concepts, per se, but has allowed HDW to include components developed under the program into all of its ships. HDW has built more than 1,500 ships in its history, and is well-known for its innovative container ships.

According to Dr. Rohweder, HDW plans to raise shipyard productivity to an even higher level, primarily through automation of its production systems. The yard was to have initiated its robotic welding of whole floor sections as MR/EN went to press.

HDW recently celebrated a christening ceremony with American President Lines (APL) for its new C11-class container ship, the APL Thailand. The 4,800-TEU post-Panamax vessel measures 905 ft. (276 m) long, and is the third of three C11s that APL has built at HDW.

"We congratulate HDW for the brilliant work they have done in

the design and construction of the C11s. These ships are expected to set the standard of excellence for post-Panamax vessels in the trans-Pacific trades for APL and the Global Alliance well into the 21st century," said Tim Rhein, president and CEO of American President Companies, Ltd.

The APL Thailand and its sisterships (one of which is featured in this year's review of Great Ships, on page 29, this issue) feature a 66,385-hp MAN B&W diesel engine, capable of powering the vessels at speeds up to 24.6 knots. Other features include highly advanced bridge navigation equipment; a large capacity shaft-powered main generator; and an on-deck lashing bridge container securing system developed by APL.

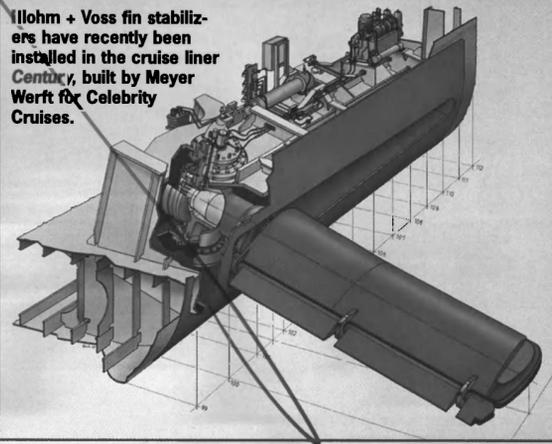
Papenburg-based Meyer Werft is also known for its automated processes and efficiencies, which have allowed the yard to compete in the rigorous passenger vessel segment. The yard's constant investment in the latest technology and ongoing evaluation of its production processes is driven by one

Fin Stabilizers From Blohm + Voss

Addressing the needs of comfort and safety on cruise vessels and ferries, Blohm + Voss' Mechanical Engineering Department has contributed such products as the Simplex-Compact Fin Stabilizer. The product is a highly efficient design which is positioned to fulfill many requirements, including: reduction of roll through the fully automatic adaptive control system; the anti-vortex tip; low noise levels; SOLAS requirement compliance; and low weight, low resistance and, hence, low fuel consumption.

Blohm + Voss fin stabilizers have recently been installed in the cruise liner Century, delivered recently by Meyer Werft to Celebrity Cruises.

For more information from Blohm + Voss
Circle 130 on Reader Service Card



Blohm + Voss fin stabilizers have recently been installed in the cruise liner Century, built by Meyer Werft for Celebrity Cruises.

GERMAN SHIPYARD REVIEW

factor, according to Mr. Motikat: "You can't be good, you have to be perfect in today's market."

Meyer Werft's ongoing successes can be attributed to many factors, but according to Mr. Motikat, much of the credit goes to the yards' modern covered building facility, efficient production processes (including incorporation of just-in-time delivery of parts) and its comprehensive CAD/CAM system, which provides for the seamless transfer of information throughout the design and building process. Mr. Motikat maintains that the latest CAD/CAM systems provide an unrivaled flexibility to shipyards, a flexibility needed to compete in today's market. "You want to have the most advanced vessel at delivery," which means you have to make changes late in the game. These tools allow you to do that.

Noting that it's difficult to single out only one factor as the reason driving Meyer Werft's efficiency, Mr. Motikat does point to its integrated CAD/CAM program — Catia, a program developed for the aircraft industry and used by Boeing, Airbus and BMW, among others — as allowing the yard to be flexible in design and redesign. "You want to have the most

**"You can't be good, you have to be perfect in today's market."
— Peter Motikat,
Meyer Werft**

advanced vessel at delivery, particularly in the cruise ship industry, and you have to make changes late in the game," he said. A fast, flexible computerized system allows this. Also, "with the type of ship we are building, it is important to have an integrated system for information transfer," Mr. Motikat said.

He went on to say that further efficiencies will come through enhancing the processes of steel production, pre-outfitting and automation (in terms of creating piping systems via CAD/CAM).

Massive Bremer Vulkan is in the midst of a re-organization which it has designed to maximize the efficiencies and promote the strengths of each of its yards. This reorganization will entail the centralization of the sales and projects departments, and the partial centralization of purchasing operations. The Bremer Vulkan yard itself is reorganizing production processes into eight manufacturing units. Specifically, Mr. Rother said market forces such as expanding capacity and falling prices have allowed the company to set the goal to increase efficiency 40 percent by the year 1999.

Finding its niche(s)

An emphasis of the German shipbuilding industry has been the development, marketing and building of innovative specialty vessels. This principle can be seen in the many innovative passenger vessels built by Meyer Werft, for owners in the U.S., the U.K. and

Indonesia. In its history, the yard has delivered eight cruise ships, 18 passenger vessels, about 30 car/passenger ferries, 25 livestock carriers and 45 gas tankers. The yard still has a pair of 14,800-gt passenger ships under construction for Indonesia, as well as the 73,000-gt cruise ship *Galaxy* for

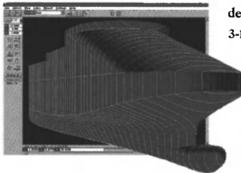
Celebrity Cruises.

MTW Schiffswerft recently delivered a unique, combined passenger/container vessel (type PCV 400) to Shanghai Shipping (Group) Co. The ship, which is one of two ordered, is designed to carry 392 passengers and 286 TEU (8.5-ft. high containers), and was devel-



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We define the structural members in **Autobuild**; the program automatically checks for interference and generates a bill of materials and a complete list of weights. That eliminates manual drafting, saves the yard manhours, and reduces the usual worry about weight.

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oped through co-operation between the yard and the Chinese shipping company. The cargo-carrying part is strictly separated from the passenger part, and the ships are designed to be used between towns with more than a million inhabitants located by rivers with depths suitable for sea-going ships. The main dimensions of the vessel are: 484 ft. (150.45 m) length, overall, a 78-ft. (24-m) breadth and a 22.5-ft. (6.85-m) design draft.

The completely welded ship's hull is constructed mainly of normal strength steel, with higher tensile steel used in boom areas.

The vessel is powered to a service speed of 20 knots by a pair of four-stroke (elastically seated) medium-speed diesel engines, type 6M 601. The engines transfer their output of 7,500 kW at 425 rpm to one controllable pitch propeller via its gear assembly. The propeller was built by Wismarer Propellerbau, constructed of manganese multi-alloy bronze.

Another recent significant delivery came from the Lindenau shipyard in Kiel. The *Jian She 52* was the second and last double hull oil tanker designed and built to the specification of an order from China National Machinery, Import & Export Corp., and delivered to Shanghai Shipping (Group) Co. These 13,144-dwt tankers are designed for the transport of crude oil, oil products and non-oil like substances, and each features the internationally patented Lindenau bulbous bow. The ships are powered by a MaK 6M/552C main engine to a speed of 14.75 knots at a constant engine output of 2,920 kW and a draft of 26.4 ft. (8 m).

Jian She 52 and its sister vessel are the first double hull oil tankers for the People's Republic of China built by Lindenau, and each belongs to the Lindenau Double Hull Tanker Class 2000, a ship design (of which there are 50 variants) ranging in size from 3,000 to 40,000 dwt.

Scanjet Receives Order From Stolt Parcel Tankers

Scanjet Tankcleaning of Sweden, has received a major order for tank cleaning equipment from Stolt Parcel Tankers Inc. of Houston, Texas. Scanjet will deliver more than 300 fixed installed tank cleaning machines of the multi-stage type to Stolt-Nielsen's three 37,000-dwt newbuildings at Ateliers et Chantiers du Havre in France, for delivery during 1996/1997. All machines are reportedly media-driven with pre-wash facilities, produced in stainless steel, fully programmable and will automatize the cleaning operation on board vessels.

For more information on Scanjet
Circle 36 on Reader Service Card

Natural Resource Damage Assessment

NOAA Prepares To Release Final OPA 90 Standards

by Bridget A. Murphy, assistant editor

As 1996 rapidly approaches, conservationists are taking comfort in the fact that OPA 90 regulations will soon pack an official punch. While shipbuilders, shipowners and operators — indeed, the maritime industry at large — rush to make adjustments in preparation for OPA compliance, National Oceanic and Atmospheric Administration (NOAA) officials are still busy hashing out a definitive natural resource damage assessment (NRDA) policy.

With an eye towards the OPA 90 goal of making the environment public and whole, NOAA has been tasked with the development of standards for the restoration, rehabilitation, replacement or acquisition of equivalent natural resources and services in oil spill disaster areas. A deadline of December 31 has been set for the release of final NRDA guidelines, and the agency is in the process of reforming 1994's rejected standards in favor of a policy that emphasizes environmental restor-

ation and compensable value, as opposed to a concentration on specific damage components. For example, according to the 1995 standards currently pending approval, in the case of damage to a virtually irreparable resource such as a coral reef, funds would be diverted to other environmental projects in the reef area in order to compensate for overall loss while the reef naturally regenerated over time; or monies paid by responsible parties would be contributed to separate development projects of equal value.

Pushing The Crisis Button

So what happens when there's a spill? According to Doug Helton, oil spill coordinator at NOAA's Damage Assessment Center, under OPA regulations, not all spills call for the agency to perform a damage assessment, a fact sometimes overlooked by shipowners and operators in their scramble to minimize liability and the impact of damages incurred by cargo leakage. In fact, NOAA's responsibility as a trustee — an agency responsible for

enforcing rules — demands intervention in an extremely small amount of cases. "Right now," said Mr. Helton, "our agency addresses one percent of the spill cases in the U.S. ... The first step is deciding whether the agency should bring to bear this (OPA 90-mandated) process."

In a presentation given on October 27 at the N.Y. Port Demonstration held at the U.S. Merchant Marine Academy at Kings Point, Mr. Helton explained the process by which NOAA officials perform damage assessments, which take place after determination that Department of Transportation involvement is warranted. The assessment of a particular crisis, usually in cases involving more than 10,000 gallons of spillage.

Executing A Damage Assessment

The NOAA's trusteeship of natural resources includes providing protection for shorelines and shoreline vegetation, oceans, intertidal resources, coral reefs, and

wildlife. When a spill within the realm of OPA rules occurs, the pre-assessment or damage scoping process involves determining whether injuries incurred to these or other natural resources are directly related to the cargo leakage. This can be tricky in well-trafficked areas such as the Port of N.Y./N.J. As explained by Mr. Helton, "The big issue here is causation; did the injury here result from this incident?" In the case of the *Valdez*, more than \$100 million was spent on studies merely assessing damages.

After establishing causation, the NOAA proceeds to the restoration planning stage, demonstrating to the party involved that its vessel caused the damages, and that it is responsible for participating in the restoration of the affected environs. In order to achieve this means, the agency uses evidence collected from examination of the habitat quality of underwater and nearby structures as well as news of beach closings that correspond with the spill location and time frame of the incident.

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OIL SPILL RESPONSE

Following the accomplishment of this objective, agency officials arrange negotiation with responsible parties in preparation for litigation and settlement, and at last, supervise the implementation of cleanup plans. The execution of a natural resource damage assessment is therefore divided into three major phases by the NOAA: pre-assessment; restoration planning; and restoration.

Establishing New Guidelines For Baseline Recovery

Natural resource damage assessments function in gauging whether spill-affected areas can be restored to their original condition. As stated by Mr. Helton, the primary challenge lies in answering the question, "Can we accelerate baseline recovery, and if so, how can we quantify the possibilities?" Another cause for concern is estab-

lishing techniques for scaling projects in order to prevent overcompensation of natural loss. The 1995 NRDA standards have been designed with these concerns in mind and with an emphasis on a "reasonable range of alternatives."

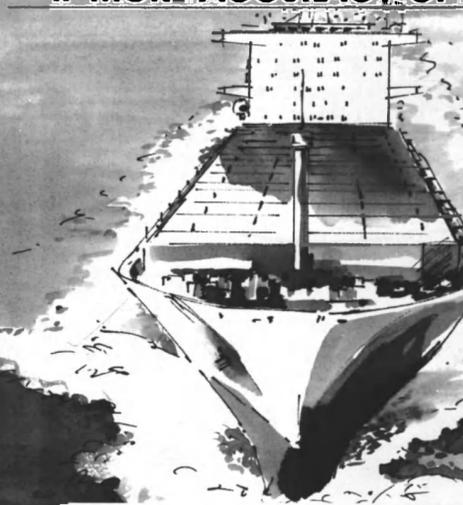
According to NOAA reports, the new assessment standards define injury as damage that is "measurable and observable," and are not

focused on punishing owners and operators, but instead, have a "strengthen(ed) focus on restoration." The agency will not release a statement as to a "standard of review." In fact, a range of injury assessment procedures will be available, and targeted compensation formulas will be devised for each incident.

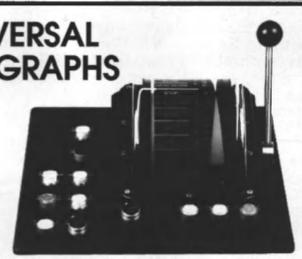
Assessing The Reality Of NRDA Implementation

As explained by NOAA representative Mr. Helton in late fall, the agency "is now responding to comments and making final changes" to the proposed NRDA assessment guidelines. And while the approved standards will undoubtedly be formulated to positively influence the recovery of natural resources after spill incidents, the question remains as to whether the NOAA will be capable of carrying out the large task of implementing these standards. The late days of 1995 in the 104th Congress have been characterized by an unrelenting budget lax, which has threatened to cut maritime-related funds, especially those allotted to NOAA. But according to Mr. Helton, NOAA budget cuts would not seriously affect the implementation of the OPA 90-mandated NRDA program: "The agency has a legal obligation to carry out projects, so the agency, even if dismantled, will be carrying out projects many years into the future," said the oil spill coordinator.

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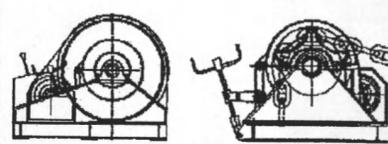
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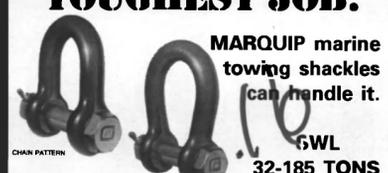
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In order to review or offer comments on proposed NRDA regulations, contact **Linda Burlington** at NOAA, 1315 East-West Highway, SSM3 #3, Rm. 15132, Silver Spring, Md. 20910, tel: (301) 713-1217.

Masciarotte To Serve As Managing Director

Dave Christensen, president of Christensen Shipyards, Ltd., has announced that **Mark Masciarotte** will serve as managing director of the company. Mr. Masciarotte moves to Christensen from Diana Yacht Design, Inc., where he has held the office of president since 1985. He has also served two terms as president of the Marine Industries Association of Florida, an organization which represents 1,200 marine businesses with annual revenues exceeding \$5 billion. Mr. Masciarotte is also a former director of the Superyacht Society, an internationally recognized marine industry organization.



Mark Masciarotte

For more information on Christensen Shipyards, Ltd.
Circle 4 on Reader Service Card

OIL SPILL RESPONSE

Everything But The Oil

ECM/Hudson Simulations Help Owners Prepare For Spill Responsibility

by Dan Maniotis, senior editor

It all began at 6:30 a.m. Friday morning — when, following an engine room fire that caused a loss of propulsion, a 584-ft. (178-m) tanker ran aground in the area of Robins Reef Light. She was inbound in the Kill Van Kull waterway, heading for IMTT Bayonne Terminal laden with a cargo of 51,043 cubic meters of #6 oil. The vessel had suffered ruptures in Tank Nos. 1 and 2, and was leaking its cargo into the waters surrounding the Port of New York/New Jersey.

The master of the vessel called and informed the owner's retained Qualified Individual (QI), Lewis J. Corcoran, one of the spill managers at ECM/Hudson Maritime Services, LLC. The QI immediately asked the master to fax him an incident report with all pertinent information, so the QI could inform the regulatory authorities on the particulars and mobilize the emergency cleanup response while the master did everything possible to contain the spill on the scene. Just about every maritime operation in the area was shut down — includ-

ing the Staten Island ferry, which meant thousands of commuters were cut off from their places of employment in the morning, and then from their homes that evening.

National Response Corp. (NRC) the owner's Oil Spill Response Organization (OSRO), and Don Jon Marine, the owner's salvage/firefighting contractors, were on the scene in a few short hours. NRC alone mobilized 8,000 feet of 24-inch boom, portable barges and a weir disc skimmer. By 7:20 a.m., a safety zone was established throughout the Upper Bay from the Verrazano Narrows Bridge North to the Brooklyn and George Washington bridges and along the Kill Van Kull to the Bayonne Bridge.

Nevertheless, the damage to the tanks was such that by 7:45 a.m., the Master reported he'd lost approximately 2,600 cu. m. of cargo from the 1 and 2 center cargo tanks, and that the outflow of oil continued. Results of an 8:00 a.m. overflight indicated oil was moving into the Kill Van Kull. New York

and New Jersey shorelines were oiled from Bergen Point/Con Hook to the Bayonne Bridge. The U.S. Coast Guard (USCG) closed Newark Bay to all vessel traffic.

Why haven't you read about any of this? Because it was all part of a detailed simulation carried out by ECM/Hudson, with offices in Wilton, Conn., Camden, N.J. and Houston, Texas. A relatively young company but backed by years of maritime experience, ECM/Hudson was formed when Environmental Crisis Management (ECM) merged with Hudson Maritime Services earlier this year.

Spill simulations such as the one which began with the previous scenario are provided for by the USCG's PREP Guideline, but there can be a dramatic difference between simply meeting regulatory requirements and achieving true preparedness — and ECM/Hudson has been emphasizing the latter.

Cynthia Hudson, vice president of ECM/Hudson and founder of

Hudson Maritime Services, puts it this way: "In spite of the latitude that the PREP guidelines have given," she says, "we've been able to find and define a pathway that makes it a really valuable experience for those owners that are taking the intention of the guideline seriously, and making a very good and a practical effort to handle the exercises responsibly."

ECM/Hudson's approach tests the organizational elements a shipowning company has in place, and says it accomplishes this at relatively modest expense — in no small part because no actual equipment is mobilized, other than telephones and fax machines.

"There are those who see these exercises as things they've got to do... They simply meet the regulations, and that's it," says Ms. Hudson. "We think you can do these kinds of exercises really for very little money. It doesn't have to be some extravagant event with thousands and thousands of dollars flying around. I think you can make a practical exercise from which you will really learn."

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Great Ships of 1995

The following is a quick guide to the vessels selected as "Great Ships." For additional information from the yards which built them, circle the appropriate number on the Reader Service Card bound in this issue.

Yard	Name	Type	Main Engine	RSC#
Astilleros Espanoles	<i>Lista</i>	Product Tanker	MAN B&W	51
Bremer Vulkan	<i>Hai Wang Ying</i>	Self-Unloading Bulk Carrier	MAN B&W	52
Daewoo	<i>Murex</i>	VLCC	Sulzer	53
Hanjin Heavy Industries	<i>Hanjin Pyeong Taek</i>	LNG	Mitsubishi*	54
Hitachi Zosen	<i>Atlantic Liberty</i>	VLCC	MAN B&W	55
HDW	<i>APL Japan</i>	Containership	MAN B&W	56
Hyundai Heavy Industries	<i>Hual Trooper</i>	RoRo Car Carrier	MAN B&W	57
IHI	<i>Rhine</i>	Containership	DU-Sulzer	58
Kawasaki Heavy Industries	<i>Eeklo</i>	LPG	MAN B&W	59
Kvaerner Masa-Yards, Turku	<i>Cable Innovator</i>	Cablesip	Wartsila & ABB	60
Mitsui Engineering & Shipldg.	<i>London Glory</i>	Tanker	B&W	61
Samsung	<i>Heidrun</i>	Shuttle Tanker	Wartsila	62
* steam turbine				

london glory



Yard: Mitsui Engineering & Shipbuilding
Name: London Glory
Type: Tanker
Owner: London & Overseas Freighters Ltd.

The *London Glory* is the seventh double-hull crude oil tanker built by MES and the fifth double-hull Suezmax tanker. The ship is designed and outfitted to exceed all international stan-

dards. To prevent oil spills due to collision or grounding, the ship's cargo and ballast tank arrangements satisfy IMO and OPA 90 double-hull tanker requirements. The cargo tank area is divided into 14 cargo oil tanks and 12 segregated ballast tanks. Cargo oil tanks are equipped with heating coils, and the cargo handling system is designed for segregation of three cargoes. Segregated ballast tanks are equipped

with inerting systems and fresh air ventilation systems as a safety measure. Finally, the gas recovery system is equipped for prevention of air pollution, and GMDSS is provided for safe navigation.

The vessel is powered by a Mitsui B&W 6S70MC. It is classed "+ 100A, Double Hull Oil Tanker ESP," *IWS, Ship Right (SDA, FDA, CM).

London Glory Data

Length.....	846 ft. (258 m)
Breadth, molded.....	151 ft. (46 m)
Depth, molded.....	78.4 ft. (23.9 m)
Draft, full load.....	55.4 ft. (16.9 m)
DWT, summer.....	149,834
Main engine.....	Mitsui B&W 6S70MC
Generator engines.....	Daihatsu
Generators.....	Nishishiba
Emergency generator.....	Stamford
Deck machinery.....	Fukushima
VHF radio.....	JRC
SSB radio.....	JRC
Radar.....	Kelvin Hughes
Autopilot.....	Tokimec
Air conditioning.....	Namirei
Liferafts.....	Viking
Classification.....	LR

hual trooper

Yard: Hyundai Heavy Industries
Name: Hual Trooper
Type: RoRo Car Carrier
Owner: Leif Hoegh & Co.

Hual Trooper is the second of the two 20,600-dwt RoRos built by Hyundai Heavy Industries Co., Ltd. (HHI) for Leif Hoegh & Co. The ship, delivered in March, has 12 car decks, four of them hoistable and eight fixed, capable of carrying high and heavy vehicles. The vessel has a total car carrying capacity of 5,689 units based on standard car size, with the net parking area of 54,069 cu. m.

The two shore ramps on the starboard side of the vessel lead to car deck No. 5. The side ramp, which is 82 ft. (25 m) long, has a maximum loading capacity of 22 metric tons and is arranged for alternative connection to car deck No. 6. The 125-ft. (38-m) long by 23-ft. (7-m) wide stern quarter ramp has a maximum loading capacity of 150 metric tons. From car deck No. 5, internal ramps are arranged leading to all other car decks.

The ship has nine movable ramps arranged between the decks to increase car loading capacity. As an open web construction, these movable ramps will be flush with surrounding deck when in stowed position. One Ulstein propeller CPP type bowthruster (1,800 hp/1,325 kW) is installed and electrically controlled from the wheelhouse.

The vessel is powered by a Hyundai MAN B&W 7S60MC main engine developing 17,510 bhp at 101.4 rpm, enabling a service speed of 20.1 knots.

Hual Trooper Data

Length o.a.....	656.1 ft. (199.98 m)
Width.....	106 ft. (32.2 m)
Draft.....	32.8 ft. (10 m)
Main engine.....	Hyundai MAN B&W
Auxiliary engines.....	Ulstein Bergen
Thrusters.....	Ulstein Propeller AS
Generator engines.....	Hyundai MAN B&W
Emergency generator.....	Ssangyong
Steering controls.....	Porsgrunn
Deck machinery.....	Ulstein Norwinch
Bearings.....	Blohm + Voss
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Radar.....	Kelvin-Hughes
GPS.....	Shipmate
Satcom.....	JRC
Navtex.....	JRC
Sound reception.....	Vingtor
Echosounder.....	Furuno
D.S. log.....	Consilium
Collision avoidance.....	Kelvin Hughes
Lifeboats.....	Norsafe
Liferafts.....	Viking
Waste management system.....	Nor-Control
RoRo equipment design.....	Kvaerner Ships
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apl japan

Yard: Howaldtswerke-Deutsche
Werft AG (HDW)
Ship: APL Japan
Type: Containership
Owner: American President Lines

Delivered on September 1, 1995, the *APL Japan* is the latest in a series of large, fast containerships from HDW. The APL order was unique in many facets, most notably in the size and speed of the vessel, but also in the fact that the order was split between HDW and Daewoo.

The *APL Japan* measures 905.5 x 131.2 x 46 ft. (276 x 40 x 14 m) and has a capacity for 4,830 TEU. In this arrangement, the ship transports 2,452 TEU in holds, 1,994 TEU on deck and 384 TEU on deck, fifth tier. Maximum slot capacity based on the maximum draft is 5,430 TEU. The ship's pontoon covers for the weather deck hatches are operated by shore cranes.

The 64,700-gt vessel is powered by a MAN B&W 11 K90 MC-C diesel engine — rated at 48,840 kW — to a service speed of 24.5 knots.

Automation onboard includes a microprocessor-based Centralized Alarm, Monitoring and Control system (CAMAC) with two display units in the Board Management Center, and two display units in the Ship Operation Center (SOC), offering color data representation. Special features include the SOC for one-man operation, anti-heeling system and central fresh cooling water system.

APL Japan Data

Length o.a. 905.5 ft. (276 m)
Length (bt perp.) 859.6 ft. (262 m)
Breadth, molded 131.2 ft. (40 m)



Depth, molded 79.7 ft. (24.3 m)
Draft, design 41 ft. (12.5 m)
Draft, max 46 ft. (14 m)
DWT, design draft 53,200
DWT, max, draft 66,300
GT 64,700
Crew 21
Capacity 4,830 TEU
Maximum slot cap.
based on max. draft 5,430 TEU
Ballast water 19,800 ton

Heavy oil 6,700 ton
Diesel oil 300 ton
Fresh water 250 ton
Speed, service at 90% MCR 24.5 kn.
Cruising range 20,000 nm
Fuel consumption abt. 178.2 ton/day
Main engine MAN B&W 11 K90 MC-C
Rating 48,840 kW
Generator engines 3 diesels, 2,100 kW ea
Emergency generator 390 kW
Hatch covers Pontoon covers

heidrun

Yard: Samsung
Name: Heidrun
Type: Shuttle Tanker
Owner: Conoco/USA

The *Heidrun* is a 125,800-dwt shuttle tanker built by Samsung for Conoco, Norway Inc. of the U.S. The *Heidrun* transports crude oil from the Heidrun field — located 75 miles south of the Arctic Circle in the Norwegian Sea. The vessel

is built with a double hull and is one of three direct loading shuttle tankers transporting oil to shore from the Heidrun platform.

The main propulsion unit adopts an electric power generating system using natural gas. It consists of four sets of main diesel generators and one double armature propulsion synchronous motor which connects to the propeller shaft and prevents the shuttle tanker from stopping operations, even in the event of power system troubles.

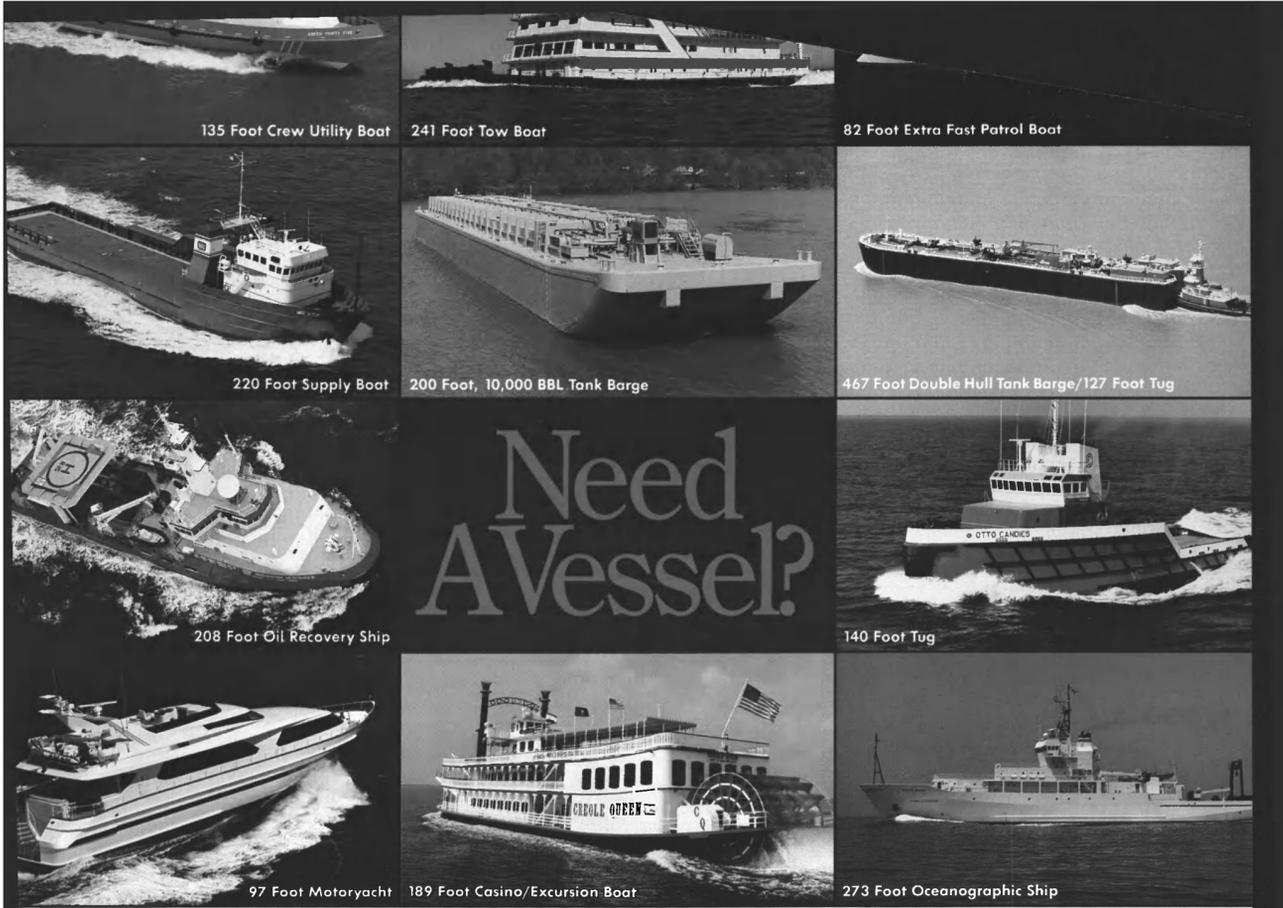
The maximum shaft propulsion power is approximately 19,100 kW at 98 rpm, and the service speed of the vessel is 15 knots at normal propulsion shaft power with 15 percent margin. The four sets of main diesel generator engine, Wartsila 8R46, supply the power for the motor which runs at a constant speed.

The cargo holds of the ship have six center oil tanks, six pairs of side oil tanks, two slop tanks and a water ballast tank. The total capacity of cargo oil tanks, including slop tanks, is approximately 140,800 cu. m.

The cargo oil pumping system is designed to discharge the cargo oil in all cargo oil tanks within about 14 hours. The ship is equipped with a Submerged Turret Loading (STL) and Bow Loading System (BLS) suitable for a 20-in. hose valve connection. The STL system directly loads oil from the platform through a buoy that is



(Continued on page 39)



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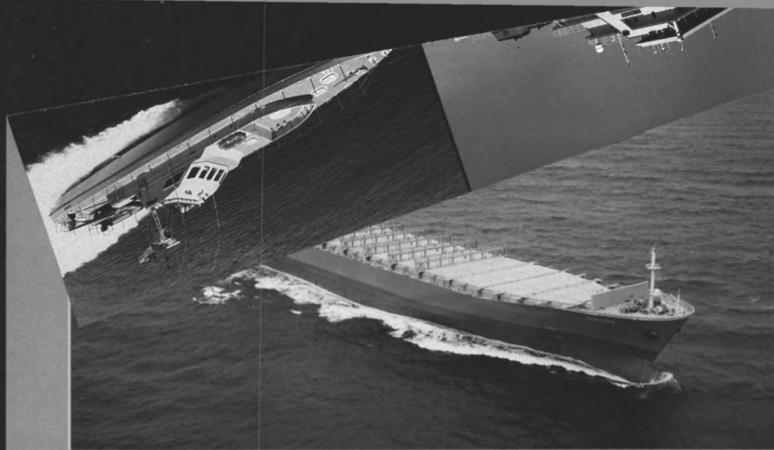


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Circle 261 on Reader Service Card



Yard: IHI Inc.
 Name: Rhine
 Type: Containership
 Owner: MOL Euro-Orient Shipping P.A.

The *Rhine* is the last of a series of 4,800-TEU class post panamax containerships which was developed specifically by IHI for customers which demanded larger, faster and more efficient containerships. Three sisters of the *Rhine* have been delivered to NYK Line and Mitsui

OSK Line of Japan.

This new generation of containership features strong lashing bridges arranged between batches for effective securing of deck containers of five high, and for easy handling of reefer containers of the second tier on deck. A new hull form is designed to provide good stability, as well as good propulsion performance at a wide range of drafts. The vessel is also designed to accept 400 reefer containers.

The 984-ft. (299.95-m) vessel is powered by

a Diesel United, Ltd. supplied, DU-Sulzer 12RTA84C driving a six-bladed solid nickel aluminum bronze propeller to provide an average speed of 23.5 knots. The vessel's cruising range is 20,900 nautical miles.

The *Rhine's* containers are held on five deck tiers, and can accommodate 2,264 TEU in the hold and 2,479 TEU on deck.

Rhine Data

Length o.a.....	984 ft. (299.95 m)
Breadth	121.7 ft. (37.1 m)
Draft (mid)	42.6 ft. (13 m)
DWT	62,905
Main engine	DU-Sulzer 12RTA84C
Propeller	Mitsubishi
Tailshaft	Nippon Cast Iron Works
Generator engine	Daihatsu Diesel
Bowthruster	KHI Kawasaki
Emergency generator.....	Daihatsu Diesel
Diesel generator	Taiyo Electric
Shaft generator	Taiyo Electric
Engine control	Terasaki Electric Co.
Steering Control.....	Yokogawa Electric
Windlass	Fukushima
Mooring winch	Fukushima
VHF radio	Furuno
Radar	Furuno
Gyro compass.....	Yokogawa Electronic
GPS	Sena Co.
Autopilot.....	Yokogawa Electronic

murex

Yard: Daewoo
 Name: Murex
 Type: VLCC
 Owner: Shell International Shipping Ltd.

The *Murex* is the first of the five double hull 298,300-dwt VLCCs for Shell International Shipping Ltd., from Daewoo. The Daewoo design has been extensively researched and developed based on a structural design philosophy "stronger, safer ships," complying with all of the latest international regulations on safety and environmental protection, such as IMO Marpol (13F) and OPA 90. The ship uses the double skin space to totally separate the cargo tanks from the sea and to provide the five U-shaped segregated water ballast tanks, connected to the double bottom tanks. The width of the double side tanks is 11.5 ft. (3.52 m) and the depth of the double bottom is 9.8 ft. (3 m), compared to the minimum values of 6.6 ft. (2 m) demanded in Marpol 13F. Many features have also been included to improve the fatigue strength, and as a result, the fatigue life of hull structural elements is guaranteed for 25 years. To achieve these ends: mild steel content has been increased to 73.3 percent; the use of T-bar type longitudinals has been increased to around 90 percent, from a normal proportion of about 60 percent; and bulb flats are used instead of inverted-angle stiffeners in the water ballast tanks to improve the quality of the coating.

Similarly, much attention was paid to the



selection of the correct coating. Light colored, bleached, tar epoxy paint is coated in the water ballast tanks, to make it easier to detect leakage of oil and corrosion through staining of paint. The coated film thickness is 300 microns. The main deck has been coated with a highly damage-resistant type zinc silicate from Hempel, and the thickness of coatings used has been increased to 850 microns, from the normal 600 microns for the main deck areas. The entire structure was designed, where possible, to minimize free edges and to eliminate blind spots.

Double slit type slot holes, reportedly for the first time in the world, were successfully incorporated on both sides of the floors and the webframes in the double side and the double bottom tanks, with no collar plates. This technique is designed to improve the structural strength and the corrosion prevention due to paint cracks.

For preventing corrosion in the sea water pipes, a polyethylene coating, inside, has been

(Continued on page 39)

great ships of 1995

Heldrun — Continued from page 32

picked up and inserted into an opening in the ship's hull.

Because of the rough conditions of the North Sea oil field, the ship is equipped with a powerful dynamic positioning system, which allows the vessel to maintain its position with the use of side thrusters and the main propeller alone in significant wave height of 23 ft. (7 m) during the connection operation to the turret. Once connected, it is possible to load the oil in wave heights of 50 ft. (15 m).

The ship's integrated control and alarm monitoring system is incorporated with the dynamic positioning system, including propulsion motor control and thruster control.

Heldrun Data

Length o.a. 869.4 ft. (265 m)
 Length b.p. 833.3 ft. (254 m)
 Breadth, molded 151 ft. (46 m)
 Depth, molded 74.1 ft. (22.6 m)
 Draft, design 49.2 ft. (15 m)
 Draft, scantling 50 ft. (15.25 m)
 DWT, at design draft 128,000 mt
 Light weight 25,500 mt
 Hull net steel weight 20,400 mt
 GT 172,500
 Service speed 15 kn
 Main engines Wartsila
 Main propulsion motors ABB
 Flag Liberian
 Classification ABS

Murex — Continued from page 34

applied. The ballast pipes are glass reinforced plastic construction.

The Murex is powered by a Sulzer 7RTA84T (derated) main engine, running at 85 percent MCR (30,600 hp) driving a fixed-pitch propeller and producing a service speed of 15.5 knots, with very low specific fuel consumption. An environmentally friendly, non-toxic water fog firefighting system protects all machinery spaces.

The arrangement of bridge control systems in the wheelhouse is featured for one-man bridge operation, fulfilling the latest LR LNC(AA) notation. A great deal of high technology hardware and software is onboard, with the intention of boosting safety even further. This includes the sophisticated INTEC command, alarm and monitoring system from ABB, and Racal-Decca's MIRANS (Modular Integrated Radar and Navigation System).

Murex Data

Length o.a. 1,089 ft. (332 m)
 Length b.p. 1,049 ft. (320 m)
 Breadth, molded 190 ft. (58 m)
 Depth, to main deck 102 ft. (31 m)
 Draft, design 68.3 ft. (20.8 m)
 GT 156,800
 Displacement 341,100
 DWT, scantling 298,300
 Service speed 15.5 kn (85% MCR)
 Classification LR
 Flag Liberia
 Main engine Sulzer 7RTA84T
 Gears Renk-Tacke
 Propeller Lips

December, 1995

Auxiliary diesel Ssangyong
 Boilers Mitsubishi
 Cranes MacGregor, Hagglunds
 Cargo pumps Shinko
 Cargo control system ABB
 Ballast control ABB
 Fire detection Thorn
 Fire extinguishing Unitor
 Radars Racal-Decca
 GPS Furuno
 Integrated navigation Racal-Decca
 Bridge control systems Norcontrol

Motor from preceding page

Lista Data

Length o.a. 557 ft. (170 m)
 Breadth, molded 79.7 ft. (24.3 m)
 Depth, molded 51.2 ft. (15.6 m)
 Draft, design 33.1 ft. (10.1 m)
 GT 17,750
 Main engines MAN B&W 6L35MC
 Gears Lohman & Stolterfoht
 Cargo handling Frank Mohn
 Boilers San Carlos

motor; four pumps rated at 540 cu.-m./h; one portable pump and 16 heaters (one for each tank) able to keep a constant temperature of 73 degrees Celsius with an outside temperature of -15 degrees Celsius and seawater at 0 degrees Celsius.

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Circle 238 on Reader Service Card

hanjin pyeong taek

Yard: Hanjin Heavy Industries
Ship: Hanjin Pyeong Taek
Type: LNG Carrier
Owner: Hanjin Shipping Co. Ltd.

The 130,600-cu.-m. *Hanjin Pyeong Taek* is reportedly Asia's first LNG carrier with a GT membrane type containment system. The vessel was built by Hanjin Heavy Industries for the purpose of importing liquefied natural gas (LNG) from Indonesia for the Korea Gas Corp.

With the Gaz Transport (GT) containment system, liquid natural gas is carried at -163 degrees Celsius and atmospheric pressure in a tank made of a thin membrane in the form of metallic sheets, which are constructed of a 36 percent nickel alloy in thicknesses of .7 mm (Invar). The coefficient of thermal expansion for the Invar is very low, therefore high thermal stresses do not occur in the membranes.

The insulation layer of the GT system is comprised of plywood boxes containing expanded perlite. This system is designed to sustain the liquid pressure, static and dynamic loads, and to keep the low daily boil-off rate of 0.15 percent of the total cargo volume.

Within each tank, the pumps and filling line are arranged on a tripod mast. Cargo loading is carried out by shore pumps, and vapor produced in this process is returned to shore by the ship's high duty compressors. Cargo unloading is carried out by two Ebara electric, submerged cargo pumps, located at the bottom of each tank.

The ship's propulsion system includes a



Mitsubishi MS 29-2 steam turbine, which develops 28,000 shp at 83 rpm, driving a single screw through double reduction gearing, providing a service speed of 19 knots. Two water boilers produce 50,000 kg/h of super-heated steam from oil or cargo gas.

The Centralized Administration and Control Center (CACC) provides a central command station for cargo and ballasting operation, as well as monitoring, remote control of the propulsion plant, integrated automation and shipboard management systems.

The vessel is outfitted with two entirely sepa-

rate TDC 3000 Basic systems from Yamatake-Honeywell, one for cargo/ballast operations, the other for machinery/electric generation.

The total navigation systems (TNS) were integrated by Mitsubishi and Atlas Elektronik. Mitsubishi supplied a TNS, Atlas Elektronik supplied three 960 radars, a 9600 S-band ARPA, a 9600 X-band ARPA, an Echograph 481 echosounder and a DOLOC 23 doppler sonar & docking system. Full GMDSS communication equipment was supplied by JRC. The ship also offers Sea-Tel's satellite television reception system.

cable innovator

Yard: Kvaerner Masa-Yards, Turku
Name: Cable Innovator
Type: Cable ship
Owner: Cable & Wireless

The *CS Cable Innovator* is the world's largest purpose built cable ship. With a gross tonnage of 14,000 tons and a deadweight of 9,400 tons, the ship has an overall length of 477 ft. (145.4 m), a breadth of 79 ft. (24 m) and a draft of 28 ft. (8.5 m). This new generation of cable

laying ship was developed especially for the growing fiber optic submarine cable market. It is intended for world-wide trans-ocean cable laying. The vessel features a fully stern-working concept, designed to enhance operational performance. The propulsion is arranged through a diesel-electric plant. The ship is fitted with a dynamic positioning system. There is accommodation provided for up to 80 crew and cable representatives, all in single berths.

Crew cabins, including a gymnasium and two

recreation rooms, are arranged on the main deck amidships and forward. Aft of this area on the main deck is the machinery control room workshops, the cable drum, the central store and cable equipment holds.

The ship's control center, a combined wheelhouse/operations control room, is located on the navigation bridge deck above the bridge deck. This combination is a new and improved feature. The ship is equipped with a dynamic positioning/joystick control system including taut wires, acoustic and Differential GPS connection. The dynamic positioning system, type DPS901, is supplied by Cegelec.

The *Cable Innovator* has a diesel-electric power station machinery with five diesel-generators supplying the common busbar. The marine diesel-generators consists of three Wartsila Vasa 9R32E/3,645 engines, each driving a 4,160-kVA/60Hz ABB Marine AC generator. The ship has two 2,700-kW (0-1,000 rpm) ABB propulsion motors which are driving a KaMeWA fixed pitch propeller in a steerable nozzle through a twin input, single output Valmet reduction gear. Four electrically driven thrusters are installed for ease of maneuverability.

The ship is designed to allow lay of all types of submarine communication cables and associated repeaters, regenerators, equalizers and joints. Onboard the ship there are two cable lies, one 13.1 ft. (4 m) diameter electrical cable drum and one 21 wheel pair linear cable engine.



atlantic liberty



Yard: Hitachi Zosen
Name: Atlantic Liberty
Type: VLCC
Owner: Exceed Shipping

The *Atlantic Liberty* is a 310,000-dwt VLCC ordered by Osaka Shosen Mitsui Senpan K.K. The ship was completed at the Ariake Works of

Hitachi Zosen. The tanker, under Panamanian registry, was christened and delivered to the owner, Exceed Shipping S.A. It was the second double-hull VLCC built by Hitachi Zosen, and was scheduled to be put into service on the Esso Sekiyu K.K. Middle East-North America route.

The tanker has the double-hull structure required by the International Convention for the Prevention of Pollution from Ships (Marpol 73/78), designed to ensure a greatly enhanced ability to prevent marine pollution in an accident. One of the features of Hitachi Zosen's double-hull VLCC is that it is equipped with wing ballast tanks. This design feature reportedly provides a good balance of hull strength and lowers steel reinforcement requirements, thereby reducing hull weight. The VLCC has acquired Safe Hull Notation and ESP notation certificates issued by the American Bureau of Shipping (ABS).

The vessel also has emergency towing equipment that becomes obligatory in January 1996 in accordance with SOLAS rules revised in 1994. The equipment is used to enable the ship to be towed by a tugboat or other vessel if the ship is unable to proceed on its own for any reason. The ship is also outfitted with a vapor control system to help protect the environment during the time of cargo loading.

The tanker is equipped with a Super Stream Duct nozzle, developed by Hitachi Zosen, in front of the propeller. A large bulbous bow is also provided below the water line. These greatly increase the tanker's propulsion efficiency. Moreover, the hull is coated with tin-free, self-polishing anti-fouling paint (SPC) to ensure long-term hull fouling prevention.

Atlantic Liberty Data

Length o.a.	1,304 ft. (329.7 m)
Breadth	190.2 ft. (58 m)
Depth	104.3 ft. (31.8 m)
Draft, summer	74.9 ft. (22.85 m)
GT	164,373
DWT	310,000 mt
Main engine	Hitachi Zosen
	MAN B&W 7S80MC
Speed	15.4 kt
Classification	ABS

eeklo

Yard: Kawasaki Heavy Industries
Name: Eeklo
Type: LPG

Kawasaki Heavy Industries built the 587-ft. (179-m) *Eeklo*, a 24,000-gt LPG carrier. The ship has an 89.8-ft. (27.36-m) molded breadth and a 37.4-ft. (11.4-m) design draft. The designed draft corresponds to the loaded condition with anhydrous ammonia (S.G. of 0.68, 98 percent full of specified volume) in all cargo tanks with fuel oil, water and stores for 15,000 nautical miles of navigation.

The cargo tank capacity of the vessel is about 37,450 cu. m., with a purging tank capacity of about 450 cu. m.

The ship is driven by a Kawasaki-MAN B&W 5S60MC, two-stroke cycle, crosshead reversible marine diesel engine with an exhaust gas turbocharger. Maximum continuous output is 13,900 PS (bhp) at 105 rpm, and normal output (90% MCR) is 12,910 PS (bhp) at about 101 rpm.

Trial speed on a trial ballast condition (displacement of about 16,400 tons) at maximum output with clean bottom, on calm and deep sea under no-wind and no-current condition is about 19.5 knots. Average service is about 17.2 knots. Fuel consumption rate at normal output is about 122.7 g/PS/h based on a fuel with a low calorific value of 10,200 kcal/kg. Fuel consumption at normal output is about 36.8 (38.3) t/day based on a fuel oil with a low calorific value

of 10,200 (9,800) kcal/kg. The vessel has a range of approximately 18,100 nautical miles.

Eeklo Data

Length o.a.	587.3 ft. (179 m)
Length b.p.	554.5 ft. (169 m)

Breadth, molded	89.8 ft. (27.36 m)
Depth, molded	59.7 ft. (18.2 m)
Draft, design	37.4 ft. (11.4 m)
DWT, on design draft	27,900
GT	24,000
Main engine	Kawasaki-MAN B&W 5S60MC
Flag	Luxemburg



FBM Places Repeat Order For 10 Turbines

FBM Marine Ltd. has placed a repeat order with Solar Turbines Incorporated for the manufacture of ten 5.2-MW (7,000-hp) Taurus 60M marine gas turbines. FBM Marine will install pairs of Taurus 60M gas turbines for propulsion aboard five 147.5-ft. (45-m), 318-passenger, high-speed "TriCat"

ferry boats to be built for the operator, CTS-Parkview Ferry Services of Hong Kong. The Taurus gas turbines will drive waterjets which propel the TriCat ferries at speeds of 50 knots.

The Taurus 60M plant is a two-shaft, variable-speed, marine gas turbine featuring: a 12-stage air compressor; single annular combustor; two-stage gas producer turbine; and two-stage power turbine, which is connected to the waterjet

via a speed-reduction gearbox and has a maximum continuous output speed of 12,900 rpm.

Solar Turbines, a San Diego, Calif. based subsidiary of Caterpillar Inc., designs and manufactures gas turbines and turbomachinery systems under quality management systems certified to ISO 9001 standards.

High-speed TriCat ferryboat powered by twin Taurus 60M marine gas turbines.



Crowley Awards Newbuild Contracts To Nichols Bros.

Crowley Marine Services has awarded Nichols Bros. Boat Builders a contract to build a pair of 5,500-bhp tractor tugs. The new tugs are due to be completed and ready for service in approximately one year. The tugs will be steel construction and each will be powered by a pair of Caterpillar 3606 diesel engines, and Voith Schneider model 32 propulsion units. Direct bollard pull is anticipated to be in excess of 50 tons; indirect bollard pull in excess of 150 tons.

Hvide Marine Agrees To Acquire OMI Ships

OMI Corp. announced that Hvide Marine had agreed to acquire three of the company's U.S.-flag chemical carriers, the *OMI Dynachem*, the *OMI Hudson* and the *OMI Star*. Hvide will also acquire OMI's 50 percent interest in Ocean Specialty Tankers Corp., which commercially manages Hvide's chemical tanker fleet and the vessels Hvide is acquiring.

The acquisition is pending MarAd and Federal Trade Commission approval, as well as the successful completion of Hvide's initial public offering.

Engineering Consultancies Merge

Babtie Oakervee Ltd. and Peter Fraenkel BMT (Asia) Ltd., two established Hong Kong engineering consultancies, have merged to form a new multi-disciplinary consultancy, Babtie BMT (Hong Kong) Ltd. The alliance is part of a joint venture by the companies' U.K.-based parent organizations — Babtie Group Ltd. and British Maritime Technology Ltd. (BMT) — and is intended to integrate and focus wide-ranging engineering, technical, and scientific resources on infrastructure projects within Hong Kong and the People's Republic of China. The new company will provide maritime, civil, structural, highway, geotechnical and environmental consultancy services. **Peter French** will serve as chairman of the new consultancy, and **Ross Barr** and **Henry Leung** will serve as joint managing directors.

For more information on Babtie BMT
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*Now,
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Can Operate
In The Black.*



TOP: Bulk carrier Maersk Taian.
LEFT: Double hull VLCC Atlantic Liberty.

Hitachi Zosen Completes Two Vessels

Hitachi Zosen Corporation has completed the *Maersk Taian*, a 71,747-dwt (metric) bulk carrier, for Dane Star S.A. and Palace Maritime Corporation, at its Maizuru Works. The vessel was delivered to its owners in October. This is the 79th Hitachi Panamax and first of the Hitachi Panamax Optima type, in which several improvements have been made — such as fuel savings through the use of a large propeller, and an increase of deadweight and cargo capacity. The vessel is equipped with an energy saving Hitachi Zosen MAN-B&W 6S60MC main engine and Hitachi Zosen Super Stream Duct (SSD) at its stern.

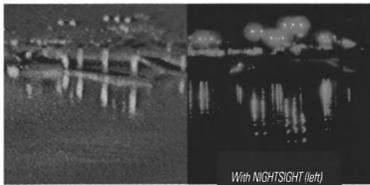
Atlantic Liberty, a 310,000-dwt VLCC ordered by Osaka Shosen Mitsui Senpaku K.K., was completed at the Ahiake Works of Hitachi Zosen. This is the second double hull VLCC built by Hitachi Zosen, and is scheduled to be put into service on the Esso Sekiyu K.K. Middle East-North America route. The tanker's double hull structure complies with MARPOL 73/78 requirements, is equipped with wing ballast tanks — and has acquired SafeHull and ESO Notation certificates issued by the American Bureau of Shipping (ABS). Emergency towing equipment, becoming obligatory in January 1996, is already installed, as is a vapor control system to prevent air pollution. The tanker is equipped with a Super Stream Duct nozzle, developed by Hitachi Zosen, in front of the propeller. Additionally, the Central Control Station has been moved from the engine control room to the wheelhouse, which reportedly contributes to safer navigation.

For more information on Hitachi Zosen
Circle 45 on Reader Service Card

Introducing NIGHTSIGHT



The weatherproof NIGHTSIGHT camera is available alone or with pan-and-tilt unit, remote control, cables, mounting ring and video monitor (left).



With NIGHTSIGHT (left) you spot boats, other objects and people in the water quickly, while some other night-vision systems (right) can leave you in the dark.



NIGHTSIGHT clarifies radar images with a false thermal picture of objects. It also helps separate those objects from cluttered backgrounds.

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The NIGHTSIGHT system uses Forward-Looking Infrared (FLIR) technology to detect the differences in heat that objects emit. So whether you're out in the open water or docking, NIGHTSIGHT can help you avoid danger even when there is no light. And unlike light-amplification systems, thermal imaging technology can help you distinguish objects and people in the water when visibility is limited by inclement weather, smoke or a cluttered background.

NIGHTSIGHT is a perfect complement to radar. Its black-and-white image helps you visualize objects that are creating echo signatures on your radar so you can quickly clarify whether they present a serious hazard.

Ready To Cast Off?

The \$7,995 (US) price includes the entire NIGHTSIGHT system: infrared camera, pan-and-tilt unit with remote control, mounting ring, 33-foot cable assembly and video monitor. You can rotate the camera in a full 360-degree sweep to probe for hazards without leaving the bridge.

For stationary applications, the NIGHTSIGHT camera is available alone at \$6,995 (US). It's a quick and easy replacement for a standard or low-light-level camera in fixed-mount locations like a vessel deck, harbor wharf or marina. And the weatherproof case eliminates the need for a special camera cover.

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INSTRUMENTS**
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08-1870

Reeve Named CYBO Robots General Manager

Bill Reeve has joined CYBO Robots, Indianapolis, Ind., as general manager. Mr. Reeve is a retired Air Force colonel who was responsible for developing and maintaining operational computer software and providing communications support. CYBO Robots specializes in the integration of production welding robots and is currently heading a team of companies developing welding robots for automated construction of warships and commercial vessels.

For more information on CYBO Robots
Circle 16 on Reader Service Card

FPSOs — A Growth Market
(Continued from page 13)

are now about 25 semi-submersible production units in operation — more than half of which are in service offshore Brazil. The remainder are found in the North Sea, Gulf of Mexico, offshore Africa and Southeast Asia.

Most are semi-submersible drill rigs converted for use as production units. However, there are five semi-submersibles now in opera-

tion that were purpose built for floating production — including the concrete semi-submersible recently placed in the Troll gas field. An additional 20 semi-submersibles are planned or under construction for use as floating production platforms. Some are intended for use in water depths exceeding 3,000 ft. (914 m).

• **Ship shapes** — Purpose-built or

converted monohulls — or ship shapes — used as floating production storage and offloading vessels (FPSOs) are also popular for floating production. Originally, FPSOs were intended for use in shallow, sheltered waters. The purpose-built FPSOs demonstrated over the past decade the inherent flexibility of FPSOs in a variety of applications. The 31,500-dwt ves-

sel is now working its seventh field in the North Sea. There are now 28 FPSOs in operation — typically working fields under 400 ft. (122 m), but one unit operating at 1,180 ft. (360 m) depth. More importantly, there are about 25 FPSOs planned or under construction. Several of these new units are intended for very deep fields. They are not cheap — a new FPSO designed to process 50,000 barrels per day will cost \$350 to 400 million.

• **Spars** — These are large cylindrical caissons that until now have been utilized for oil storage. Application of this technology has recently spread to floating production and a spar is currently under construction for use as a production unit in the Gulf of Mexico. It is being built for Oryx Energy to be installed in water depth of 2,000 ft. (610 m). The hull is 72 ft. (22 m) in diameter, 705 ft. (215 m) long — with a 2,500-ton deck atop the upright cylinder. Three other spars are under serious consideration. The attraction of spars is inherent platform stability, relatively low initial cost and the ability to disconnect and tow to another location.

• **Jack-ups** — Jack-up rigs converted for production are a fifth type of floating production system. While the platform does not float during production, it can be moved from one location to another. There have been a number of examples where jack-up production units have been used in marginal, shallow water fields — and the application is now spreading to deeper waters.

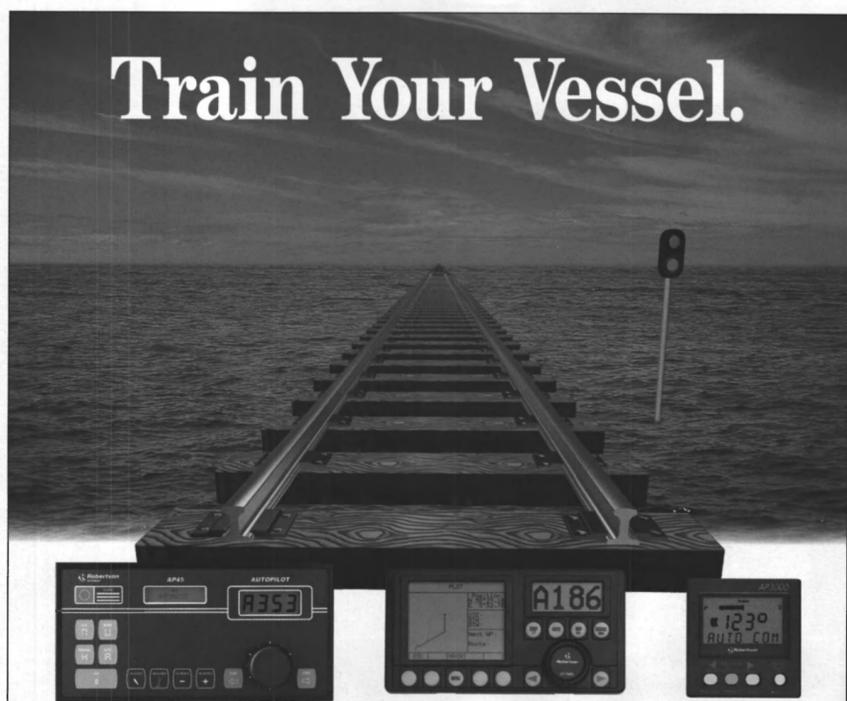
BP recently took delivery of TPG500, a 25,000-ton jack-up platform positioned in the 360 ft. (110 m) Harding field off the U.K. This jack-up is said to provide a big reduction in investment cost and BP is looking at using similar equipment on other projects.

• **Barges** — Barge-mounted floating production is particularly suited to remote locations in protected areas with limited accessibility. Such a system was recently selected for the N'Kissa field offshore the Congo. A 712-ft. (220-m) concrete barge was built to support production equipment able to process 116,000 barrels per day. The barge carries 30,000 tons of equipment and accommodates 160 persons. There are five barges now under construction or planned to be used as FPSOs or FSOs.

Opportunities for builders and suppliers

This is a booming market with loads of new business opportunities. Orders in hand represent a contract value of almost \$5 billion — and another \$4 billion in new contracts are approaching bidding stage.

Who should be interested in this market? Shipyards should obvi-



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Circle 251 on Reader Service Card

ously take a look at the possibilities of building or converting floating production systems. The Snorre TLP, for example, absorbed 2.2 million man-hours for topside and hull construction.

But beyond this, floating production units have a variety of complex equipment and there are many opportunities for machinery suppliers, system integrators and

engineering firms. These units have a large electrical requirement, utilize sophisticated mooring devices, incorporate an extensive cargo pumping system, require elaborate control systems and frequently need remote positioning capability. IMA believes that this is a market many companies should seriously examine for new business opportunities.

NEW IMA REPORT: FLOATING SYSTEMS

IMA's new study provides a comprehensive inventory of floating systems now in service or being built/converted; identifies offshore projects suited to floating production and storage; forecasts orders for purpose-built and conversion vessels; traces sources of buying power and decision-making for floating production systems; assesses competition for future construction and conversion

contracts; evaluates how these contracts overlap with other construction opportunities; and identifies changes in technology and systems likely to be incorporated in future vessel designs. *Construction and Conversion of Floating Production Systems* is available for \$675. To order, please contact: IMA Associates, Inc., 600 New Hampshire Ave., NW, Suite 140, Washington, D.C. 20037 USA; tel: (202) 333-8501; Fax: (202) 333-8504.

Avondale To Build Six Maritrans Tankers; Christens Minehunter

Maritrans Inc., Philadelphia, plans to lead a venture to build up to six new double-hulled petroleum tankers — and at press time, Avondale Shipyard's Division was awarded the contract. The deal, which is still subject to Title XI financing, calls for the vessels to be built over the next three to four years. The vessels would transport petroleum products between U.S. ports under the Jones Act.

According to **Stephen A. Van Dyck**, chairman and CEO, "Maritrans sees the addition of this capacity to our fleet as filling a market void left by retiring petroleum tankers. The federal Oil Pollution Act of 1990 mandates the retirement over the next seven years of single-hulled tankers operating in U.S. waters. This initiative is designed to keep Maritrans positioned to serve our customers' needs for safe and reliable transportation of environmentally sensitive cargoes well into the next century."

Maritrans had formed a subsidiary, Maritrans Ocean Transport Inc. (MOT), to contract for the construction of the tankers, with value estimated at approximately \$45 million each. The actual contract terms, however, were not disclosed.

Avondale Christens Osprey Class Minehunter *Cormorant*

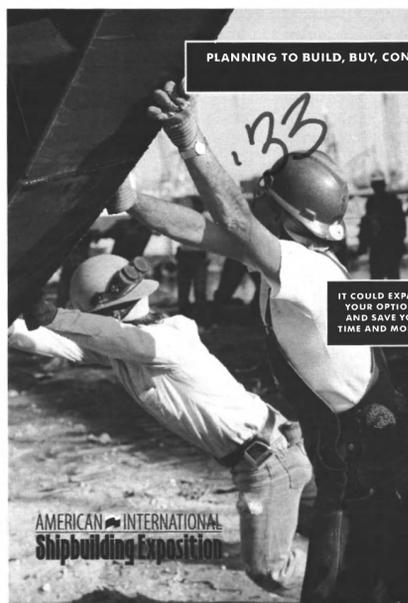
Avondale Industries christened its fourth MHC151 Osprey class Coastal minehunter *Cormorant*. The MHC 51 class ships are the world's largest class reinforced plastic (GRP) ships, and the first U.S. Navy ships designed solely for minehunting. The *Cormorant* will clear shore areas, harbors, and coastal and ocean waters of pressure/contact, acoustic, and magnetic type mines, utilizing reconnaissance, classification and neutralization tactics.

Suzanne Prueher, spouse of Admiral **Joseph W. Prueher**, USN, vice chief of naval operations, was the ship's sponsor. *Cormorant* is the seventh of 12 Osprey class ships scheduled to be constructed, and like her sister-ships, is 188 ft. (57.3 m) long, with a 36-ft. (10.9-m) beam, a draft of 9.2 ft. (2.8 m), and a displacement of 820 metric tons. The vessel accommodates a crew of 51, and has a service speed of 10 knots.

For more information on Avondale
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December, 1995

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Drewry Tanker Report Projects Newbuild Boom

In the wake of the 1990-1991 Gulf Crisis, freight rates have suffered from overtoning following a spate of deliveries from independent shipowners. Nonetheless, almost boundless optimism and then pessimism has prevailed against a background of an aging fleet and tightening regulatory environment.

What the market does not seem to have noticed is that freight rates have been improving steadily since 1994, and with almost two years of consolidation they are now poised to move more quickly towards a cyclical peak by the end of the decade.

These observations and more are included in a new report by Drewry Shipping Consultants, simply titled *The Tanker Market*.

Rates for product tankers benefited most in 1994, with consumption leading the way. In 1995, it has been the crude market that has improved, with steadily rising oil supplies from Latin America and Northern Europe. Tanker inactivity levels have remained broadly steady over the past 18 months, with swings in demand and supply being taken up by operating efficiencies within the overall fleet. The impact of refinery turnarounds created a brief surge in VLCC rates once purchases resumed in the middle of the year. Fluctuating crude values have boosted arbitrage trades from West Africa to Southeast Asia and North Europe to North America.

With the emphasis on fleet renewal moving through some of the main operators at a time of

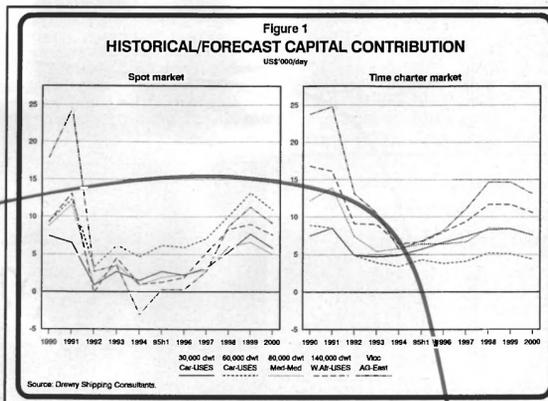


Figure 1

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firmer freight rates, the sale and purchase market has seen keen interest across all ages and sizes. There has even been an improvement in newbuilding values, although ordering levels have been falling steadily, leaving a yawning gap for many yards to fill in 1998. While demolition levels declined dramatically as freight rates rose in July, the fact remains that many VLCCs and ULCCs are unlikely to continue trading beyond fourth and fifth special surveys, with the result that the market balance is poised to tighten sharply.

Even in the current market, attractive returns are available. Panamax tankers have also sprung to the fore with a surge in S & P interest, and while being something of a niche, modern secondhand tonnage is strongly favored against the background of a virtually nonexistent orderbook. Aframax tankers may have derived much of the benefit from the demand side, but are set to perform solidly in the next few years.

However, even with the cyclical peak forecast through the end of the decade, Suezmax and VLCC tonnage is unlikely to offer the returns sought by most investors, even when a five-year-old vessel is probably discounted at one-third from its current newbuilding value.

Above, figure 1 shows forecast net revenues after deducting voyage and operating costs from gross revenues and reveals the way in which incomes are poised to rise as market fundamentals continue to change.

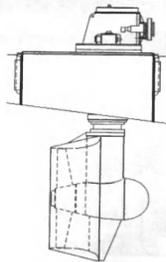
The latest report from Drewry presents a comprehensive view of the main factors at work in the market today. It profiles in detail crude and product, supply and consumption and highlights the changing pattern of seaborne trades. It thoroughly reviews trends in tanker chartering and freight rates, and developments in demand and supply. Detailed

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annual projections are contained to the year 2000. The forecast includes an analysis of operating costs and break-even freight rates. It includes projections of freight rates on a number of key spot trades and vessels most frequently fixed in the time charter market.

For more information on Drewry
Circle 63 on Reader Service Card

Spectra® Ropes Get Turbo-Charged

Puget Sound Rope Corporation has introduced a new product line of 12-strand Spectra fiber ropes, which is reportedly 50 percent stronger than existing high performance Spectra rope products. "This product represents a significant research breakthrough in the technology of process machinery which we've trade-named 'The Plasma Process,'" states Dick Ryan of Puget Sound Rope.

Reportedly, Plasma™ ropes are expected to gain quick acceptance by existing Spectra rope customers who are looking for higher strengths at reduced costs. According to Mr. Ryan, "These ropes closely replicate steel wire rope's break strength to diameter specifications while maintaining all of the ease and handling characteristics of a traditional 12-strand rope." Plasma ropes are being offered in diameters ranging from 7/16 in. to 2 in.

Puget Sound Rope is a leading manufacturer of premium quality single and double braided ropes of Spectra, nylon and polyester, and Spectra is a registered trade name of Allied Signal Inc.

For more information on
Puget Sound Rope
Circle 34 on Reader Service Card

Retrofitting Nitrogen Generator System Installed By Permea

The Norwegian gas processing specialist Permea Maritime Protection, a division of Air Product A/S, has completed a contract to supply a crude/product tanker with what is reported to be the world's largest nitrogen generation system using membrane technology. The system is designed to generate 1,500 Nm³/h of nitrogen with a maximum oxygen content of five percent, and has been installed on *MT Accord Express*. The contract was on a turnkey basis, including engineering, components, piping, installation and commissioning. The 19,900-dwt vessel is operated by Tortugas Shipping Company S.A., a subsidiary of Mitsui OSK Lines, for transport of oil products from Venezuela to the Caribbean. Normally, the classification societies do not require crude/product carriers under 20,000 dwt to be

equipped with inert gas systems. However, Port Authority in Puerto la Cruz has its own requirements allowing such.

The nitrogen system was delivered in August 1995 and installed during a sea voyage from Japan to Puerto la Cruz, with final commissioning taking place upon arrival. "This contract is significant for the forthcoming use of nitrogen systems onboard oil tankers below

20,000 dwt in size," says Mr. Steiner Andersen, sales manager of Permea Maritime Protection. "From now on, port authorities may require inert gas systems on ships smaller than 20,000 dwt for environmental control purposes."

By avoiding such costs as dry-docking and installation of seawater and fuel systems, the retrofitting nitrogen generator systems reportedly lower total-cost impact

over traditional inert gas combustion systems. The only operating cost for a nitrogen generating system is the onboard kW/h running cost for the feed air compressor(s).

Permea Maritime Protection is a manufacturer of membrane nitrogen systems, combustion inert gas systems and hydrogen recovery systems.

For more information on Permea
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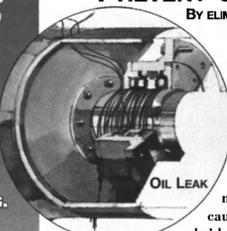
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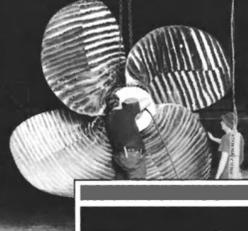
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ISM Compliance Assistance Offered By P and H Marine

P and H Marine Associates, Inc. of Wolfeboro Falls, N.H., has offered implementation consulting and training services for shipping companies faced with ISM Code compliance. Though the 1998 deadline is a long way off, P and H has report-

edly already seen success in assisting companies in passing certification audits to SEP rules.

P and H's staff of masters, chief engineers, and other professionals have repeatedly worked effectively in training shipboard and shore-based personnel to ensure a functional safety/quality management system that fulfills regulatory and customer demands. For more information on P and H Marine Circle 35 on Reader Service Card

Hughes Bros. Celebrates Anniversary

Hughes Bros., Inc., owner of a large fleet of inland and oceangoing deck barges and job-site tugs, recently celebrated its 101st year of business. The firm was founded by Irish immigrant Michael Hughes in the 1860s for the purpose of transporting coal from Pennsylvania to the New York



Bob, Bill and Joe Hughes (left to right) celebrate the beginning of their company's 101st business year on a dinner cruise in New York Harbor.

area. Hughes family partners Bob, Bill and Joe Hughes also manage the diversified marine firm James Hughes, Inc., which transports bulk cargo worldwide, and Hughes Maritime, co-owner of the Erie Basin Bargeport in Brooklyn, N.Y.

For more information on Hughes Bros. Circle 5 on Reader Service Card

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New developments

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Germanischer Lloyd Finds Korean Committee

On November 3, Germanischer Lloyd (GL) held the founding meeting of a new Korean Committee. The chairman of the new committee is Y.H. Kim, senior vice president of the Ship Design Department at Hyundai Heavy Industries in Ulsan. Heinz Wagner, GL's principal surveyor in Korea, will serve as secretary, and included in committee membership is Claus Vollers, the German Ambassador to Korea.

GL has been represented with a Korean branch office for 20 years. For more information on GL Circle 9 on Reader Service Card

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"K" Line Promotes Saeki

"K" Line America, Inc., an integrated intermodal transportation company, promoted Takashi Saeki to assistant vice president. He will be responsible for overseeing the daily marketing and pricing activities pertaining to the company's North American liner trades.

Globe Wireless Establishes New Zealand Station

In November, Globe Wireless opened a new public coast station in the company's Global Radio Network, located in New Zealand. Operations commenced on November 9, and the company's network of radio coverage for ships at sea now covers Europe, both U.S. coasts, the Atlantic and Pacific Oceans, the Panama Canal, the Caribbean Sea and the Gulf of Mexico.

For more information on Globe Wireless Circle 17 on Reader Service Card

MTI Debuts First Communications Stations Designed Specifically For The Bridge

Marine Technology International (MTI) has introduced what is reportedly the first communications station specifically designed to meet ISO 8468 bridge layout guidelines. The Solas Lifeline is a new, versatile communications station that is designed to make the installation and operation of GMDSS on the bridge a straightforward proposition.

This marine communications innovation will reportedly fit into any bridge layout, and can be bulkhead mounted, placed on a desk or mounted on its own purpose-built pedestal.

Key design criteria were ease of operation and installation. Engineered housings integrate all the control panels and operational equipment required for a full Area A3 communications station. According to the manufacturer, careful design considerations were given to every aspect and detail of operating a communications station on a ship's bridge, including size, flexibility of installation and positioning, lighting for night operation and ease of access.

The operator panels are housed in a rugged console which uses anti-vibration techniques for added protection and increased reliability. Access through the front panels makes maintenance a straightforward operation.

Battery chargers and power sup-

plies are housed in a separate unit, providing the option of positioning it off the bridge up to 98 ft. (30 m) away via an umbilical cable. Units are mounted on specially designed trays. The VHF units are also housed in separate specially designed modules to provide a flexible installation option to suit most any requirement.

Support services such as installa-

tion, training, shore-based maintenance contracts and worldwide technical support are part of the system's complete package.

For more information Circle 152 on Reader Service Card



UPPER RIGHT: Solas Lifeline is specifically designed for the bridge. ABOVE: The Solas Lifeline mounts easily on the bulkhead in tight situations.

Cummins Launches New Engine At EuroPort

Cummins Marine introduced the KTA50-M2 engine for use in a variety of commercial marine applications. The engine is now available at ratings of 1,700 bhp (1,268 kW) and 1,800 bhp (1,343 kW) for medium continuous-duty applications, and at 1,400 bhp (1,045 kW) and 1,600 bhp (1,194 kW) for continuous duty. Availability of the new engine is planned for early 1996.

A new Holset turbocharger, low-temperature aftercooling and a new gallery-cooled piston are among the major improvements featured in this engine. Typical applications for the KTA50-M2 include fishing vessels, tugs and barges, crewboats and ferries.

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Multi-use freighter takes to Chinese waters

Zi Yu Lan, the first of two 15,400-grt combined passenger/container vessels which possess serious challenges to cruise ship luxury, has been delivered to the operator Shanghai Shipping via the China National Machinery Import & Export Corporation (MACHIMPEX). Built by German yard MTW Schiffswerft, Zi Yu Lan — like her sister, scheduled to enter service in the first few months of next year — is of all steel construction with five decks for passenger accommodation and entertainment, three cargo holds and further on deck container capacity. Classified as GL +100 A5 Passenger-Container Ship +MC AUT, the vessel meets wide ranging international regulations including Suez Canal rules and U.S. Coast Guard (USCG) requirements for foreign ships in American waters.

On duty on routes which link highly populated towns and in areas such as Southeast Asia, Hong Kong, Korea and Japan where trade activities are brisk, the vessel, designated PCV 400, was ordered back in September 1993 to help relieve demands on China's congested air-lanes. The result is a 493.5-ft. l.o.a. by 78.7-ft. (150.5-m by 24-m) vessel capable of carrying 392 passengers and 286 TEUs of cargo. The cargo areas (in the fore of the ship) are strictly separated from those dedicated to passenger use. Drinking water is also carried in the fore part to compensate the trim when cargo is light. Passenger accommodation well meets operator requirements for comfort and has been designed by HSI-Sabert/Hamburg in association with AG Agne-Hamburg to include a variety of public rooms as well as a library, fitness center and outdoor swimming pools. A total of 120 cabins with private bath/shower rooms are on the first, second and poop decks. These are divided up into 46 two-person, first class cabins

and 74 four-person, second class cabins. Over 80 percent have sea views. Two luxury suites are positioned at the front end of deck three.

The main entrance for passengers includes a reception desk, bank and offices, and is located on the poop deck. A dancing saloon, situated in the aft part of the deckhouse, has been designed to seat around 120 persons and has facilities for shows and dancing, as well as video and karaoke equipment. The richly decorated casino and two restaurants are located on the first superstructure deck. The latter comprise a main area seating up to 140 and a separate 20-person room for family parties, etc. A shopping arcade with mirrored ceilings is positioned nearby.



Zi Yu Lan, which was recently delivered by MTW Schiffswerft to Shanghai Shipping.

Deck four offers sun loungers, library, pool and gymnasium as well as a cinema/conference room which is fitted with collapsible furniture for maximum versatility. Crew accommodation for 95 persons is situated on the second, upper

and fourth decks and common rooms on deck four. A health center with sauna and massage facilities is aft on deck 3 and a hospital block which includes an operating theatre on the upper deck.

Zi Yu Lan is powered by twin four-stroke, medium-speed MaK 6M601 diesels developing 7,500 kW at 425 rpm. A twin input, single output gearbox turns a single 17-ft. (5.2-m) Wismarin highly skewed cp propeller — manufactured of manganese alloy bronze, installed in a manner which obviates removal of the rudder when being mounted or dismounted. The single-screw system, allied with the fact that the vessel is of one-compartment design with fin stabilizers, ensures a high level of seakeeping and the required service speed of 20 knots. Auxiliary power is provided by three MaK 6 M20 diesel generators, which have an output of 1,020 kW at 1,000 rpm and operate on light heavy fuel oil. A 300-kW emergency diesel generator is also arranged on the bridge deck outside the engine room. Both main engines are subject to independent control, and remote control of the propeller plant can be effected from either the engine control room (ECR) or bridge/bridge wing positions. The monitoring system complies with Germanischer Lloyd for 24-hour periodically unattended machinery space. All essential engine and system data is fed into a central computer in the engine room and auxiliary systems are monitored on mimic diagrams on color monitors in the ECR, on the bridge and in the chief engineer's cabin.

Cargo is situated in 8.5-ft. (2.6-m) high containers on deck or in the three cargo holds. Approximately 185 TEUs can be positioned in up to seven rows and five tiers below deck and 101 TEUs on a seven row/two tier arrangement on deck. Thirty connections for reefer contain-

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Maritime Reporter/Engineering News

EUROPEAN UPDATE

ers are provided. In all the PCV can carry 3,450 tons of container cargo — meaning that around 83 percent of the containers can be carried with 14 tons of freight and the other containers carried empty. The upper deck houses an electrohydraulic crane with 36-ton/92-ft. (28-m) outreach to service cargo holds one and two, and for operation above the big store hatch behind the forecandle end bulkhead, the cargo crane has a maximum outreach of 98 ft. (30 m) at SWL 4 tons.

The deckhouse arranged aft on the poop deck has six decks including the wheelhouse, the top of which — with sheltered bridge wings — is constructed with a camber. The vessel is equipped with communication and radio systems which comply with national and international rules and has an intercom system connecting the bridge, fore and aft maneuvering station and engine room. An additional telephone system with over 280 extensions and 10 connecting sets also serves as alarm, entertainment and hotel service system. An extensive radio station is arranged beside the bridge and a Sea-Tel satellite receiving system installed on the wheelhouse top.

Navigational aids include a Standard 20 gyro-

compass in the chart table, a Satcom Standard A system and Reflecta Fiberline (Cassens & Plath) magnetic compass. A Nautopilot D steering gear control and autopilot, Decca MK 342/8 and 343 daylight viewing radars and X and S band radars are installed in the bridge desk. Additional radar screens have also been fitted on the bridge wings. The package is completed with a Dolog 23 biaxial Doppler log, Angulus 3 radio direction finder; Navtrak XL satnav; Lorac-LRX 22P navigator; echosounder, weather chart and Navtex receiver.

Spanish yard builds trainee patrol

The Spanish yard of Rodman Polyships has deviated from current activity in the patrol boat market with the delivery of *Hermano Gines*, an 83.3-ft. (25.4-m) oceanographic research vessel built for a religious education foundation in Venezuela.

Although differing from recent deliveries such

as the series of Rodman 46 vessels just completed for Spanish Customs, the Venezuelan boat is nevertheless the product of the yard's considerable experience in molding small scientific and training vessels based on standard Glass Reinforced Plastic (GRP) hulls.

The Fundacion la Salle Venezuela ordered



Hermano Gines, delivered by Rodman Polyships of Spain to a religious education foundation in Venezuela.

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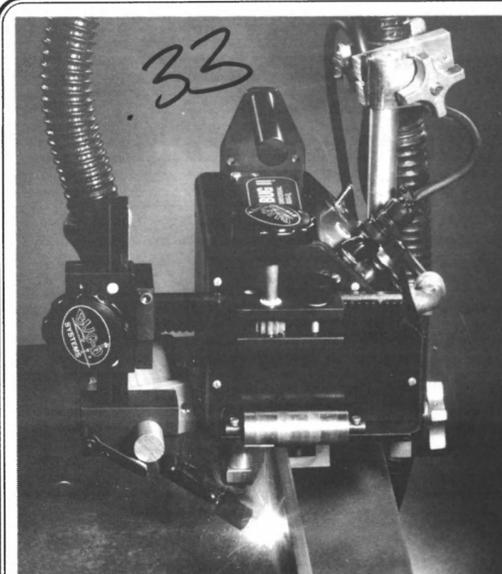
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52

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Hermano Gines to replace a 131-ft. (40-m) long vessel which it received by donation around 30 years ago. Although smaller than its predecessor, it has a beam of 21.6 ft. (6.6 m) and is very well equipped for split duties of training and scientific work. Sailing in Venezuelan waters only, with a crew of six, the vessel assists in training seven fishermen in fishing methods or, alternatively, carries six scientists when switching to oceanographic research.

Main fishing methods are midwater and bottom trawling for fish and shrimp, longlining, potting and trapping, to be carried out on week-long trips. *Hermano Gines* works in water depths of between 20 and 1,000 fathoms for periods of up to 15 days, most commonly encountering sardine, shrimp, red snapper, tuna and shark.

Spacious crew and laboratory facilities are incorporated in the design along with freezing and refrigerating facilities in the form of a small-scale freezing tunnel and 8-cu.-m. hold for training in fish handling and preservation methods. The vessel's full package of scientific, communication and navigation equipment is almost exclusively from Furuno, including GPS, plotter, gyro, railars, fax and Doppler log. A Simrad EQ-50 echosounder is also included. Scientific equipment includes sounders from Furuno, Simrad and Sea Cat as well as other measuring equipment. Auxiliary data processing is included for navigational and scientific data collection and integration.

Hermano Gines is powered by a Caterpillar 3408 main engine developing 402 hp at 1,800 rpm and driving a KaMeWa-Balino controllable pitch propeller.

French deliver first OPV to Morocco



Rais Bargach is the first of four offshore patrol vessels ordered by the Moroccan government from French yard Leroux et Lotz.

An early December delivery following a month of sea trials is the schedule for *Rais Bargach*, a 210-ft. (64-m) offshore patrol vessel, the first of four ordered by the Moroccan Government from the French yard of Leroux et Lotz Naval. It is also the first Offshore Patrol Vessel (OPV) of this size to be built by the yard from its range of five similar standard designs which span from 115 to 275 ft. (35 to 84 m) in length. One 177-ft. (54-m) version has already been supplied to Mauritania, and three more of this shorter type are currently in build including the nearly completed *Cormoran* for the French navy.

Work on *Rais Bargach* began in November 1994, within weeks of the establishment by Leroux et Lotz of a new shipbuilding facility at Le Rohu, Lorient with a covered erection hall and launching berth for vessels up to 260 ft. (110 m). The speed of construction owes much to the design concept, common to the range, which consists of a standard operationally effective patrol boat employing a basic simplicity of build techniques in conventional, well-understood materials and the use of proven equipment. Its innovative quality is its multi-role flexibility and adaptability for general surveillance and intervention with provision for firefighting, anti-pollution activities, towing, armaments, medical assistance and heli-

Maritime Reporter/Engineering News

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copter operations — some as standard items, others as optional extras.

The entire series has steel hulls and light alloy superstructures. More specifically, the OPV 64 for Morocco uses two independent shaft lines, each comprising a Wartsila Nohab V16 diesel of 5,000 hp driving a 2,000-mm diameter KaMeWa controllable pitch propeller through a Maag gearbox. This configuration gives the 600-ton vessel a maximum speed of 24 knots, an operating range at 12 knots of 4,000 nautical miles and an endurance of 20 days. However, this would be considerably extended by use of the electric loiter drive system which, even when used alone, would give an impressive top speed of eight knots. Other propulsion options are available with maximum speeds of 28 and 32 knots.

Also located below the main deck are the majority of the ship's 54 berths, laundry and ample storage space, while on the main deck level the superstructure contains an exceptionally spacious sick bay, separate wardrooms for officers and petty officers, ratings mess room, two offices, galley and emergency genset room.

Aft of the wheelhouse is the captain's cabin and wardroom, two additional offices, operations center and chart room. The bridge is well furnished with the predictable electronic components such as GPS, sounder, VHF, UHF and autopilot but, in addition, there are two Decca Bridgemaster radar systems with ARPA.

Undoubtedly the 400-cu.-m./hr. water monitor will have a policing role in addition to providing fire-fighting assistance; however, two 5-cu.-m. dispersant tanks and a pair of 26.2-ft. (8-m) long dispersant booms may be considered unusual items on a vessel which also carries 40- and 76-mm guns and unspecified missiles.

Launch of the next three vessels in the initial Moroccan Government contract is scheduled to take place at regular six-month intervals and, according to Gerard de la Cochetiere of the company's Military Department, an order for a fifth OPV is expected shortly from the same source.

Irish pelagic twins

The Norwegian yard of Flekkefjord Slipp took less than a year from receipt of order to the simultaneous delivery of two identical 145-ft. (44-m) pelagic trawlers for Irish owners in contracts worth a total of \$18.6 million. *Brendelen* and *Father McKee* replace older vessels of the same names, and look set to carry on the tradition established by their predecessors — the most successful pair trawlers in the Irish sector.

The vessels were also designed in Norway, by the Alesund-based Skipsteknisk A/S, and have 145-ft. by 36-ft. (44.2-m by 11-m) steel hulls with aluminum superstructures, offering a high level of comfort for the crew, which is accom-

modated in four single and six double cabins. Six insulated fish holds with Teknotherm refrigeration systems provide a total capacity of 880 cu. m.

Each vessel is powered by a Caterpillar 3608TA diesel develop-

ing 3,700 hp at 1,000 rpm, driving a 11.2-ft. (3.4-m) Volda controllable pitch propeller inside a nozzle through a Volda gearbox with a 6:1 reduction ratio. Caterpillar also

(Continued on page 56)

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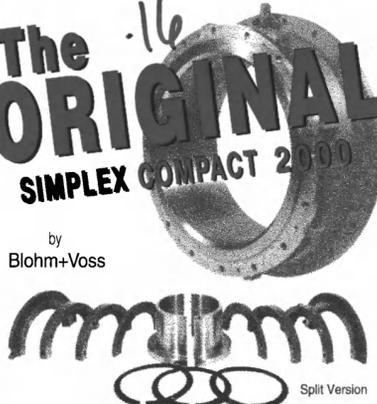
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WORLD ORDERBOOK STATISTICS

Yard Vessel Name	Type	Dimensions (LxWxD in m)	Engine	Owner	Price (US\$)	Delivery Date
Aukra Industrier AS, Aukra, Norway — Circle 101 on the Reader Service Card						
Yard No. 96	Chemical Tanker	123.8 x 19.2 x 9.5	Wartsila 6L 38 3960	Anders Uthkens Rederi AS		2/96
Yard No. 97	Chemical Tanker	123.8 x 19.2 x 9.5	Wartsila 6L 38 3960	Anders Uthkens Rederi AS		9/96
Austral Ships, Melbourne, Australia — Circle 102 on the Reader Service Card						
TBA	Vehicle and Passenger Cat	82.3 x 23 x 2.5	MTU	T.B.A.	38 M	T.B.A.
Avondale Industries, Inc., New Orleans, La. — Circle 103 on the Reader Service Card						
Robin	Minehunter (MHC 54)	57.3 x 10.5 x 5.1	—	U.S. Navy		2/9/96
Oak Hill	Landing Ship Dock	185.8 x 25.6 x 13.4	—	U.S. Navy		3/29/96
Laramie	Aux. Oiler (TAO 203)	206.5 x 29.7 x 15.2	—	U.S. Navy		4/5/96
S.S. King	Double Hull Tanker	202.3 x 27.4 x 16.4	—	American Heavy Lift		7/18/96
King Fisher	Minehunter (MHC 56)	57.3 x 10.5 x 5.1	—	U.S. Navy		8/9/96
S.S. Knight	Double Hull Tanker	207.3 x 27.4 x 16.4	—	American Heavy Lift		10/4/96
Commandant	Minehunter (MHC 57)	57.3 x 10.5 x 5.1	—	U.S. Navy		1/3/97
S.S. Spray	Double Hull Tanker	201.2 x 27.4 x 16.4	—	American Heavy Lift		4/4/97
S.S. Saker	Double Hull Tanker	201.2 x 27.4 x 16.4	—	American Heavy Lift		1/21/98
Bob Hope	Strategic Sealift Ship	289.6 x 32 x 28	—	U.S. Navy		4/30/98
Paarl Harbor	Landing Ship Dock	185.8 x 25.6 x 13.4	—	U.S. Navy		6/15/98
Healy	Polar Icebreaker	128.4 x 25 x 12.8	—	U.S. Navy		7/30/98
Fisher	Strategic Sealift Ship	289.6 x 32 x 28	—	U.S. Navy		1/31/99
Unnamed	Strategic Sealift Ship	289.6 x 32 x 28	—	U.S. Navy		
Blohm + Voess AG, Hamburg, Germany — Circle 104 on the Reader Service Card						
Hull No. 963	Container	156 x 27.4 x 13.2	Mitsubishi 7UGC 60LS	Maritime GmbH		5/96
Bollinger, Lockport, La. — Circle 105 on the Reader Service Card						
Dipper	Dredge	60.5 x 17.5 x 4.2	Commins	Dutra Construction		1996
(2) Global Industries	Lift Boat	40.7 x 24.1 x 4	Detroit Diesel	Global Industries		1996
(2) North Am	Supply Vessel	67.1 x 17.1 x 5.5	—	North American Shipbuilding		1996
(2) Unnamed	Decomposing Tug	37.8 x 11.3 x 5.7	EMD	Otto Condes		1996
Unnamed	Lift Boat	55.2 x 28 x 4.9	—	Halliburton		1996
Bremer Vulkan Werft, Bremen, Germany — Circle 106 on the Reader Service Card						
Costa Victoria	Cruise Liner	251 x 32.25 x 7.8	—	Costa Crociere SpA		7/96
Unnamed	BV 2700 C	192.5 x 32.25 x 11.3	—	NSB/Contship		8/96
Unnamed	BV 2700 C	192.5 x 32.5 x 11.3	—	NSB/Contship		10/96
Unnamed	BV 2700 C	192.5 x 32.6 x 11.3	—	NSB/Contship		12/96
Costa Olympia	Cruise Liner	258.57 x 32.25 x 7.8	—	Costa Crociere SpA		7/97
Chantiers de L'Atlantique, Saint-Nazaire, France — Circle 107 on the Reader Service Card						
B31 Splendour of the Seas	Cruise	221.5 x 32	—	Royal Caribbean Norway		3/96
B31 Napoleon Bonaparte	Cruise/Ferry	156 x 30.4 x 9.3	—	S.N.C.M. France		4/96
B30 Pateri Zamrud (Emerald Princess)	LNG	280 x 43.3	Kawasaki F.W.	Petronas Malaysia		Mid 1996
B31 Rhinopoly of the Seas	Cruise	234.7 x 32.2 x 7.6	—	Royal Caribbean Norway		4/97
B30 Pateri Finza (Turquoise Princess)	LNG	280 x 43.3	Kawasaki F.W.	Petronas Malaysia		Mid 1997
G31 Paul Gauguin	Cruise	134.1 x 21.4	—	Services & Transports France		10/97
F31 Vision of the Seas	Cruise	234.7 x 32.2 x 7.6	—	Royal Caribbean Norway		Mid 1998
Finnyards, Ltd., Rauma Finland — Circle 108 on the Reader Service Card						
No. 405	Fast Ferry	120 x 40 x 22	G.E.	Stena		1996
No. 407	Fast Ferry	120 x 40 x 22	G.E.	Stena		1997
Flender Werft AG, Lubock, Germany — Circle 109 on the Reader Service Card						
Yard No. 661, Santa Giovanna	Containership FW 2000 T	182.2 x 29.8 x 15.6	MAN-B&W 6 S 60 MC	Claus-Peter Offen		6/96
Yard No. 662, Santa Giuliana	Containership FW 2000 T	182.2 x 29.8 x 15.6	MAN-B&W 6 S 60 MC	Claus-Peter Offen		11/96
Yard No. 665	Containership FW 2000 T	182.2 x 29.8 x 15.6	MAN-B&W 6 S 60 MC	Claus-Peter Offen		4/97
Yard No. 666	Containership FW 2000 T	182.2 x 29.8 x 15.6	MAN-B&W 6 S 60 MC	Claus-Peter Offen		8/97
Yard No. 667	Containership FW 2000 T	182.2 x 29.8 x 15.6	MAN-B&W 6 S 60 MC	Claus-Peter Offen		12/97
Ingalls, Pascagoula, Miss. — Circle 110 on the Reader Service Card						
Cole	DDG 67	153.8 x 20.2 x 7.3	G.E.	U.S. Navy		1996
Milvus	DDG 69	153.8 x 20.2 x 7.3	G.E.	U.S. Navy		1996
Ross	DDG 71	153.8 x 20.2 x 7.3	G.E.	U.S. Navy		1997
Bataan	LHD 5	257.3 x 32.3 x 8.1	G.E.	U.S. Navy		1997
McFaul	DDG 74	153.8 x 20.2 x 7.3	G.E.	U.S. Navy		1998
Unnamed	DDG 78	153.8 x 20.2 x 7.3	G.E.	U.S. Navy		1998
Bon Homme Richard	LHD 6	257.3 x 32.3 x 8.1	G.E.	U.S. Navy		1998
Unnamed	DDG 80	155.3 x 20.2 x 7.7	G.E.	U.S. Navy		2000
Unnamed	DDG 82	155.3 x 20.2 x 7.7	G.E.	U.S. Navy		2000
Kreger Werft GmbH — Circle 111 on the Reader Service Card						
No. 1536	Container Vessel	97.25 x 16.9 x 7.55	—	Chinese		3/96
No. 1537	Container Vessel	97.25 x 16.9 x 7.55	—	Chinese		9/96
No. 1540	Container Vessel	97.25 x 16.9 x 7.55	—	German		10/96
Kvaerner Masa, Helsinki, Finland — Circle 125 on the Reader Service Card						
No. 1330	LNG Carrier	289 x 48.1	Steam Turbine	Abu Dhabi		1/96
No. 489	Cruise Liner	260.6 x 31.5	W.Sulzer	Carnival Cruise Lines		2/96
No. 1331	LNG Carrier	289 x 48.1	Steam Turbine	Abu Dhabi		6/96
No. 1337	Cruise Liner	21 x 193	Wartsila	Deutsche Seereederei Touristik		6/96
No. 492	Cruise Liner	279.1 x 32.2	MAN	Royal Caribbean Cruises		11/96
No. 1332	LNG Carrier	289 x 48.1	Steam Turbine	Abu Dhabi		1/97
No. 1333	LNG Carrier	289 x 48.1	Steam Turbine	Abu Dhabi		5/97
No. 1339	Floating Oil Storage Unit	229 x 41.5	Aux: MTU	Norsk Hydro		summer 97

(Continued on page 56)

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supplied three auxiliary engines, and there is a Leroy Somer 1,750-kVA shaft generator. The two trawlers have an identical package of Karmoy deck equipment comprising a type 3003 datatrawl system, trawl winches, top and midline winches, net drums, Tristar netwinch, fish pump and deck cranes.

The main quarries of owners **Brenden Gill** (*Brendelen*) and **Michael Cavanagh** (*Father McKee*) will be herring, scad and mackerel using the pair trawling system, which is preferred in the shallow, rocky waters around the vessels' home port of Killybegs, conditions which can cause problems operating trawl doors. Both vessels are, however, equipped for single boat trawling when the mackerel move into deeper water around January.

FBM latest — five TriCat order from Hong Kong

Rumors reported in these pages (*MR/EN* October 1995) that U.K. yard FBM Marine was awaiting confirmation of an order for three more of its 50-knot, highly stylized TriCat passenger ferries from Hong Kong based CTS-Parkview Ferries have turned out to be an understatement.

The deal, now confirmed, is actually for five new vessels, not three, and the contract — worth \$50 million — was signed in London on Monday, November 13th, with the first keel laid at FBM's shipyard at Cowes on the Isle of Wight the fol-

lowing day.

When delivered, this second batch of 318-seat, 148-ft. (45-m) vessels will bring the Parkview TriCat fleet up to 10. Of the five ordered initially, three are in service, one will be delivered shortly following the satisfactory completion of sea trials and the fifth is in the final stages of fit-out.

Innovative Dutch thruster

Holland Roerpropeller BV has developed a combined tunnel and retracting azimuthing thruster which has projected benefits for inland and coastal cargo vessels. A recent installation on a 164-ft. (50-m) fuel tanker operating out of Hull in North East England has, according to the skipper, speeded up operations quite significantly and made a vast improvement to the vessel's handling characteristics.

Rix Eagle, originally built by Hepworth Shipyard in 1990, had the new thruster added at the bow earlier this year at the same time as being lengthened by 20 ft. (6 m) and having a new high-velocity cargo venting system fitted. **Gus Northern** at the Hepworth yard, which also carried out the conversion work, is of the opinion that the vessel is now the most sophisticated tanker barge of her class in the U.K.

The new thruster unit is hydraulically driven and utilizes the vessel's existing hydraulic system driven off the 220-hp Cummins main engine. When lowered it provides 360-degree maneuverability,

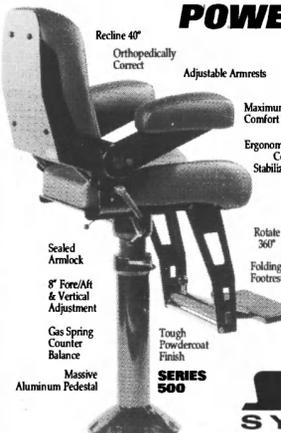


Rix Eagle incorporates a new combined tunnel and retracting azimuthing thruster developed by Holland Roerpropeller BV. The new thruster has projected benefits for inland and coastal cargo applications.

but in the retracted position, the Kort nozzle surrounding the propeller forms the center section of a conventional transverse thruster duct. This gives Skipper **Ken Emerson** the option in shallow water of operating the device as a normal bowthruster, especially fully laden. When extended, the thruster can also be used as a 4- to 5-knot emergency propulsion device.

Mr. Emerson, a tanker barge skipper on the River Humber for 38 years, is exceptionally enthusiastic about the conversion. "The addition of this thruster has been a tremendous success — the handling has improved out of all recognition and speeded up operations. To give one example, I no longer have to ballast the bow tank when empty just to submerge the tunnel thruster," he told *MR/EN*.

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USSCG 47 MB-19 Stidd Seats aboard
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WORLD ORDERBOOK STATISTICS

Yard Vessel Name	Type	Dimensions (LxWxD in m)	Engine	Owner	Price (US\$)	Delivery Date
No. 493	Cruise Liner	279.1 x 32.2	MAN	Royal Caribbean Cruises		9/97
No. 1322	Cable Ship	131.4 x 21.8	Wartsila	International Cableship		Fall 97
No. 491	Cruise Liner	260.6 x 31.5	Wartsila 12V38 Azipod Prop.	Carnival Cruise Lines		1998
No. 494	Cruise Liner	260.6 x 31.5	Wartsila 12V38 Azipod Prop.	Carnival Cruise Lines		1998
Lindencamp GmbH — Circle 112 on the Reader Service Card						
S 240	Oil Tanker	168 x 28 x 16.8	MAN	German		9/96
Marinette Marine, Marinette, Wis. — Circle 113 on the Reader Service Card						
Willow	Seagoing Buoy Tender	68.6 x 14 x 4	2 x Cat 3608 3100 bhp	USCG	27.2 M	1/30/97
Marcus Hanna	Coastal Buoy Tender	53.3 x 11 x 2.4	2 x Cat 3508 TA 1019 hp	USCG	12.4 M	2/26/97
Frank Schubert	Coastal Buoy Tender	53.3 x 11 x 2.4	2 x Cat 3508 TA 1019 hp	USCG	11.8 M	6/26/97
Kukui	Seagoing Buoy Tender	68.6 x 14 x 4	2 x Cat 3608 3100 bhp	USCG	25 M	8/14/97
Anthony Pettit	Coastal Buoy Tender	53.3 x 11 x 2.4	2 x Cat 3508 TA 1019 hp	USCG	11.6 M	10/24/97
McDermott Shipyard, Amelia, La. — Circle 114 on the Reader Service Card						
—	30,000 BBL Inland Tank Barge	96.3 x 16.5 x 3.7	—	L & I Oil Co.		12/95
—	(2) 30,000 BBL Inland Tank Barges	109.4 x 16.5 x 3.7	—	Canac Towing		12/95 - 2/95
—	(5) 30,000 BBL Inland Tank Barges	91 x 16.5 x 3.7	—	Canac Towing		1/196 - 5/1/96
—	(3) 25,000 BBL Ocean-Going Tank Barges	91 x 16.5 x 3.7	—	Canac Towing		4/96
Meyer Werft, Papenburg, Germany — Circle 115 on the Reader Service Card						
No. 642	Passenger Ship	146.5 x 23.4 x 5.9	—	Dept. of Comm. Indonesia		1996
No. 638	Cruise Vessel	259.7 x 32.2 x 7.7	—	Celebrity Cruises		1996
No. 643	Passenger Ship	146.5 x 23.4 x 5.9	—	Dept. of Comm. Indonesia		1997
No. 639	Cruise Vessel	259.7 x 32.2 x 7.7	—	Celebrity Cruises		1997
National Steel and Shipbuilding Company (NASSCO), San Diego, Calif. — Circle 116 on the Reader Service Card						
USS Shugart	T-ANKR 295	269.8 x 32.2 x 10.5	12 cyl. B&W	U.S. Navy		3/96
USS Yano	T-ANKR 297	269.8 x 32.2 x 10.5	12 cyl. B&W	U.S. Navy		8/96
USS Soderman	T-ANKR 299	269.8 x 32.2 x 10.5	12 cyl. B&W	U.S. Navy		12/96
USS Bridge	ADE 10	229.7 x 32.8 x 11.6	GE LM2500	U.S. Navy		10/97
Hull #451	T-ANKR 310	290 x 32.3 x 11.3	GE LM2500	U.S. Navy		3/98
Hull #452	T-ANKR 311	290 x 32.3 x 11.3	GE LM2500	U.S. Navy		10/98
Hull #453	T-ANKR 312	290 x 32.3 x 11.3	GE LM2500	U.S. Navy		4/99
Newport News, Newport News, Va. — Circle 117 on the Reader Service Card						
Ronald Reagan	Nimitz Carrier	—	—	U.S. Navy		1996
Cheyenne	LA-Class Sub	—	—	U.S. Navy		1996
Greenville	LA-Class Sub	—	—	U.S. Navy		1996
Makronissos	Product Tanker	—	MAN B&W	Eletson		1997
Agathonissos	Product Tanker	—	MAN B&W	Eletson		1997
Dhokos	Product Tanker	—	MAN B&W	Eletson		1998
Harry S. Truman	Nimitz Carrier	—	—	U.S. Navy		1998
Double Eagle Despotico	Product Tanker	—	MAN B&W	Eletson		1999
Odense Steel Shipyard Ltd., Odense C., Denmark — Circle 118 on the Reader Service Card						
L 154	Container Vessel	—	—	A.P. Moller		1996
L 155	Container Vessel	—	—	A.P. Moller		1996
L 156	Container Vessel	—	—	A.P. Moller		1996
L 157	Container Vessel	—	—	A.P. Moller		1996
L 158	Container Vessel	—	—	A.P. Moller		1997
L 159	Container Vessel	—	—	A.P. Moller		1997
L 160	Container Vessel	—	—	A.P. Moller		1997
L 161	Container Vessel	—	—	A.P. Moller		1997
L 162	Container Vessel	—	—	A.P. Moller		1997
Schichau Seebeckwerft AG, Bremerhaven, Germany — Circle 119 on the Reader Service Card						
T 8.A	Passenger Ferry	185 x 28.2 x 14.4	Man B&W	DFG		12/96
Stocznia Odanska SA, Odansk, Poland — Circle 120 on the Reader Service Card						
No. 8683/2	Bulk Carrier	199.4 x 30.8 x 17	—	The East Asiatic Company Ltd. A/S		1/96
No. 8508/31, Pierre Dour	Reefer	138.1 x 21.5 x 13.2	—	Lorient Maritime S.A.		2/96
No. 8684/1	Bulk Carrier	190 x 31 x 18.5	—	Gearbalk Holding Ltd.		3/96
No. 8684/2	Bulk Carrier	190 x 31 x 18.5	—	Gearbalk Holding Ltd.		4/96
No. 8683/3	Bulk Carrier	199.9 x 30.8 x 17	—	Wavelength Shipping Corp.		5/96
No. 8508/32	Reefer	138.1 x 21.5 x 13.2	—	Quimper Maritime S.A.		5/96
No. 8191/3	Containership	175 x 26.5 x 14.2	—	Schoeller Holdings Ltd.		8/96
No. 8683/4	Bulk Carrier	199.9 x 30.8 x 17	—	Wavelength Shipping Corp.		9/96
No. 8684/3	Bulk Carrier	190 x 31 x 18.5	—	Gearbalk Holding Ltd.		9/96
No. 8191/4	Containership	175 x 26.5 x 14.2	—	Schoeller Holding Ltd.		11/96
No. 8684/4	Bulk Carrier	190 x 31 x 18.5	—	Gearbalk Holding Ltd.		1/97
No. 8191/5	Container	175 x 26.5 x 14.2	—	Schoeller Holdings Ltd.		2/97
No. 8191/6	Container	175 x 26.5 x 14.2	—	Schoeller Holdings Ltd.		6/97
No. 8173/1	Container	241.6 x 32.24 x 19.1	—	Sapfo Navigation		6/97
No. 8683/5	Bulk Carrier	199.9 x 30.8 x 17	—	Algoma International		7/97
No. 8191/12	Container	175 x 26.5 x 14.2	—	Schoeller Holdings Ltd.		12/97
No. 8173/2	Container	241.6 x 32.24 x 19.1	—	Lito Navigation Inc.		1/98
3. Maj, Rijeka, Croatia — Circle 121 on the Reader Service Card						
No. 671	Oil/Product Tanker	173.8 x 32 x 17	3 Maj-Sulzer	Novorossiysk Shipping	30.6 M	6/96
Jadrolov Pride	Container Vessel	201.4 x 32.2 x 18.7	3 Maj-Sulzer	Scargo Maritime Inc.	37 M	8/96
No. 671	Oil/Product Tanker	173.8 x 32 x 17	3 Maj-Sulzer	Novorossiysk Shipping	30.6 M	9/96
No. 667	Multi-Purpose Vessel	169.8 x 27.5 x 13.8	3 Maj-Sulzer	Chipolbrok	27 M	6/97
No. 668	Multi-Purpose Vessel	169.8 x 27.5 x 13.8	3 Maj-Sulzer	Chipolbrok	27 M	12/97
Tregir, Tregir, Croatia — Circle 122 on the Reader Service Card						

WORLD ORDERBOOK STATISTICS

Yard Vessel Name	Type	Dimensions (LxWxD in m)	Engine	Owner	Price (US\$)	Delivery Date
Taganrog	Oil/Chemical Tanker	181 x 32 x 10	8310 kW@123 rpm	Novorosysk Shipping		1/96
No. 219	Oil/Chemical Tanker	181 x 32 x 10	8310 kW@123 rpm	Novorosysk Shipping		7/96
No. 220	Oil/Chemical Tanker	181 x 32 x 10	8310 kW@123 rpm	Novorosysk Shipping		12/96
U.S. Boat Yards						
Atlantic Marine, Jacksonville, Fla. — Circle 126 on the Reader Service Card						
Trump Princess	Passenger Ferry	51.2 x 19.5	(2) Detroit Diesel 12V149Ti	Trump Indiana		4/96
Freeport Shipbuilding & Marine Repair, Inc., Freeport, Fla. — Circle 127 on the Reader Service Card						
Unnamed	Private Charter	20.4 x 6.1	Cummins	Chesapeake Marine Tours, Inc.		3/96
Unnamed	Motor Tender	15.2 x 5.5	Caterpillar	U.S. Army Corps of Engineers		5/96
Gladding-Hearn, Somerset, Mass. — Circle 128 on the Reader Service Card						
Unnamed	Ferry	26.8	—	Soyville Ferries		5/96
Friendship V	Whalewatch	33.5	—	Bar Harbor Whale Watch Co.		5/96
Virginia Pilot	Pilot	15.8 x 1.5	700 hp	Virginia Pilots Assoc.		8/96
XP-300	Ferry	19.8	—	Duclos Corp.		TBD
Leovac, Jennings, La. — Circle 129 on the Reader Service Card						

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WORLD ORDERBOOK STATISTICS

Yard Vessel Name	Type	Dimensions (LxWxD in m)	Engine	Owner	Price (US\$)	Delivery Date
Unnamed	Reverse Tug	30.5 x 11.6 x 5.5	EMD 16-645-E2	American Tug, Inc.		4/96
Unnamed	Reverse Tug	30.5 x 11.6 x 5.5	EMD 16-645-E2	American Tug, Inc.		10/96
Unnamed	Reverse Tug	33.5 x 12.2 x 5.8	Wartsila	River/Ocean Systems, Inc.		12/96
Unnamed	Ocean Cargo Barge	118.9 x 19.8 x 7.9	—	River/Ocean Systems, Inc.		12/96
Unnamed	Reverse Tug	30.5 x 11.6 x 5.5	EMD 16-645-E2	American Tug, Inc.		4/97
Unnamed	Reverse Tug	30.5 x 11.6 x 5.5	EMD 16-645-E2	American Tug, Inc.		10/97
Orange Shipbuilding, Orange, Texas — Circle 123 on the Reader Service Card						
Calink9607	Fuel Barge	59.4 x 10.7 x 3.7	G.M.	U.S. Army Corps of Engineers	1 M	7/96
Mr. Pat	Towboat	25.3 x 10.4 x 3.1	CAT	U.S. Army Corps of Engineers	2.5 M	8/96
22-YCs	Deck Barges	33.5 x 9.8 x 2.7	—	U.S. Navy	8 M	12/96
6-LS QCs	N/A	45.7 x 9.8 x 5.8	—	N/A		12/96
Service Marine Industries, Inc., Morgan City, La. — Circle 124 on the Reader Service Card						
Mary's Prince	Casino	77.4 x 23.8	CAT	Boyd Gaming		1/96
Unnamed	Casino Barge	107 x 29.4	—	Unnamed		3/96
Unnamed	Product Barge	54.9 x 16.5	—	Unnamed		5/96

U.S. YARDS: DON'T MISS THE FEEDER SHIP BOOM

U.S. shipyards are especially suited to build 800- to 1,500-TEU feeder containerships, and should investigate this market as it is about to expand rapidly, said **Guy Morel**, president, MC Shipping. Mr. Morel believes U.S. yards have the technical know-how, the facilities, the financing and the low labor rates to gain a sizable chunk of what he deems an expanding market.

Marine industry consultant **James R. McCaul**, president, IMA Associates (Washington, D.C.) concurs that more growth is to come in the containership market segment, driven by the high quantity of very large containerships currently on order around the world. This, combined with the emergence of mega hubs, will

advance the hub and spoke trend significantly, creating a demand for feeder ships. Mr. Morel was in New York in November to deliver the company's positive financial news, and took time to discuss his views on the market with *MR/EN*. MC Shipping, based in Monaco, owns, operates and charters ocean-going dry cargo vessels, and is the only U.S. exchange-listed feeder containership specialist. Its fleet consists of four feeder containerships, five multi-purpose carriers and one bulk carrier, which range in size from 14,401 to 23,991 dwt.

While Mr. Morel discussed many matters of interest, the talk kept falling back to the containership market, particularly how moves by the big liner companies to consolidate will help expand the

feeder business tremendously in the coming years. "The consolidation (of the big liner companies) is excellent, and it will rationalize this industry and create new opportunities in our area," he said. Specifically, he sees the consolidation as solidifying the main east-west arteries, and creating many new spoke lines — opportunities for feeder ship owners — on north-south routes. Mr. Morel said the company is currently evaluating its fleet, the market and its strategy to sell and buy ships to provide optimum service for its customers, the large containership lines. While his immediate focus is transfixed on good, fast, secondhand ships, he said the company is investigating the newbuild market, and he has seen from yards

around the world several designs of interest. MC Shipping is structured as a next-generation shipowner, and has been profitable of late. In New York the company announced a tripling of net income for the first nine months of 1995, and a substantial increase for the third quarter of 1995 from break-even the previous year. It also reported a 40 percent increase in the quarterly dividend. Mr. Morel noted that the *MC Pearl*, which sustained minor damage en route to Dubai, is now undergoing repairs in that port, under the supervision of the charterer. Under the existing bareboat charter contract, the charterer has full responsibility for all costs of repairs and charges associated with time out of service.



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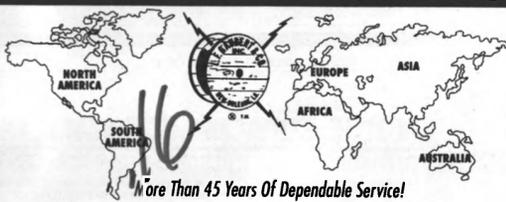
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DIESEL ENGINE - Spare Parts & Repair

Alaska Diesel 4420 14th Ave. NW, Seattle, WA 98107
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610
Cummins Engine Co., 4200 Leids Ave., Ste. 301, Charleston, SC 29405-8211
Cummins Mid-South, Inc., 110 E. Arline Highway, Kenner, LA 70062
John Deere, John Deere Rd., Moline, IL 61255
D/W Noreborg Co., P.O. Box 2100, Norfolk, VA 23501-2100
Gottens Worldwide, 160 Van Bunt St., Brooklyn, NY 11231
Hatch & Kirk Inc., 601 McFarland Rd., Houston, TX 77011-1129
In-Place Machining Co., Inc., 1929 North Bufum Street, Milwaukee, WI 53212-3793
Kiene Diesel, 325 S. Fairbanks, Addison, IL 60101
Kaltenberg Marine, 17 Grandview Ave., W. Orange, NJ 07052
MAN B&W Diesel AG, Sudschiffstrasse 1, D-98153 Augsburg, GERMANY
MAN B&W Diesel AS, Tegholmgade 41, DK-2450 Copenhagen SV, DENMARK
MAN B&W Diesel, 17 State St., New York, NY 10004
Motor-Service AB, Box 2115, S-144 04 Roninge, SWEDEN
Motor-Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315
Not-Tech, Inc., 100 Wall St., New York, NY 10005
Panman Diesels, P.O. Box 8, Panman Works, Colchester, Essex, CO1 2HW, ENGLAND
Panman Diesels USA, (A Div. of Roston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77064
Utevin Bergen AS, PO Box 924, N5002 Bergen, NORWAY
Wärtsilä Diesel, 201 Delaware Highway, Annapolis, MD 21401

DIVING & SALVAGE

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
H.J. Membrue, P.O. Box 2123, New Orleans, LA 70183
Mullion Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOORS - MARINE & INDUSTRIAL

Branton Ind., 1101 Edwards Ave., Jefferson, LA 70161
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123

DRY DOCKS-Design

Mapeco Walt & Krenzer, Inc., 90 Forest Ave., Loust Valley, NY 11560
Marine Accommodations, 8535-S Baymeadows Rd., Jacksonville, FL 32256

DUCTORS

Veh-Monitor, 566 Parker St., Newark, NJ 07104

ELECTRICAL ENCLOSURES

Science Applications International Corp., 3990 Old Town Ave., Ste 303C, San Diego, CA 92121

ELECTRICAL EQUIPMENT

L. F. Gaudet & Co., Inc., P.O. Box 50500, New Orleans LA 70150
MMC International, 60 Inip Dr., Inwood NY 11696

ELECTRICAL WIRE DEVICES

Metric Corp., 1835 Ace World Wide Lane, Cadbury, WI 53110

ELECTRONIC DISPLAY

Kocum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY

ELECTRONIC INFORMATION SUPPORT

Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY

EMISSION CONTROL

EMPLOYMENT

Boat Crews, 1 Seine Court, Suite 309, New Orleans, LA 70114
Marine Jobs, Inc., 800 Downtown Blvd. Ste. 111, Mobile, AL 36609

ENGINEERING SERVICES

Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

ENGINE ROOM LIGHTING

Pauluhn Electric Mfg. Co., Inc., 1616 N. Main, P.O. Box 53, Pearland, TX 77581

ENGINE TEST EQUIPMENT

General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Rd., Plymouth, MA 02360

ENVIRONMENTAL SYSTEMS

Foss Environmental Services, 7440 West Marginal Way So., Seattle, WA 98106-4141

EPIBBS

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale, FL 33310-5247

EVAPORATORS

Alden Electronics, 40 Washington St., Westborough, MA 01581

EXHAUST SYSTEMS

Beaird Industries Inc., P.O. Box 31115, Shreveport, LA 71130

FANS - VENTILATORS - BLOWERS

Ion M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS

American Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Oakbe Co., Inc., 645 Forest Edge Drive, Vernon Hills, IL 60061-3106

FENDERING SYSTEMS/BUOYS - Dock & Vessel

B.F. Goodrich, 150 Division Drive, Wilmington, NC 28401
Kaltenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

FENDERING SYSTEMS/BUOYS - Dock & Vessel

Schuyler Mfg. Co., Inc., 16901 Woodville-Radmond Rd., Woodville, VA 98072

FIBERS

Ultra Poly Inc., 2928 South Steele, Tacoma, WA 98409
Wing Fender Co., 1160 State St., Penn Amboy, NJ 08861

FINANCIAL SERVICES

Allied Signal, Meyer I Box, 101 Columbia Rd., Morristown, NJ 07962

FINANCIAL SERVICES

Enterprise Inc., 500 N. Blackhawk Dr., Westmont, IL 60559
Luber-Finer, Inc., 5050 Quorum Drive, Dallas, TX 75240

FIN STABILIZERS

U.S.A. Repts. Simplex-Turnar Inc., P.O. Box 168, Little Neck, NY 11363-0168

FIRE RESISTANT PANELS

Autronica Marine AS, Drammensveien 126, N-0277 Oslo 2, NORWAY

FIRE RESISTANT PANELS

Thermax N.A., 13115 Dulany Valley Rd., Glen Am, Baltimore, MD 21057

FIRE SUPPRESSION AGENT

Autronica Marine AS, Drammensveien 126, N-0277 Oslo 2, NORWAY

FIRE SUPPRESSION AGENT

American Vulkan, P.O. Drawer 673, Writter Haven, FL 33882

FIRE SUPPRESSION AGENT

Buy-O-Systems, 3003 West Carson St., Pittsburgh, PA 15204

FIRE SUPPRESSION AGENT

Sea-Systems, 3710 Howard Hughes Pkwy., Las Vegas, NV 89109

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Sea-Systems, 3710 Howard Hughes Pkwy., Las Vegas, NV 89109

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FIRE SUPPRESSION AGENT

Sea-Systems, 3710 Howard Hughes Pkwy., Las Vegas, NV 89109

FIRE SUPPRESSION AGENT

Sea-Systems, 371

ACR Electronics, Inc. 5757 Ravenwood Rd., Ft. Lauderdale, FL 33310-5247
Archway Marine, 4501 Swan Ave., St. Louis, MO 63110
Bates Inc., P.O. Box 1150, Kinder, LA 70648
Blamox, 44 Austin Street, P.O. Box 13522, St. John's, N. CANADA A1B 4B8
Gohm Marine, 160 Van Buren St., Brooklyn, NY 11231
Kodum Soons, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Paukhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
Francis Sauerhagel's Supply Co., 4415 6th N.W., Seattle, WA 98107

LIQUID LEVEL GAUGES
Eugene Ernst Products Co., 116 Main St., Farmingdale, N.J. 07727
King Engineering Corp., P.O. Box 1228, Ann Arbor, MI 48106

LIQUID LEVEL INDICATORS
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie, IL 60076-0226
LIQUID OVERFILL PROTECTION SYSTEMS
E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026
Metrape, Inc., 59 Porter Rd., Littleton, CO 80160
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie, IL 60076-0226

LOGISTICS
Newport News Shipbuilding, Logistics & Technical Services, 12129 Jefferson Ave., Newport News, VA 23603
GED, 4646 N. W. Hitchcock Road, Virginia Beach, VA 23455
N. Logistics Consultants, Inc., 3420 Bernville Blvd., Ocean Springs, MS 39564

LUBRICANTS
Royal Lubricants, P.O. Box 518, East Hanover, NJ 07936
Ipsco, International, 2000 Westchester Avenue, White Plains, NY 10650

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavo, 619 Industrial Rd., Carlstadt, NJ 07072
Gohm Marine Company Inc., 160 Van Buren Street, Brooklyn, NY 11231
New England Trailer Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

MACHINERY MONITOR AND CONTROL SYSTEMS
Electronic Marine Sales, P.O. Box 107055

MARINE ACCOMMODATIONS
Directions in Design Inc., 11457 Old Cabin Rd., Ste. 100, St. Louis, MO 63141
Hopeman Brothers, Inc., P.O. Box 821, 435 Gates St., Weymouth, VA 22980
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33401
Marine Accommodations, 855-3 Baymeadows Rd., Jacksonville, FL 32256
Marine Services Corp., 3457 Guilford Dr., Hood River, OR 97031

MARINE CEILING
Hydro-Aluminum, Via Verk, N-5880 VIKI SOGN, Norway

MARINE DECKING
Hopeman Brothers, Inc., P.O. Box 820, Weymouth, VA 22980
Hobby, P.O. Box 1650, Seaside, CA 94067

MARINE ELECTRONICS
Frank L. Beier Radio, 2001 Ridgeway Drive, Metairie, LA 70001
Kodum Soons, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Sabb Marine Electronics AB, Box 13045, 402 S1 Göteborg, SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

MARINE ELEVATORS
Alimak Elevator Co., 1100 Boston Ave., Bridgeport, CT 06601
McElroy Machine, 1101 Loraine Rd., Bloom, MI 39535-4454

MARINE EQUIPMENT
Bohnert & Associates, 1150 Rue Rochelle, Sidel, VA 70458
EDE Trading AS, P.O. Box 130540, Norfolk, VA 23514
McElroy Machine, P.O. Box 4454, Bloom, MS 39535-4454

MARINE FINANCING
Hiller Systems, 3710 Lakeside Court, Mobile, AL 36683
Honor Ship Services Inc., 2375 West Esther Street, Long Beach, CA 90813

MARINE FURNITURE
Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave Boca Raton, FL 33401
Marine Services Corp., 3457 Guilford Dr., Hood River, OR 97031

MARINE GEARS
Chromat Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
The Falk Corp., P.O. Box 492, Milwaukee, WI 53201-0492
Haley Marine Gears, Inc. P.O. Box 689, Greenville, MS 38702
Marine Gears, P.O. Box 689, Greenville, MS 38702
Wedtech Gear Corp., 2800 East Imperial Hwy., Lynwood, CA 90282
ZF Industries Inc., 777 Hickory Hill Drive, Vernon Hills, IL 60061

MARINE HYDRAULICS
Del Gavo Marine, 615 Industrial Rd., Carlstadt, NJ 07072

MARINE INSURANCE
John G. Aiken, 1200 SE 77th St., Fort Lauderdale, FL 33316

MARINE INTERIORS
Jamestown Metal Marine Sales, 4710 Northwest Second Ave., Boca Raton, FL 33401
Johnson Construction Specialties, Inc., 3420 Rusk P.O. Box 190, Houston, Texas 77251
Maritime Services Corp., 3457 Guilford Drive, Hood River, OR 97031

MARINE LADDERS
Sea Systems, Inc., 75 Avco Rd., Ward Hill, MA 01835

MARINE PLUMBING
Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21111

MARINE PUMPS
Giles Inc., P.O. Box 828, Seabrook, TX 77586

MARINE SURPLUS SALES
Defense Reutilization & Marketing Service, 2163 Airways Blvd., Memphis, TN 38114

MULTI-CABLE PENETRATION DEVICE
NMP, 12427 E. 60th St., Tulsa, OK 74153

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Engineers, Inc., 1225 Atlantic Ave., Arlington, VA 22202
Donald L. Blount, 2550 Elmore Ave., Ste. K, Norfolk, VA 23513
C. Barber & Associates, P.O. Box 9006, Mobile, AL 36609
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Childs Engineering Corp., Box 333, Medfield, MA 02052
Candell Dry Dock Engrs., Inc., 21 Pottery Ln., Doutham, MA 02026
Crane Consultants, 15301 First Ave. S., Seattle, WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
CT Marine, 36 Crooked Trail, Rowayton, CT 06853
Arthur D. Gartin, 3200 Ridgeway Dr., Suite 403, Metairie, LA 70002
DeJong & Label, Inc., 1734 Emerson Street, Jacksonville, FL 32207
Design Associates Inc., 14360 Chief Minister Highway, New Orleans, LA 70129
Designers & Planners, 2120 Washington Blvd., Ste. 203, Arlington, VA 22204
Diversified Technologies, 812 Live Oak Dr., Chesapeake, VA 23320
Eliot Bay Design Group 5301 Shilohdale Rd., Suite 200, Seattle, WA 98107
Ernst Mgmt & Engineering Consultant Services, P.O. Box 780, Beaumont, TX 77706
Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010
John W. Gilbert & Assoc., Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Assoc., Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Guido Perin & Assoc., 700 3rd Ave., Ste. 1210, Seattle, WA 98104
Morris Guarinick Associates, Inc., 130 Sutter St., Ste. 400, San Francisco, CA 94104
C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
Hydrocorp, Inc., 291 C. P. Packer Court, Williamsburg, VA 23185
J.H. Inc., 3412 Progress Dr., Bensalem, PA 19020
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
James S. Kroger, 799 Brickell Plaza Ste. 701, Miami, FL 33131
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
MCA Engineers, Inc., 2960 Anway Ave., #A-103, Costa Mesa, CA 92626
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Bloom, MS 39535-4454
John J. McKelton Associates, Inc., 1 World Trade Cr., Ste. 3000, N. W. 10408
Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401
Marine Design & Operations, Inc., 226 Chestnut St., Hostile Park, NJ 07204
Marine Management Systems Inc., 102 Hamilton Ave., Stamford, CT 06902
Marine Power Associates, 1010 Turquoise St., Ste 217, San Diego, CA 92109
Maribach, Seacraft, Bay Head, Newmarket, NH 03857
Maritime Design, Inc., 3520 Harley Rd., Jacksonville, FL 32257
R.J. Mellus & Co., 71 Hudson St., New York, NY 10013
Nautical Design, Inc., 2101 S. Andrews Ave., Suite 202, Ft. Lauderdale, FL 33316
Ocean Motors Co., P.O. Box 130, 49 Shore Drive, Barrington, RI 02806-0130
Ocean Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777
QED Systems Inc., 4646 W. Hitchcock Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Fulton St., Ste. 301, San Francisco, CA 94107
Sargent & Henkes, 255 Baronne St., Suite 1405, New Orleans, LA 70112
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
Sea School, 10612 Gandy Boulevard, St. Petersburg, FL 33702
Seaworthy Systems Inc., P.O. Box 963, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 975, Bamegat Light, NJ 08006; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041.

50 Vashell Way, Orinda, CA 94563
George G. Sharp, Inc., 100 Church St., New York, NY 10007
R.A. Siam, Inc., 253 N. 14 Ave., Sturgeon Bay, WI 54225
A.K. Suda & Ass., 3004 19th St., Merarie, LA 70002-4989
TMSCO, P.O. Box 91360, Mobile, AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT
Autonica Marine AS, Drammensveien 126, N-0277 Oslo 2, NORWAY
Colnet Corp., 400 Main St., Stamford, CT 06901-3004
Consat Maritime Services, 891 E. Grand Plaza SW, Washington DC 20024
Crusephone, 2100 Park Central N., Pompano Beach, FL 33064
Electronic Marine Systems, 900 Ferriside Pl., Rahway, NJ 07065
Furuto U.S.A., 271 Harbor Way, S. San Francisco, CA 94090
Hose-McCann, 1241 W. Newport Center Dr., Deerfield Beach, FL 33442
ICS Electronics Ltd., Unit V, Rufford Industrial Estate, Ford, Attercliff, West Essex, UK
Scandinavian Micro Systems P.O. Box 155, N-4111, Koblenz, NORWAY
Scientific Atlanta, Inc., 1650 International Court, Norcross, GA 30093
Sea, Inc., 7020 220th S.W., Mountlake Terrace, WA 98043
Simrad, 12910 32nd Avenue West, Lynnwood, WA 98036
Simrad Robertson, 18001 Hammony, Suite 100, Houston, TX 77043-1923
Sperry Marine Inc., 1070 Siminole Trail, Charlottesville, VA 22901
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Starlink, Inc., 6400 Highway 290 East, Suite 202, Austin, TX 78752
Trimble Navigation, 565 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waylure Communications System, Inc., 453 E. Park Pl., Jeffersonville, IN 47130

NOZZLE SYSTEM
Alfa Romeo, Via S. Ercolano 488, Maszath, MEXICO 82180

OIL—Marine—Additives
Mobil Oil Corporation, 5225 Galows Road, Fairfax, VA 22031-0001
U.S.A. Repp Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168

OIL SPILL CONTAINMENT
Gross Environmental, 7440 W. Marginal Way S., Seattle, WA 98108-4141

OUTRIGGER SEPARATORS
Alfa-Laval Separation, Inc., 955 Meams Rd., Warrinester, PA 18974-0556
Bohm & Voss AG, P.O. Box 10 07 20, D-20457 Hamburg, I, GERMANY
U.S.A. Repp Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168
Fast Systems, 3840 North Broadway, St. Louis, MO 63147
MMC International, 60 Hip Dr., Inwood, NY 11696
National Fluid Separators, 627 Harley Industrial Ct., St. Louis, MO 63144
Nelson Industries, Highway 51 West, Slough, Wilt, Shropshire, UK
Nelson Industries, Highway 51 West, Slough, Wilt, Shropshire, UK
Ashland Chemical Co., Drew Marine Co., One Drew Plaza, Boonton, NJ 07005
Corrosal, Inc., 1045 12th Ave. NW-FSA, Issaquah, WA 98027
Devoe Coatings, 4000 Dupont Circle, Fairfax, VA 22031
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502
Ferro Corp., 1301 North Flora St., Plymouth, IN 46563
Jamestown Metals, 28 Naragansett Ave., P.O. Box 348, Jamestown, RI 02835
Hempel Controls, 6901 Cavalcade St., Houston, TX 77028
International Zinc, 450 Seventh Ave., New York, NY 10123
Microphor, Inc., Marine Div., 452 E. Hill Rd., P.O. Box 1460, Wilks, CA 95490
Permaplast Rust, 264 South Main St., Wallingford, CT 06492
Product Research Service, Inc., 229 Hwy 23, P.O. Box 159, Brea, CA 92615
Royal Chemical, 2705 Concord Road, Belle Chasse, LA 70007
Sigma Coatings, 8979 Market St., Houston, TX 77029, 330 Rover Rd., Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030
Unitor Ship Services Inc., 2375 West Esther Street, Long Beach, CA 90813

PIPE FITTING/CUTTING/CONNECTING SYSTEMS
Robert Fischer Pipe, P.O. Box 407, Hayslet, NY 11741, MI 48442
Lokring Corp., 396 Hatch Drive, Foster City, CA 94404

PLATING EQUIPMENT
The Falk Corp., P.O. Box 492, Milwaukee, WI 53201-0492

POLLUTION CONTROL PRODUCTS/MARINE SERVICES
Foss Environmental, 7440 W. Marginal Way S., Seattle, WA 98108-4141
Tetra Tech, 2300 West Commodore Ave., Chicago, IL 60619
Oil Mop, Inc., 221 Rue De Jean, Lafayette, LA 70508

PREDICENTS
Crimet, P.O. Box 253, Monroe, CT 06468

PREDICTIVE MAINTENANCE
Predicent, 25 Winslow Way West, Barabrage Island, WA 98110

PROPELLERS
Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna - SWITZERLAND
Rolla SP Propellers USA, 4030 Mustang Road, Midland, TX 79704
Sun Propeller, 1608 Fairview Avenue E., Seattle, WA 98102

PROPULSION EQUIPMENT
—Dewhurst's Diesel Engines, Propellers, Shafts, Turbines
Avondale Industries, Harvey Quick Repair, P.O. Box 116, Harvey, LA 70058
American Air Filter, P.O. Box 35680, Louisville, KY 40432
Kobelt Manufacturing, 11702 Horseshoe Way, Richmond, BC, Canada V7A 4V5
ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND
ABB TURBOCHARGER, Inc., 1460 Livingston Avenue, Newark, NJ 09802
Aquamaster-Ruama Ltd., P.O. Box 126, Pasagulue, MI 48069
Aquamaster-Ruama Inc., 2315 North Woodlawn Ave., Ste. 103, Metairie, LA 70001
Rolla Johnson Company, P.O. Box 126, Pasagulue, MI 48069
Burnhill AS, P.O. Box 370, N-8401, Molde, Norway
Caterpillar, 100 NE Adams Street, Florida, IL 61629-2320
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
The Falk Corp., P.O. Box 492, Milwaukee, WI 53201-0492
Fincantieri, Diesel Engines Div.—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fairburg, MA 01420
Gohm's Marine Company, 160 VanBuren St., Brooklyn, NY 11231
Hobart Engineering, Inc., 1300 Kemper Meadow, Ste. 500, Cincinnati, OH 45240
In-Place Machining Co., Inc., 1929 North Buffum Street, Milwaukee, WI 53212-3793
Kahlerberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp Mak, 7555 Danboro Crescent, Mississauga, Ontario, CANADA L5N 6P9
Kobelt Manufacturing, 11702 Horseshoe Way, Richmond, BC, Canada V7A 4V5
LIPS B.V., P.O. Box 6, 5151 RP Drunen, The Netherlands
LIPS U.S.A., Inc., 3817 Koppers Way, Chesapeake, VA 23323
Lohmann & Stolterhoff, P.O. Box 1860, D-58408 Witten, Germany
Lo-Rex Vibration Control, 186 West 8th Ave., Vancouver, BC CANADA, V5Y 1N2
Maspor Products Inc., 90 Forest Ave., Luzon Valley, N.Y., 11750
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, U.S. Division, P.O. Box 1442, Halver GERMANY
MAN B&W Diesel AS, Alpha Diesel, Niska Juvä Vg 15, DK-9000
Friedrichshafen, DENMARK
MAN B&W Diesel GmbH, Stadtachthustrasse 1, D-86153 Augsburg I, GERMANY
North American Marine Jet, P.O. Box 1232, Benton, AR 72015
Omnitruator, Inc., 3515 Soranman Ave., Santa Fe Springs, CA 90670
Orion Corp., 111 Cedar Creek Rd., Griffin, WI 53024
Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND
Rolla SP Propellers USA, 4030 Mustang Road, Midland, TX 79704
Karl Senner Inc., 25 W Third, Kenner, LA 70062
Schottel-Werft, Manizer Strasse 59, D-56322 Spay/Rhein, GERMANY
Schottel North America, Inc., 1595 Corbin Ave., Hammond, LA 70403
Siemens Electric Ltd., 1180 Countywaypaik Rd., Mississauga, ONTARIO
Stewart & Stevenson, 1400 Deshler, P.O. Box 8, Haney, LA 70059-0008
Uelsen Bergen Diesel AS, P.O. Box 824, N-9002, Bergen, NORWAY
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 11020
Oy Wärtsilä Ab, Vasa and Abo Divisions, P.O. Box 244, SF-05100 Vasa, FINLAND
—Buckley's Diesel Engines, Propellers, Shafts, Turbines
Beckson, P.O. Box 3336, Bridgeport, CT 06605

PUMP—Repair—Drives
Del Gavo, 619 Industrial Rd., Carlstadt, NJ 07072
Giles, Inc., P.O. Box 828, Seabrook, TX 77586
Jim's Pump Repair, 48-65 38th St., Long Island City NY 11101
Jerry B. Leach, P.O. Box 71, 847 State Rd., Chesney, SC 29520
Leitzig Corporation, 165 Chestnut Street, Alton, NJ 07401
Via Motorator, 566 Palmer St., Newark, NJ 07104

REFRIGERATION EQUIPMENT/SERVICES
Adrick Marine, 141D, Central Ave., Farmingdale, NY 11735
Ashland Chemical Co., Drew Marine Co., One Drew Plaza, Boonton, NJ 07005
RTF Mfg., RD #1 Route 66, Hudson, NY 12534
Unitor Ship Service, Inc., 2375 West Esther Street, Long Beach, CA 90813

REMOTE VAPOR LINE

American United Marine Corp., 5 Broadway, RI 1, Saugus, MA 01906
Eliott Manufacturing, P.O. Box 773, Binghamton, NY 13902
Velleis, Inc., 771 First Ave., King of Prussia, PA 19406

RIGID INFLATABLE BOATS
American Eagle, 780 E. Paste Jensen Way, LaComer, WA 98257
Willard Marine, Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of N. America Thompson Creek, P.O. Box 400, Stevensville, MD 21666

ROPE—Manila—Nylon—Haweser—Fibres
Allied Signal Inc., Fibers Division, 101 Columbia Rd., Morristown, NJ 07962
American Mfg. Co., 200 Southpark Rd., Lafayette, LA 70508-3609

RUBBER BUSHES
Vesco Plastics, P.O. Box 40647, Cleveland 2022, South Africa

RUST CONVERTERS
Colsonal, Inc., 1046 12th Ave. NW #F5A, Issaquah, WA 98027

SAVED/DEPILL RESPONSE
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Eliach International Corp., 1110 Industrial Blvd., Sugarland, TX 77478
Envirowac, Inc., 1260 Tunnel Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, MO 63027
Microphor, Inc., 452 E. Hill Rd., P.O. Box 1460, Wilks, CA 95490
Research Products Blankenship, 2639 Ardgen Dallas, TX 75220

SAFETY LIGHTING
Dalex, Inc., P.O. Box 1150, Kinder, LA 70648-1150
Donjon Marine, 1250 Liberty Ave., Hillsdale, NJ 07025

SANITATION DEVICE—Pollution Control
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Eliach International Corp., 1110 Industrial Blvd., Sugarland, TX 77478
Envirowac, Inc., 1260 Tunnel Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, MO 63027
Microphor, Inc., 452 E. Hill Rd., P.O. Box 1460, Wilks, CA 95490
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Norwegian Telecom, Postboks 2701 S., Olvs Plaza, N-0130, Oslo, Norway
PTT Telecom, Station 12, P.O. Box 30150-2500 JD The Hague, NETHERLANDS
Telecel Atlanta, Inc., 1650 International Court, Norcross, GA 30093
Telecom Telestar, 15 Hill Street, Telephone House, 2nd Storey, Singapore 0617
Telstar Mobile Satellite & Radio Services, 79 St. Hillers Rd., Auburn NSW 2144, AUSTRALIA

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Sea Containers Orders Six High-Speed Ferries From Fincantieri For \$200 M

Sea Containers Ltd. has ordered six monohull high speed car ferries from Fincantieri Cantieri Navali Italiana SpA. The ships will be built at Fincantieri's Riva Trigoso yard. Two of the ships will be delivered in early 1997, two in early 1998 and two in late 1998. The vessels will be 330 ft. (100 m) long and be able to carry 800 passengers and 175 cars. Powered by a propulsion system including Ruston diesel engines and KaMeWa steering waterjets, the vessel will achieve, under full load, a speed of not less than 37.8 knots at 70 percent maximum constant engine rating. The new series, which was under development for more than two years, is dubbed SuperSeaCats.

Hornbeck, Tidewater Sign Letter Of Intent To Merge

Hornbeck has entered a letter of intent with Tidewater to merge the two companies. The merger will be structured as an exchange of approximately 8,780,000 Tidewater shares for all Hornbeck shares. The boards of directors of both companies have approved the combination, subject to the negotiation and execution of a definitive agreement. The merger is expected to be completed in early 1996.

Hornbeck and its subsidiaries own, manage and/or have an interest in and operate a fleet of 90 vessels, primarily serving the oil and gas industry. The fleet consists of supply, tug-supply, crew, safety standby and specialty service vessels with 61 units in the Gulf of Mexico and 29 in the North Sea. Tidewater reportedly owns and operates the world's largest fleet of vessels serving the international offshore energy industry and the largest rental fleet of natural gas compressors in the U.S.

NNS Names New VP Of Sourcing

Whylen (Len) C. Cooper joined Newport News Shipbuilding (NNS) as vice president of sourcing, responsible for all sourcing activities including international sourcing, supplier management programs and naval equipment procurement. Immediately prior to joining NNS, Mr. Cooper was with General Electric Power Systems in Schenectady, N.Y.

For more information
Circle 153 on Reader Service Card

Sulzer Extends Medium-Speed Engine Range

New Sulzer Diesel has developed a new, higher-output medium-speed diesel engine. The Sulzer ZA50S joins the successful ZA40S engine type, and offers a cylinder bore of 500 mm and a piston stroke of 600 mm. The engine has a maximum continuous output of 1,630 bhp/cylinder (1,200 kW/cylinder) at 450 rpm. It is available in configurations with six to nine cylinders, in-line, and 12-18 cylinders, V-form. As a result, it extends the power range of Sulzer medium-speed engine range to 29,340 bhp (21,600 kW).

Special attention has been paid to size and maximum operational reliability, low operation costs, low exhaust emissions and ease of maintenance.

First RTA48Ts Ordered

The first Sulzer RTA48T marine diesel engines have been ordered. Two six-cylinder models were ordered by Ishikawajima-Harima Heavy Industries Co. in Japan for two "Future

December, 1995

42" handymax bulk carriers. The engines will be built under license by Diesel United Ltd. The engine was introduced to the maritime community in June, 1995.

For more information
Circle 154 on Reader Service Card

Trinity Marine Acquires Chicago Bridge & Iron Co.

Trinity Industries Inc. has acquired certain assets of the Chicago Bridge and Iron Co.'s

88.5-acre shipyard in Pascagoula, Miss. The facility is on the Bayou Casotte Channel, and has built a variety of vessels and products for the maritime and offshore energy industries including barges, drill rigs and large steel modules since its opening in the late 1960s. The shipyard has been re-named Trinity Marine-Pascagoula, and will become the 21st shipyard in the Trinity Marine Group. The first project at the yard will be the construction of the \$60 million ocean surveillance ship for the U.S. Navy, which had been planned for Trinity's Halter Marine-Moss Point (Miss.) facility.

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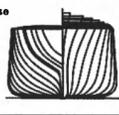
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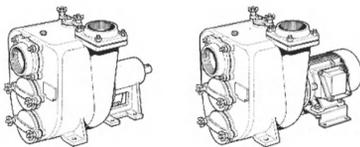
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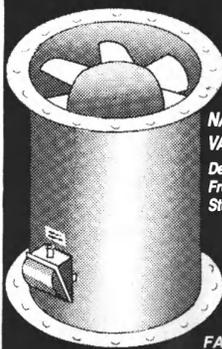


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PORT ENGINEERS - American Systems Engineering Corp. (AMSEC)
has provided Port Engineers and related marine services to the U.S. Navy, other government vessel operators and major ship operating companies for many years. As we expand our Marine Services Operations, we seek USCG licensed engineers with at least a BS in engineering, at least six years prior merchant vessel operational experience and significant depot/shipyard experience. NOAA, MARAD, MSC or commercial senior engineering management experience desirable. U.S. citizenship required. EOE. For further information, contact Andy Ott at (804)463-8666. Send resumes to:

SAIC Director of Human Resources
AMSEC, Dept. HR 94-137
2823 Guardian Lane
Virginia Beach, VA 23462

CHIEF NAVAL ARCHITECT and SR. NAVAL ARCHITECT

Prestigious naval architectural firm has opening for Chief Naval Architect and Sr. Naval Architect for New York/Washington, DC area. Must have degree in Naval Architecture, advanced degree helpful, and more than 10 years' experience in commercial ship design. Requires knowledge of Regulatory Body Requirements, including USCG, ABS, LR, DNV, IMO, etc. Must be competent in naval architecture, ship design including structures, hydrodynamics, stability, general arrangements, cargo gear, deck machinery, hull outfit, and specifications writing. Capability in CAD and FEA helpful. U.S. citizen. Able to manage technical programs, meet with customers and have executive oral and written communication skills.

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MA-95-87.

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Must have extensive "hands on" experience in all mechanical aspects of dry dock ship repair work, with particular emphasis on tail end overhaul and repair work. Must be familiar with all aspects of ships' technical plant - fixed and C.P. propulsion systems. Must be a self starter with excellent skills in the areas of planning, problem solving, and in the management of both material and human resources. Must have first class diesel and steam marine engineers ticket and/or university degree in engineering, and significant dry dock work experience. Applicants with other qualifications may be considered if they have the right experience. Halifax Shipyards offers a full benefits package, and salaries commensurate with qualifications and experience.

Attention: David Thomson
Halifax Shipyards Limited
P.O. Box 9110
Halifax, N.S. B3K 5M7

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European Ship Managers are looking for their WPB office for an Asst. Technical Superintendent, with experience as a certified Engineer or Superintendent o/b diesel powered ocean going vessels. Familiar with preventative maintenance systems and purchase requisitions/tracing procedures. Additionally, supervisory experience with dry docking, repair specifications, tenders preferred.

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Working experience with foreign crews o/b foreign flag vessels.

Please fax resumes to our West Palm Beach:

WMS Marine Services Ltd.
fax no. 407-688-1646
ph. no. 407-688-2600
Att: Technical Superintendent



Todd Pacific Shipyards Corporation has the following openings. Please mail or fax resumes to Todd Pacific Shipyards Corporation, HR Dept. PO Box 3806, Seattle, Washington 98124. Fax (206) 442-8503. Please no telephone inquiries.

TOOL ROOM SUPERVISOR needed to manage the shipyard's tool rooms including the purchase, storage, inventory, repair, distribution and safeguard of company tools. Experience with procurement and inventory control required. Three years of supervisory experience. PC skills required.

PAINT & BLAST FOREMAN. Responsible for the overall management of the Paint Department. Must be experienced in conventional, airless spray and all types of surface preparations. Equivalent of eight years in the trade including three years of supervisory experience. PC skills required.

SHIP SUPERINTENDENT. Minimum seven years experience in a shipyard environment including two years in a supervisory capacity. Experience in all phases of ship repair. PC skills required.

Todd is an equal opportunity employer.
Females and Minorities encouraged to apply.

PORT ENGINEER

USS Great Lakes Fleet, Inc. has an immediate opening for a Port Engineer. USS Great Lakes Fleet, Inc. is a major owner and operator of dry bulk, self-unloading, steam and motor vessels. The position will be assigned to our corporate offices located in Duluth, MN, and requires travel to ports located across the Great Lakes. Responsible for developing and managing repair and maintenance budgets, dry dockings, construction and damage repairs. Must work successfully with management, vessel, ABS, USCG personnel. Applicants must possess an Associate or BS degree in Marine Engineering, and have a valid USCG Engineer's license. Five years of sailing experience, preferably on the Great Lakes, is desired. Send replies to:

USS, Great Lakes Fleet, Inc.
Personnel Administration
Rm 400 Missabe Building
Duluth, MN 55802
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ENGINEER Jr. Level

International shipping company, located in New York City, seeks a junior level engineer for its technical staff. Position requirements include a B.S. degree in Ocean Engineering and experience with dBase program.

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If you work well in a team-oriented environment, this may be your ideal opportunity. PGS Exploration offers first-rate salaries and a comprehensive benefits package including major medical and 401k. Interested applicants should send their letter of interest and resume to: Office Administration, PGS Exploration (U.S.), Inc., 16010 Barker's Point Lane, Suite 300, Houston, TX 77079. (No phone calls or walk-in interviews, please).
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