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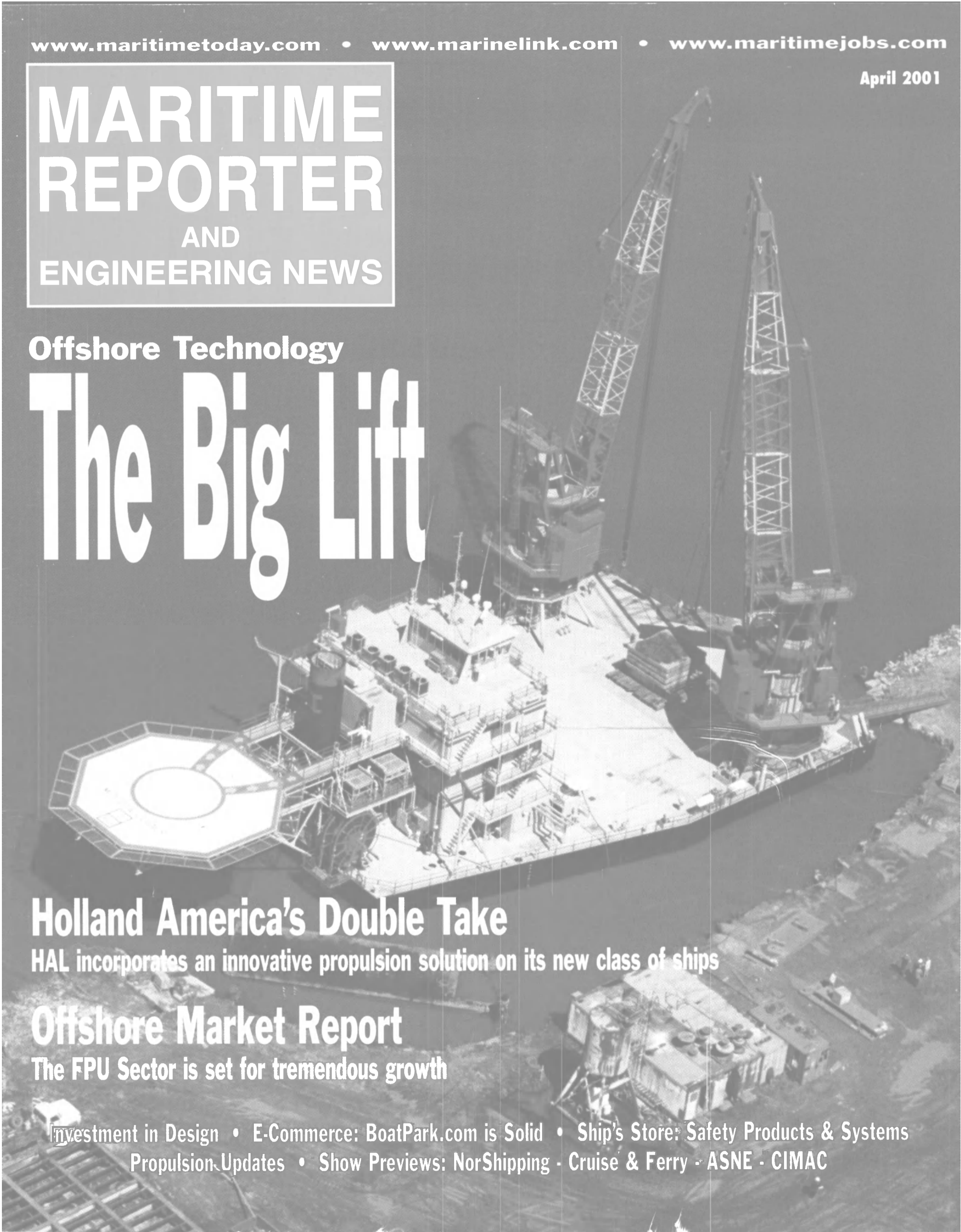
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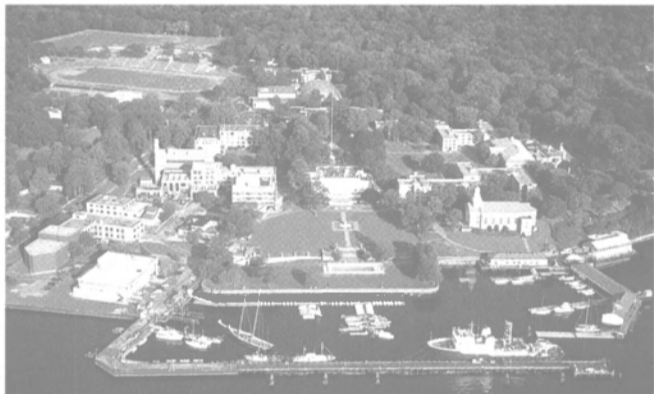
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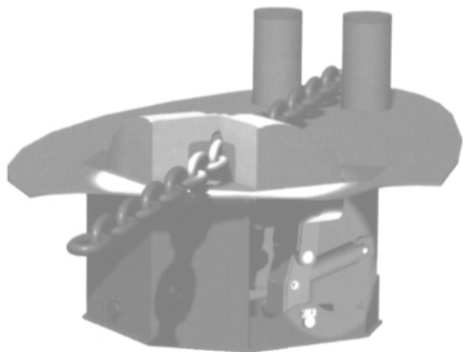
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Founder: John J. O'Malley 1905 - 1980
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On the Cover: Power Offshore's new liftboat M/V Dixie Legacy, built by SEMCO, was recently delivered. The vessel offers the offshore industry tremendous lifting power, compliments of its two Seatrax 175-ton cranes, both of which are able to rotate a full 360 degrees.

(Photo: Skeets Folse, Skeets Photo Service, Patterson, La.)

8 The New Knowledge Brokers

Germanischer Lloyd's **Lutz Wittenberg** contends that classification societies must evolve from rule enforcers and become technical knowledge providers over the life of a ship.— by **David Tinsley**

25 Cruise & Ferry: A New Vista

Holland America's new Vista series of cruise ships, which will offer an innovative diesel and gas turbine propulsion package never before employed on a cruise ship, promises to raise the standards bar in the cruise industry. — by **Regina P. Ciardiello**, senior editor

OFFSHORE ANNUAL

33 FPU Market Looks Attractive

In his recently published report, International Maritime Associates' **Jim McCaul** finds that the floating production system market is ripe for expansion.

Cover Story

40 Twice as Nice

The M/V Dixie Legacy built by Semco for Power Offshore is a huge and unique liftboat, offering unmatched lifting capacity compliment of a pair of 175-ton Seatrax cranes. — by **Greg Trauthwein**

54 Propulsion Report

Stena Discovery performance enhanced with unique steering system; CIMAC Set for Hamburg; First order logged for Dolphin system; Voith adds to its innovative range; Wartsila goes smokeless via common rail.

67 The Time to Buy is Now

The U.S. ship and boatbuilding market is set for a new order boom. **Allen Walker** of SCA explains why.

12 **E-Commerce:** BoatPark.com stays strong.

14 **Legal Beat:** IRS proposes new regulations regarding sources of income from activities in International Waters

15 **Are Vessels Patentable?**

20 **ASNE Preview**

25 **Cruise & Ferry Preview**

78 **Buyer's Directory**

80 **Advertising Index**

81 **Classifieds**

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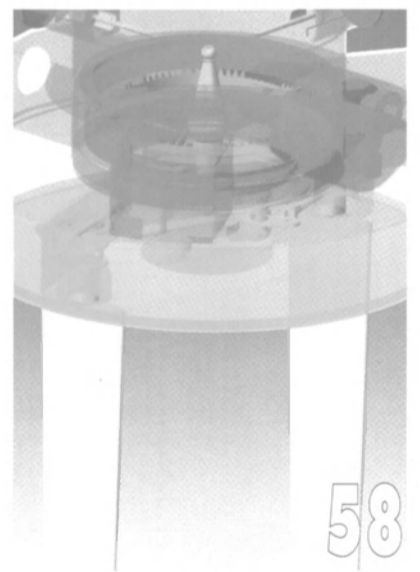
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International Operations

CHARLES E. KEIL, Vice President

215 NW Third Street

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Tel: +561-732-0312; Fax: +561-732-8063

24-hr Tel/Fax: +561-998-0313;

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Scandinavia

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Editor's Note

Quality, quality, quality. Ship and boat owners seeking to build a long-term profitable marine business are making this factor the cornerstone of decision making. Whether it be mandated by new legislation, or simply chosen as a marketable competitive advantage, companies that own and operate vessels should be demanding that everything — from vessel design, to equipment and systems, to personnel training techniques — are of the highest quality, or more accurately, the highest quality within the company's budget.



Marine companies in 2001 and beyond are seemingly in a perpetual battle to prove that their company, their industry, is a quality run operation, and an operation that is the most cost-effective, environmentally sound method of moving cargo, as compared to air, road, and rail. Unfortunately, though, a scant number of high-profile disasters and the resulting pollution problems — the latest being the sinking of the Petrobras rig off of Brazil — leave an indelible mark on the mind of the public, thus forcing legislators to act, sometimes in haste.

At a recent meeting of the Ship Operations Cooperative Program (SOCP) in New Orleans, owners and operators representing some of the largest inland marine companies in the world — Kirby, Ingram Barge Co., Canal Barge Co., etc. — stressed the need for marine companies to be proactive in promoting the industry's "good news." In addition, the companies discussed the steps that must be taken, such as investment in new technology and a strong commitment to training and education, that will lead to an overall raising of the standards bar. (see story on page 66).

In fact, three of the world's leading classification societies, ABS, DNV and LR, have developed a series of initiatives designed to improve safety in international shipping. Details of this 10-point plan can be seen on page 73. Germanischer Lloyd's Lutz Wittenberg goes so far as to suggest that the classification societies should become the technical knowledge providers over the life of the ship, rather than the rules enforcer. Mr. Wittenberg's views are detailed in David Tinsley's Investment in Design column, starting on page 8.

Gregory R. Trauthwein

www.marinelink.com

trauthwein@marinelink.com

MARITIME REPORTER AND ENGINEERING NEWS

ASSOCIATE PUBLISHER

Gregory R. Trauthwein • trauthwein@marinelink.com

NEW YORK
118 E. 25th St., New York, NY 10010
Tel: (212) 477-6700; Fax: (212) 254-6271
e-mail: mren@marinelink.com
Internet: www.marinelink.com

FLORIDA
215 NW 3rd St., Boynton Beach, FL 33435

EDITORIAL

Senior Editor

Regina P. Ciardiello • ciardiello@marinelink.com

Editorial Intern

Adrienne B. Crabtree

Technical Editor

David Tinsley

Editorial Consultant

James R. McCaul, president, International Maritime Associates

MARKETING

Vice President of Marketing

Susan Cosme • cosme@marinelink.com

Marketing Manager

Richard Grable • grable@marinelink.com
Tel: (561) 732-1659; Fax: (561) 732-6984

PRODUCTION

Production Manager

Sharon Griffin • griffin@marinelink.com

Asst. Production Manager

Oksana Martemy • martemy@marinelink.com

CIRCULATION

Circulation Manager

Dale L. Barnett • barnett@marinelink.com

ADVERTISING SALES

Vice President of Sales

Lucia M. Annunziata • annunziata@marinelink.com

National Sales Manager

Robert C. Howard • howard@marinelink.com
Tel: (561) 732-3001; Fax: (561) 732-6984

Regional Sales Manager

Jennifer Truman • truman@marinelink.com

Regional Sales Manager

Brett W. Keil • bkeil@marinelink.com
Tel: (561) 732-1185; Fax: (561) 732-6984

Regional Sales Manager/Electronic Product Sales

Joe Trubinsky • trubinsky@marinelink.com
Tel: (561) 732-4368; Fax: (208) 575-3217

Accounting Manager

Angelica Rivera • arivera@marinelink.com

Assistant to the Vice President of Sales

Tina Angelino • angelino@marinelink.com
Classified Sales
Tel: (212) 477-6700

PUBLISHER

John E. O'Malley
John C. O'Malley • jomalley@marinelink.com

Chief Financial Officer
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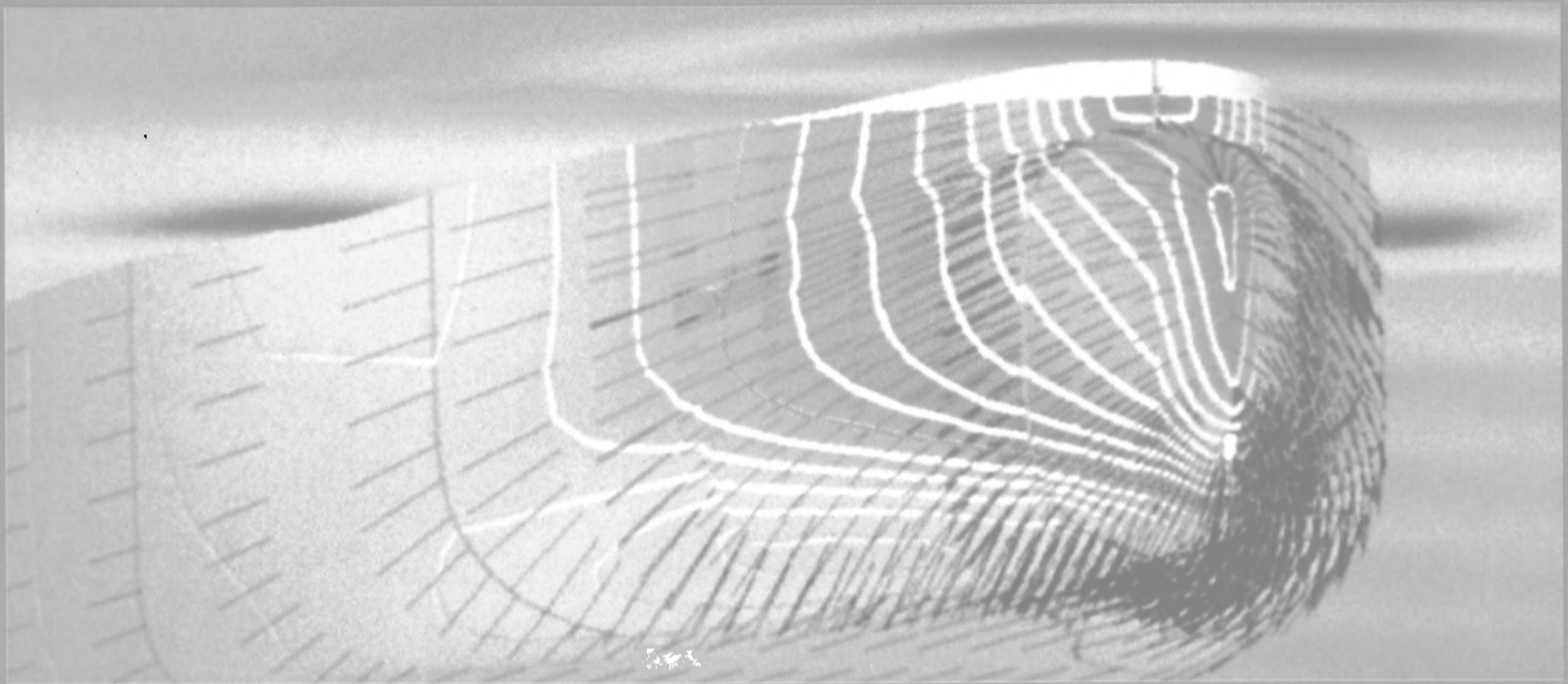
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The New Knowledge Brokers?



by David Tinsley,
technical editor

Increasing commercial pressures and structural changes in the maritime industries call for new approaches to better ensure vessel and equipment quality and improved safety, believes **Lutz Wittenberg**, Germanischer Lloyd's



GL's Lutz Wittenberg

divisional director of projects and marketing. In a bold presentation likely to spark controversy within a sector, which tends to have very set ideas about its function, Wittenberg indicated that classification societies needed to become technical knowledge providers over the life of a ship, rather than simply rule enforcers. While also advocating greater emphasis on continuous appraisal, rather than focusing on traditional annual inspection and the attendant cyclic peaking of vessel condition, he argued the case for societies being brought in at the earliest stage of a newbuild project as a way of better ensuring ship quality and long-term integrity.

Infusing fleet investment schemes from the outset with the kind of know-how and experience concentrated in class societies has greater-than-ever merit in today's era of reduced technical establishments and lean operations, out-

sourcing of technical competencies, much increased reliance by shipyards and equipment manufacturers on subcontractors, and shipbuilders' shift to series production methods.

The worldwide deterioration in newbuilding prices has forced shipyards to put economic pressure on suppliers of materials and components. "By way of subcontracting, suppliers are trying to spread the commercial risk," said Wittenberg, who also felt that "the lowering of standards and quality had become an obvious way for many in the industry."

He expressed concern over growing requests for class societies to ease requirements on certification of components. A resultant deterioration in quality was evident in the incidence of equipment or system failures and breakdowns during the guarantee period. The long-run impact of flaws, and attendant implications for ship safety as well as perfor-

mance, is accentuated by the shipyards' necessarily increased adoption of series production for all types of mercantile vessel. Of course, it is not the actual concept of maximized, repeat fabrication or construction which is under question, but the propensity for such methods to accentuate deficiencies in the initial design or componentry.

Design or construction flaws lead to long-term consequences involving vessel and equipment dependability and performance. Another expression of design shortcomings, cited by GL director, was where the nature and standard of layout and outfitting hindered maintenance routines. This increased the risk of failures in ship operating systems, especially as regards the drive train, with attendant safety as well as efficiency upshots. As a practical step in enhancing maritime safety, Wittenberg argues the case for clients retaining the class soci-

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Investment in Design

ety retained at the start of a project.

Engagement as early as the conceptual design phase is currently the exception to the rule, probably applying to less than 10 percent of the projects in which GL is involved. But it would be beneficial to all parties concerned, particularly in the light of increasing project or vessel complexity and reduced lead times, by better safeguarding against design errors and potentially considerable, knock-on effects. "It also helps to rectify concepts that may require costly remedial action at a stage when purchasing or construction has already started," said Wittenberg.

According to the society extended scope of this nature would also ensure closer consideration at the early design stage of maintenance and operational requirements. "If we help owners to get ships that are designed for ease of maintenance, we will enhance the safety of shipping and reduce cargo losses," he contended. By proposing that the industry makes greater recourse in this way to the pool of knowledge available in the classification sector, Wittenberg was effectively advocating a broadening of the role of class from ensuring rule compliance to becoming a technical partner of owners and yards. While acknowledging the vital importance of the rule-enforcing aspects of ship classification, he stated that it was time "to utilize the accumulated know-how in classification societies to become a knowledge-provider for all stages of the life-cycle from design to scrapping of a vessel."

Significantly, Wittenberg is not an advocate of increased legislation and controls. "Today, we have reached a point where the cause of maritime safety will be advanced not by more regulations and inspections, but by more efficient implementation of the existing framework of rules and regulations," he pointedly observed to this writer. Controversially, he questioned whether the current system of major and minor surveys still adequately covered the survey needs to day of large bulkers, tankers or even containerships. Ways to carry out proper inspections on a more continuous basis need to be defined. Food for thought from Hamburg, indeed.

9,000-TEU On A Single Engine

Another milestone in linehaul vessel capacity is set to be reached with a clutch of projects in hand for boxships of the 9,000-TEU size. In a bid to ensure technical readiness in advance of actual shipbuilding contracts, and to assist potential clients in cutting newbuild lead times, Germanischer Lloyd has completed design studies for a 25-knot post-Panamax giant of 9,200-TEU.

Most significantly, the concept design lies within the bounds of the largest two-

stroke diesels already in production, and reflects containership fleet operators' overwhelming preference for single-engine, single-screw configurations.

Key elements of the investigations, carried out using the society's latest information technology (IT) tools, have included the evaluation of global

strength, maximum bending movement, hatch corner stresses, and fatigue behavior, with the accent on minimized use of high tensile steel.

While GL ranks in sixth place globally in terms of total tonnage and number of vessels under its class, the society's commanding position in the container

vessel sector owes much to a proactive approach to design and technology research and development. Earlier work on strength analysis and dynamic loading on an 8,000-TEU design, completed by GL in 1997 as part of a broader research program, has fed into the latest study.

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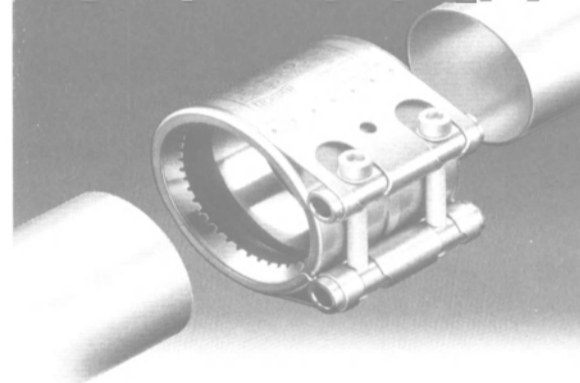
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Crowley Launches Refurbishment Of 25 Seagoing Tugs

Crowley Liner Services has launched a major refurbishment of 25 seagoing tugs to extend their lives at least another 15 years. These U.S.-flagged, Invader-Class vessels, each of which is crewed by six seamen, are widely used throughout the Crowley system for a variety of jobs, including the ocean towing of the

company's triple-deck RoRo barges between the U.S. mainland and Puerto Rico and specialized contract services.

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performance and reliability of the tugs, each of which is capable of generating a powerful 150,000 pounds of bollard pull ahead and 7,200 maximum continuous bhp. "The long-term investment made in the refurbishment of these tugs is of great benefit to our customers because it helps us to maintain the service reliabil-



ity and schedule integrity they have come to expect," said **Tom Crowley, Jr.**, chairman, president and CEO of Crowley Maritime Corp.

To date, five tugs have been refurbished with five scheduled to undergo the process over the next 12 months. The work is being done at North Florida Shipyard in Jacksonville. In addition to the engine refurbishments, a host of other improvements are also being made, including the complete remodeling of interior living spaces and newly designed modular control consoles designed by Crowley's electronics specialists. "Our goal is not just to refurbish the tugs to like-new condition, but to improve their functionality," said Crowley director of Engineering **Mike Golonka**. "We have a valuable resource in the crew members and operations personnel who have worked on these tugs during the past 25 years," he said. "Who better to ask about improving the tug's design than the crew who uses it and the operations crew who keep it going?" Crewmembers were interviewed and operations personnel were asked for input about the tugs' strengths and weaknesses. In addition to giving everyone an important role in the project, the analysis yielded improvements that could be made during the refurbishment. Even minor information that was gathered made a major difference in the overall functionality of the refurbished tug. For example, by adding a small light over the chart table, the Master would no longer have to turn on the overhead light on the bridge — a problem that previously caused him to lose night visibility. Stairs and ladder stripping were replaced with a more effective, non-skid coating to reduce the risk of injury. Also, while in the process of rebuilding the interior, Ethernet connections were installed in anticipation of a future LAN system to support PC-based Integrated Vessel Management Solution (IVMS) systems.

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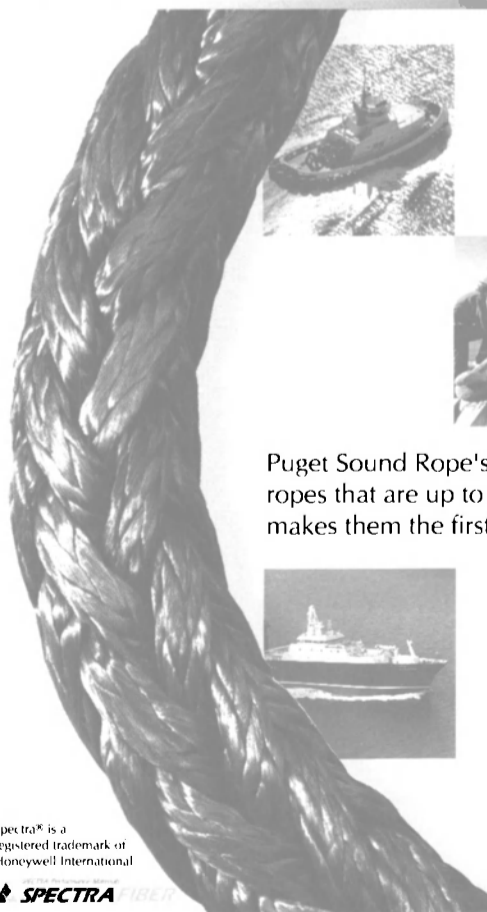
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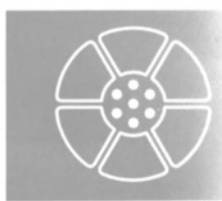
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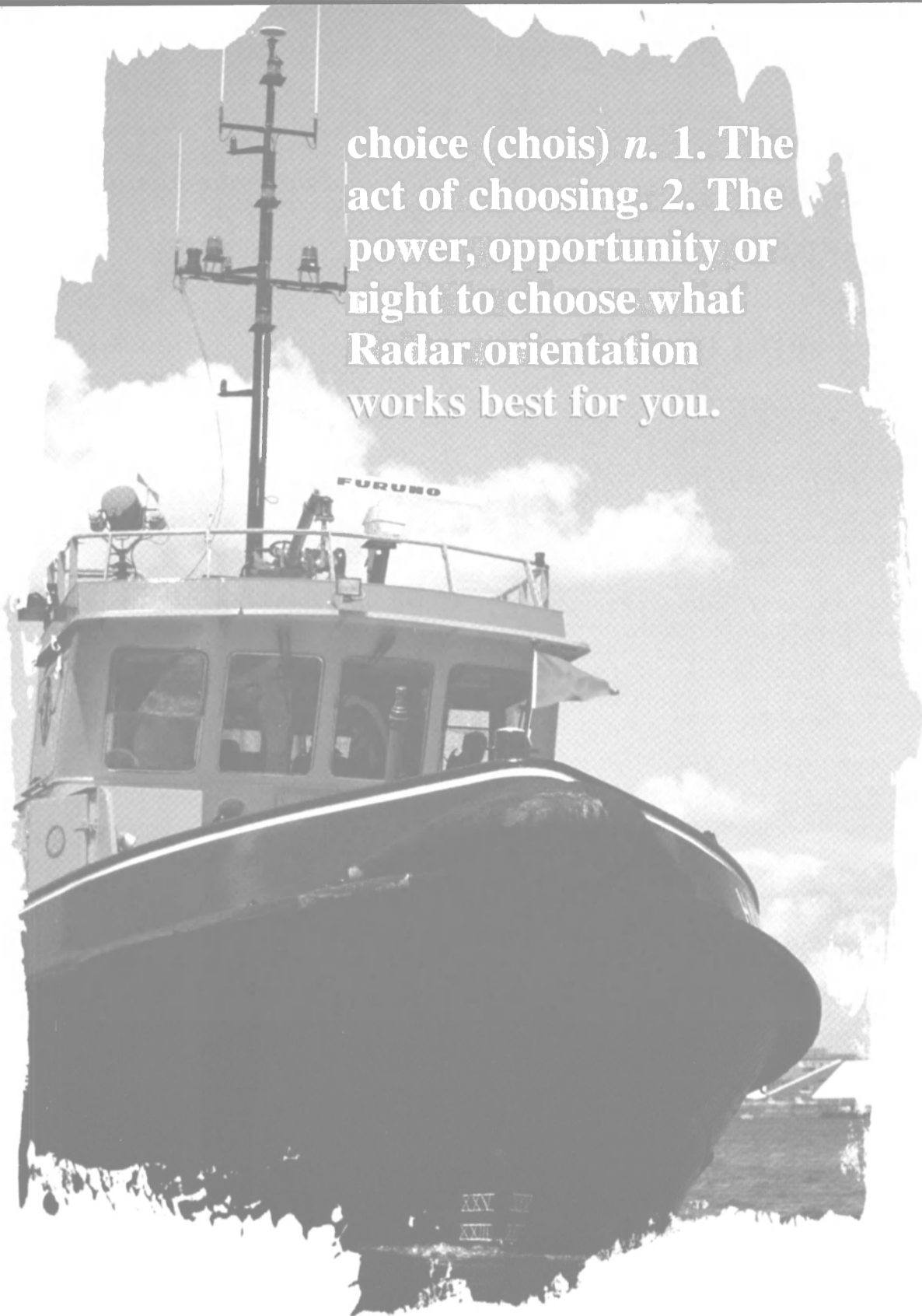
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E-Commerce

Boat-Park.com — The Virtual Trade Show That Never Sleeps

Operating 24-hours a day, seven days a week, WebPark Corp.'s Boat-Park.com offers customers with seamless online services — melding together the online boating/marine community manufacturers, suppliers, distributors, marinas and

trade associations. The site, which is a "webable" (ASP) software application, provides the infrastructure that enables B2B marine customers to partake in newsgroups, e-letters and forums that include live events. WebPark Corp.

establishes virtual industrial communities called WebParks, which are divided into sectors inhabited by companies, trade magazines and industry associations, bring members of a specific market into a virtual industrial zone.



The WebPark software component boasts a market search engine that assists a customer in conducting precise searches of data, products and service offerings of an entire industry. A suite of tools, including WebPark Order, WebPark Extranet and WebPark Data Management allow members to conduct active e-business. Based in Boston, Mass., WebPark's Boat-Park is a U.S. subsidiary of the parent Web Park AG located in Germany. "The multi-faceted operation," according to Web Park COO **Peter Atwood**, "is user friendly for boat manufacturers who want to purchase parts, supplies and components."

Atwood is speaking of the site's function as a virtual trade show that allows members to log on and access Boat-Park's database of suppliers, which directly links them to each company's own Web site. Here users will be able to peruse through each company's home page, which includes anything from the latest company news to new product releases — the same sort of information that would be present at a company's trade show booth — hence a "virtual trade show where members can present and sell their products and services to potential customers."

While many Internet companies have been hard-pressed to keep their financial head above water, **Atwood** is certain that the WebPark innovation will not experience the same fate, specifically because of its modest approach into the dot.com marketplace — unlike some new Web start-ups, the company didn't "spend too much money, too fast."

If anything the company is on the brink of expansion, rather than destruction, as Boat-Park plans to introduce the newest version of its site — the five button implementation — which is being touted as more user friendly with additional e-procurement. The company is also working to expand its services beyond the recreational market by further delving into the commercial arena. According to **Atwood**, markets that expect to be targeted by the site will include ferries and tug boats.

Circle 6 on Reader Service Card

LevelSeas Buys SeaLogistics

The inevitable slimming of the E-Commerce side of the marine business has commenced, with several majors dropping out of business and others merging. Last month, London-based e-shipbroker LevelSeas acquired its main

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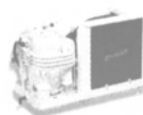
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competitor, Houston-based SeaLogistics, and New-York based MaritimeDirect closed its doors forever. Yet another, OneSea, indicated that a merger was imminent.

The news comes as little surprise as — for anyone who has not spent the last six months in a cave — it is painstakingly evident that the dollars behind speculative E-commerce start-ups are dropping faster than their stock prices. Simply put, with the world economy entering shaky new ground, less investment dollars are available, and fewer still for businesses that show little to no hope of generating significant revenues.

LevelSeas was founded by Shell, Cargill, and London shipbroker Clarksons in April 2000, to broker ships for cargoes over the Internet. It has always been seen by the shipping industry as the lead contender, closely followed by SeaLogistics.

The deal with SeaLogistics is designed to strengthen LevelSeas' position in the tanker markets especially. LevelSeas' core business is e-broking, but the platform also offers voyage-management and risk management tools. Freight futures trading will also be offered.

The first major shipping e-broker to fold was London-based Shipdesk, which failed to re-open its offices in the New Year, while MaritimeDirect had also talked of entering the e-broking market.

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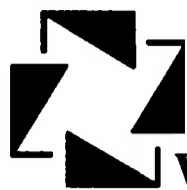
Shipyards and marine and offshore fabrication facilities across North America are being offered a new way to fill their design and drafting requirements. Genoa Design International Ltd. has launched a unique web-based system that facilitates the delivery of detail design and drafting services through the Internet.

From its base in Newfoundland, Canada, Genoa Design manages projects through a combination of traditional and on-line technologies. Detail design, drafting and 3-D modeling work is done by in-house designers and engineering technologists using industry-standard computer applications. Project management is handled through the Design Information Control System, Genoa's copyrighted Internet software.

Genoa Design's system simulates on-site design teams while reducing costs for clients. Using the system, clients can view work in progress and supply technical feedback in a secure online environment.

"For most of our potential clients, production and detail design requirements fluctuate," explained Genoa Design's president, **Leonard Pecore**. "We're offering them an economical and stable solution to meet their changing needs. They can get their work done right away with the added convenience of being able to virtually look over our shoulders at their work in progress, 24 hours a day."

Genoa Design has been serving the marine and offshore sectors since 1995. To learn more about the company and its Design Information Control System, visit the company's web site at www.genoadesign.com.



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Circle 305 on Reader Service Card

Legal Beat

Proposed Regulations Regarding Source of Income From Activities In Intl. Waters

By Edward M. Barberic, partner,
Dyer Ellis & Joseph, P.C.

The Internal Revenue Service (the "IRS") has issued proposed regulations under section 863 of the Internal Revenue Code of 1986, as amended (the

"Code"), providing new rules for determining the source of income from activities conducted in international waters for purposes of U.S. income taxation. These new regulations come shortly after the release last year of regulations

under Section 883 of the Code that significantly affected the exemption from U.S. income tax of income from the international operation of a vessel owned by a non-U.S. corporation. While the new regulations also apply to

space activities and similar new regulations apply to communication activities, the new rules may have the most significant impact on both U.S. persons engaged in shipping activities through a foreign corporation and foreign shipping companies currently doing business in the United States. The IRS is accepting written comments on the proposed regulations and there will be a public hearing that is currently scheduled for March 28, 2001, although we understand that, because of the interest generated by the proposed regulations, the IRS intends to delay the hearing until May.

While U.S. citizens, resident aliens and domestic corporations are generally taxed by the United States on all of their worldwide income regardless of where such income is earned, the source of income remains important for such purposes as determining eligibility for the foreign tax credit. For nonresident alien individuals and foreign corporations doing business in the United States, only income derived from U.S. sources is normally taxable. Whether income is from sources within or without the United States is determined for U.S. tax purposes by a set of technical rules contained in Sections 861 through 865 of the Code.

The determination of the source of income from activities conducted in international waters is made under Section 863 of the Code (which also provides sourcing rules for certain transportation activities, space and ocean activities and international communications activities). In general, income from ocean activities conducted by a U.S. person is sourced to the United States, and income from ocean activities conducted by a non-U.S. person is sourced outside the United States. The new regulations alter this treatment in certain situations so that ocean activity income derived by a foreign person may now be sourced to and taxable in the United States. Definition of Ocean Activity. Prop. Reg. § 1.863-8(d)(1)(ii) provides that ocean activity is any activity conducted in international waters, with certain exceptions. Under the broad definition in the new regulations, ocean activity includes:

- the performance and provision of services;
- the leasing of equipment or other property located in international waters;
- the licensing of technology or other intangibles for use in international waters;
- the production, processing, or creation of property in international waters;
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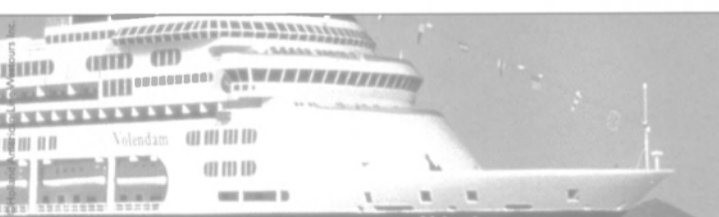



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of oil, gas and minerals and the performance and provision of services related thereto, to the extent the mines, oil or gas wells are in international waters:

- underwriting income from the insurance of risks on activities that produce income derived from ocean activity.

Ocean activity does not include any activity giving rise to transportation income, defined under Section 863(c) of the Code to mean income from the use, hiring or leasing of a vessel in connection with transportation that begins and/or ends in the United States.

Sourcing Income of U.S.-Owned Foreign Corporations. With respect to the source of income from ocean activities, the proposed regulations alter in two significant ways the general rule contained in the Code. First, Prop. Reg. § 1.863-8(b)(2) provides that if a foreign corporation is 50 percent or more owned by vote or value (directly, indirectly or constructively) by U.S. persons and is not a controlled foreign corporation, all income derived by the corporation from ocean activity

is currently taxable as U.S. source income.

This proposed rule would prevent such U.S.-owned foreign corporations from sourcing income derived from ocean activities to sources outside the United States. More importantly, the new regulations adversely impact the controlled foreign corporation ("CFC") rules, making it much more difficult to delay U.S. taxation of the income of a U.S.-owned foreign corporation by intentionally adjusting the U.S. ownership

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Are Vessels Patentable?

Marine architects and engineers frequently hear comments that a new vessel is simply a redesign of an old ship, and there is nothing patentable about it. 35 USC, which incorporates the patent laws, indicate anything, which is useful, new, and unobvious can be patented. This includes new combinations of old items, which do something new. For example, a new fast workboat which goes 15 knots faster than an older design because of changes in engine room location or fuel tank location would be a patentable design, even though fuel tanks and the original hull design may be known technology. It is the combination of the features to do something faster and better, or cheaper than known techniques, which makes things patentable.

So, what can be patented? Vessel designs, retrofitting techniques, new types of heads, new types of fuel tanks. Control devices, combinations of safety devices in engine rooms, personal safety devices, non-skid paints for decks, ways of double hulling a ship which was originally a single hull, new power systems, ways of connecting winches and towing mechanisms together, articulated barge designs and so on can all be patented if they are new, and unobvious.

The new laws permit the holder of an invention to file for protection as either a normal utility patent or as the new provisional patent applications (which are far less expensive than traditional utility cases.) The provisional patent applications permit the owner to say "patent pending" and obtain, at no additional cost, rights in 77 foreign countries for 11 months. The filing of provisional patent applications has become very popular in other market segments because of the marketing value for advertising "patent pending" and the phrase "extensive foreign rights" during trade shows and other events.

Another new law decided by the U.S. Supreme Court permits new methods of doing business to be patentable. Methods of doing business over the Internet, which was not done before, can be the subject of U.S. patent applications.

Why patent? Many companies use patents as marketing tools, instead of saying "new and better" they use "patent pending." Other companies use their intellectual property to collateralize their bank loans and lines of credit. Still other companies which want to do joint ventures and IPOs look at the patent and trademark portfolio as critical to obtaining the highest possible valuation for their companies with the market analysts. Lastly, some companies use patent to simply sue others for whatever they can settle on, or to use the law suits to obtain industrial intelligence. Intellectual property and the marine time industry have come a long way in just a few years.

The preceding was submitted by Buskop Law Group, P.C.

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Legal Beat

structure to avoid CFC status.

Sourcing Income of Foreign Persons. Second, Prop. Reg. § 1.863-8(b)(3) provides that, if a foreign person is engaged in a U.S. trade or business, the foreign person's income derived from ocean activity is presumed to be U.S. source income. The regulations provide that if a foreign person can allocate gross

ocean income between (1) income from sources within the United States or international waters, and (2) without the United States and international water to the satisfaction of the IRS, then income from without the United States and from international waters will be treated as foreign source income. The new regulations also provide that when a foreign

person is entitled to the benefits of a tax treaty with the United States, the person may elect to be taxed under the rules of that treaty so that the United States would tax only income attributable to a permanent establishment of that foreign person in the United States.

Under these proposed regulations, a greater portion of a foreign person's

shipping income is now exposed to potential U.S. taxation. In some situations it is possible that the United States will attempt to tax income that is only remotely connected to U.S. operations and that previously was not taxed in the United States.

The proposed regulations must be applied to determine the source of income from sales of property purchased or produced by the taxpayer when either the production or the sale occurs in international waters. The new rules are complicated and require quite technical income allocations. Similar rules are provided for sourcing income derived from the performance of services in international waters. The proposed regulations also provide new rules for sourcing the income of partnerships engaged in ocean activities, basically sourcing U.S. partnership income at the partnership level, and sourcing foreign partnership income at the partner level. We recommend that all persons engaged in the shipping, offshore oil and gas exploration and production, and cruise ship industries become familiar as soon as possible with the new regulations. Treasury regulations go into effect 30 days after the publication of final regulations, and final regulations are typically issued six months to one year after proposed regulations are issued. Taxpayers should seriously consider submitting comments to the IRS regarding the impact of the regulations, either individually or in conjunction with trade associations or other persons that will increase the impact of the comments.

Given their potential negative effect, the new regulations may warrant a substantial restructuring of the ownership of vessels engaged in the affected activities. Even though taxpayers are permitted to produce evidence rebutting the presumptions in the new regulations with respect to the source of income, such evidence must be "satisfactory" to the IRS. The uncertainties inherent in trying to determine what particular evidence may ultimately satisfy the IRS suggest that the better option is simply to alter the ownership of vessels and foreign corporations so that the new regulations are not applicable. Since a significant restructuring may prove time consuming, an examination of the potential impact of the new regulations on a particular company should begin as soon as possible.

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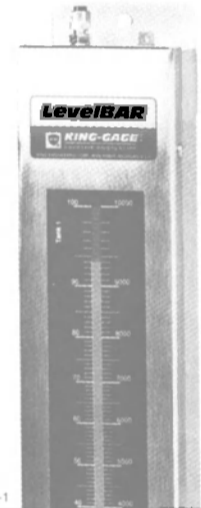
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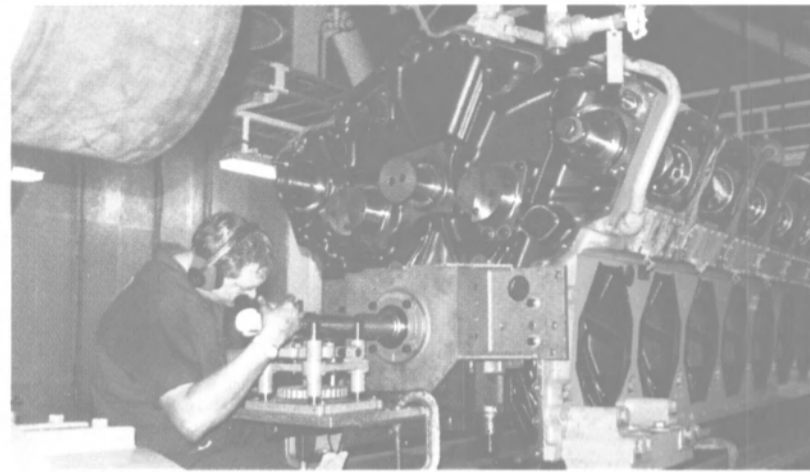
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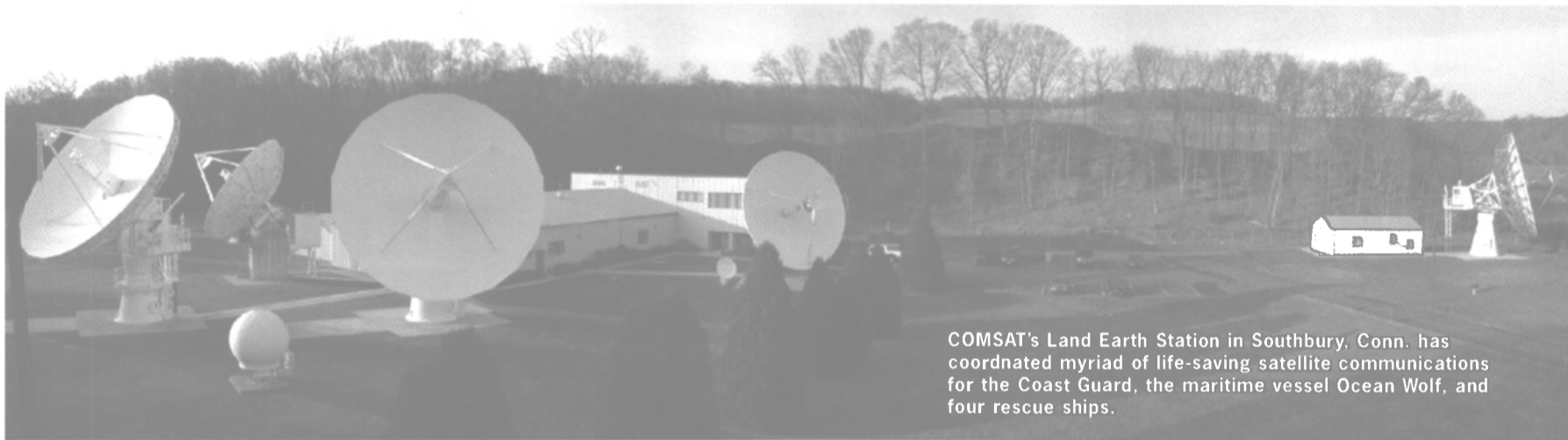
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COMSAT Mobile Communications Working With U.S. Coast Guard To Save Lives At Sea



COMSAT's Land Earth Station in Southbury, Conn. has coordinated myriad of life-saving satellite communications for the Coast Guard, the maritime vessel Ocean Wolf, and four rescue ships.

Two employees of the COMSAT Mobile Communications (CMC) Land Earth Station in Southbury, Conn., were recognized recently by the United States Coast Guard (USCG) for coordinating life-saving satellite communications for the Coast Guard, the maritime vessel Ocean Wolf and four rescue ships.

The incident began around 6:30 p.m. EST on Monday, October 30, 2000, when the (USCG) Station in San Juan, Puerto Rico, contacted Southbury requesting assistance in communicating with Ocean Wolf, which had suffered an explosion in the engine room and was taking on water. Unknown at the time was the extent of damage and danger to the vessel — it was adrift and Tropical Storm Joyce was bearing down on its location.

Ocean Wolf was in the Atlantic Ocean, more than 420 miles east of the nearest land area — the Caribbean island of Guadeloupe, which was out of radio range and too far from Coast Guard ships to reach her quickly. COMSAT-C satellite service was the only means of communication available. COMSAT-C is a low-cost, digital messaging service used for telex and data applications such as e-mail, Global Positioning and Global Maritime Distress and Safety messages.

Theresa Edwards and Joe Wheelahan

at CMC's Southbury earth station immediately began determining locations of ships near the Ocean Wolf and requested their assistance. After sending a "no cost safety message" and polling ships in the area, Edwards and Wheelahan determined there were four ships within three hours of reaching the distressed vessel. A short time later, the Thorsriver responded to the emergency and diverted to assist the Ocean Wolf.

"We knew the damage was serious and time was critical if we were going to be able to successfully coordinate help," said Wheelahan, who with

Edwards, was working the night shift at the Southbury facility. "We assisted the Coast Guard by sending satellite messages that diverted the two closest ships that had the necessary onboard equipment to assist the Ocean Wolf," he added.

Coast Guard duty watchstander T. O'Brien of the San Juan Station noted that CMC's Southbury facility provided the critical communications link for the coordinated rescue effort that saved two lives aboard the Ocean Wolf.

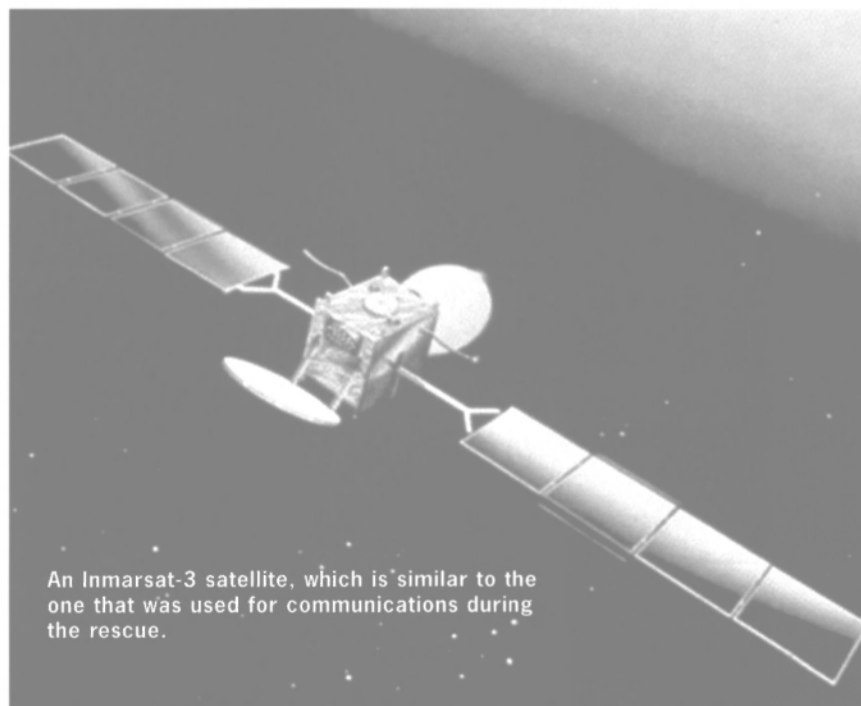
According to Rick Kenney, Automated Mutual-assistance Vessel Res-

cue (AMVER) Maritime Relations Officer for the (USCG), "COMSAT Mobile's land earth stations have been a major element in providing critical communications in search and rescue efforts taken on by the Coast Guard. CMC's land earth stations have been on the receiving end of many emergency and distress communications that have resulted in Coast Guard rescue teams saving hundreds of lives at sea every year. We at AMVER have nothing but admiration for the staffs at CMC's land earth stations."

As one of their essential duties, the staffs at all of CMC's land earth stations, including Santa Paula, Calif.; Kuantan, Malaysia; and Southbury, are specially trained to coordinate emergency communications with international, federal and local safety, search and rescue organizations.

"It is very gratifying to hear that our efforts helped save two lives," Edwards said. "We coordinate mobile satellite communications for emergency situations quite a few times every week but very rarely hear back from the parties. We are happy that the Coast Guard let us know that we did make a difference with the Ocean Wolf."

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An Inmarsat-3 satellite, which is similar to the one that was used for communications during the rescue.



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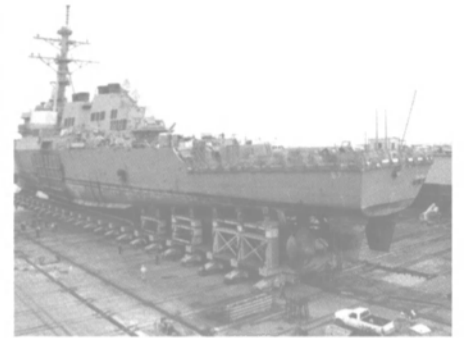
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ASNE Preview

ASNE Day 2001 To Feature Timely Technical Papers, Informative Exhibits

The American Society of Naval Engineers (ASNE) annual exhibition, conference, and annual meeting, ASNE Day 2001, is set for April 30 - May 1, 2001 at the Hyatt Regency Crystal City Hotel in Arlington, Va. Attendees and exhibitors will have the opportunity to see the latest products on display and to listen to military leaders and industry executives discuss issues critical to naval engineering as we enter the next millennium.

ASNE Day events begin Monday, April 30 with a plenary session. The conference's keynote speaker is RADM **Jay M. Cohen**, USN, Chief of Naval Research. Admiral Cohen's address will focus on the ASNE Day 2001 theme, "Technology Insertion in the 21st Century Fleet," and will discuss the important role the Office of Naval Research plays in meeting the future needs of the Fleet. His address will be followed by a panel discussion on Technology Insertion with senior representatives from Naval Sea Systems Command, Program Executive Offices, and the Navy Laboratories. After the plenary session, ASNE will recognize the technical program's authors and moderators, and present the ASNE's prestigious Sol-



ASNE 2001 will feature a plenary session with technical presentations discussing the sealift and transport of the USS COLE and its repair requirements.

berg, Jimmy Hamilton, and Claud A. Jones Awards at the Awards Luncheon. This year's luncheon speaker is ADM **William J. Fallon**, USN, Vice Chief of Naval Operations. The admiral is expected to provide a first-hand perspective on the readiness and modernization challenges facing the Navy today and in the future.

After the luncheon, the technical paper program commences with two concurrent technical session tracks. The technical program will include six sessions of technical papers presentations with topics including Technology Insertion in Today's Fleet; Ship Design and Modeling; Shipboard Equipment; Shipboard Diagnostics; Naval Logistics; and Maritime Environmental/Logistics.

ASNE is also offering two Professional Development sessions with continuing education credit on Wednesday, May 2, in cooperation with the Society of Naval Architects and Marine Engineers, (SNAME). These sessions on Feasibility Studies and Preliminary Design and on Naval Architecture provide excellent refresher training for the new professional licensing exam in Ship Design Engineering. For more information contact **Kelly Bentley** in the ASNE office (703) 836-6727.

The ASNE Day 2001 exhibit hall continues the tradition of bringing together the latest products and services in naval engineering to showcase to ASNE Day attendees and visitors. The hall will be open to the public from 8:30 a.m. to 6:30 p.m. on Monday; and from 8:30 a.m. to 5:00 p.m. on Tuesday. At press time, more than 130 booths have been reserved and an additional 25 more are expected.

If your company would like to exhibit, there is still space available. Contact **Megan Sinesiou** at the ASNE office at: (703) 836-6727; or **Carey Filling** at (703) 413-9596. Or log on to the Society's Web site at www.navalengineers.org.

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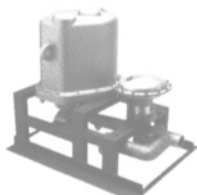
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News

Adsteam To Buy Howard Smith

Australia's Adsteam Marine Ltd. agreed to buy Howard Smith Ltd.'s Australian and U.K. towage businesses for \$248 million. Adsteam plans to use a \$163 million bank debt facility from National Australia Bank Ltd. to finance the deal which includes the remaining

50 percent of its Australian towage joint ventures with Howard Smith as well as Howard Smith's wholly-owned Australian and U.K. towage businesses. It also plans to undertake an equity raising of A\$180 million, underwritten by ABN AMRO Rothschild and UBS Warburg.

Prior to the acquisition of Howard Smith, Adsteam Marine was the largest

operator of marine towage services in Australia with extensive other marine services operations in this country and overseas. The company has a history of providing marine services dating back to 1875, when it commenced operations as the former The Adelaide Steamship Company Limited group. Of the 51 ports requiring towage in Australia,

Adsteam Marine has a towage presence in 33 ports and internationally has a fleet of more than 90 tugs either wholly owned or in partnership and joint venture operations. Its global maritime services operations were substantially expanded in 2000 through acquiring a 50 percent interest in U.S.-based Northland Holdings — the largest expansionary move by Adsteam Marine since its \$160 million public float in 1997. Northland later acquired the Bethel Fuel Sales Alaska-based fuel distribution business for \$26.5 million.

GSA Auctions "Perfect Storm" Rescue Vessel

A former U.S. Coast Guard cutter whose heroic rescues garnered notice in the movie, *The Perfect Storm*, made its debut on the U.S. General Services Administration auction Web site. GSA Auctions, <http://www.gsaauctions.gov>, after spending more than six months without a permanent home. Reported to the U.S. General Services Administration as excess by the U.S. Coast Guard in January 1994, the decommissioned Tamaroa was initially housed at New York's Intrepid Sea Air Museum until 1997. It was later housed at the Hudson River Park Conservancy until 2000. Tamaroa was originally the U.S. Navy commissioned vessel USS Zuni, a 205-ft. (62.4 m) salvage tug, which saw duty during World War II at Pearl Harbor and Iwo Jima and participated briefly in the Allied assault on Tinian.

Old Dominion Places Order With Gladding-Hearn

Old Dominion University's Educational Foundation has ordered a new research vessel from Gladding-Hearn Shipbuilding. The vessel, which will be designed by Roger Long Marine Architecture, has a modified-V aluminum hull, which measures 55 ft. (16.7 m) with a 17 ft. (5.1 m) beam. Its five ft. (1.5 m) draft allows the vessel to perform work in the shallow water near the shores of the Virginia coastline. Propelled by two Caterpillar diesel engines, each rated at 700 bhp, the vessel's engines two Hall & Stavaert five-bladed bronze propellers are turned through ZF 350A reverse-reduction gears. With a top speed of 22 knots, the engines, when operated at an 18-knot cruising speed, will burn approximately 50 gph, yielding a range of more than 600 miles.

Under the vessel's raised foredeck are a small laboratory, bunks, galley and head for eight research scientists and crew. Also onboard are a variety of systems that can be used to study plankton, temperature, salinity and nutrients.

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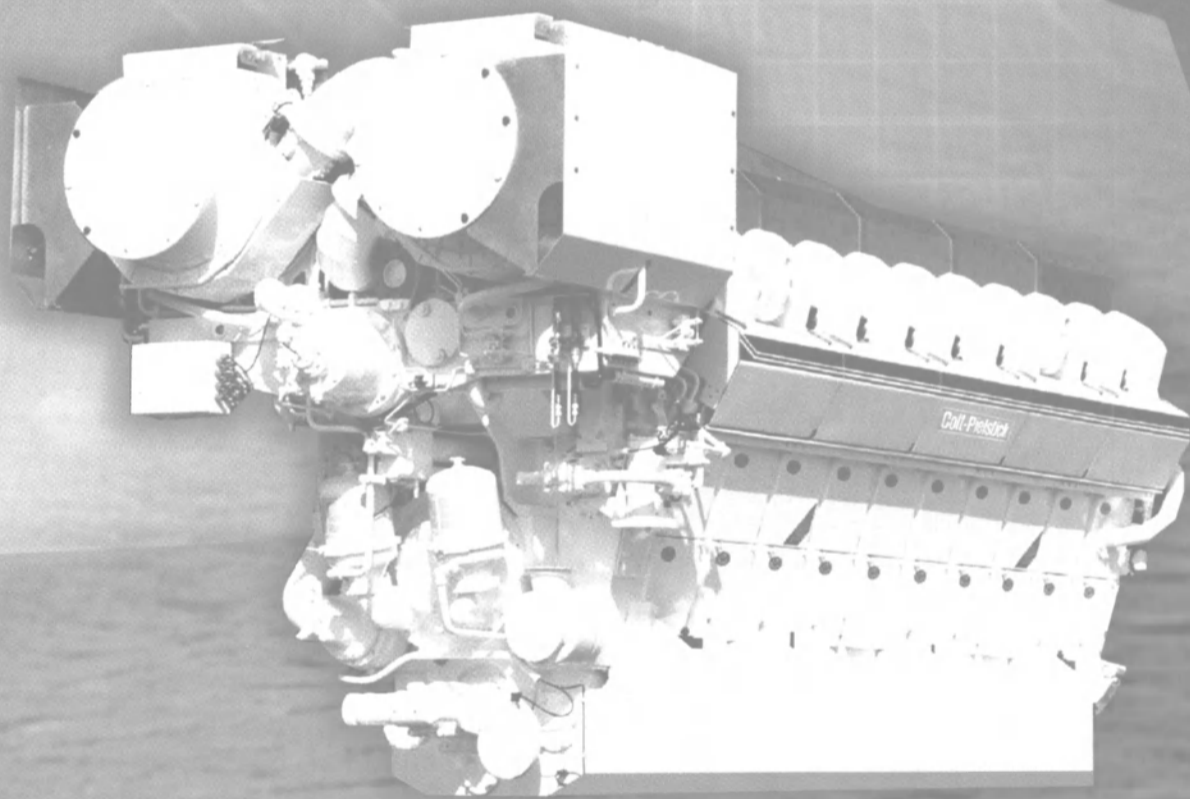
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News

Bollinger To Construct Pair of Vessels For Seacor Marine

Bollinger Shipyards has been granted a contract to build two 145.5 ft. (44.3 m) supply/utility vessels for Seacor Marine of Houston, Texas. Construction will commence at Bollinger's Lockport, La. facility in April and May with delivery

of the vessels scheduled for November and December 2001. Yet-to-be-named, each vessel will measure 145.5 ft. (44.3 m), with a 36 ft. (10.9 m) beam and maximum drafts of 10 ft. (3 m). They will be powered by two Cummins KTA-38MO diesel engines developing a total of 1,500 bhp at 1,600 rpm, driving Bollinger 72-in. x 57-in. stainless steel

propellers through Twin Disc reverse/reduction gears.

Two 99 kW Cummins generators driven by two Cummins diesels will produce electrical power in each. Two Quincy air compressors in each utility boat will start their engines, while a Schottel bowthruster driven by Cummins N-14 engine will provide addition-



al maneuverability.

Each vessel will boast 2,800 sq. ft. of aft deck space with a maximum deck load of 390 tons, as well as four mud tanks with a total capacity of 50,000 gallons of liquid drilling muds. Navigation and communications equipment onboard will be comprised of two JRC 48 mile radars; Furuno GPS; Comnav autopilot; Furuno radio; Standard Horizon Intrepid VHF radios with two remotes; and one Loudhailer with exterior hailer horns.

Blount/Barker Pens

Tug Contract

Blount/Barker Shipbuilding signed a contract with Buchanan Marine for the construction of an 85 ft. (25.9 m), 2,400 hp all welded, Twin Screw tug. The tug's hull and superstructure plans have been contracted via Bristol Harbor Marine Design, which will utilize CAD/CNC technology for all lofting and cutting. The tug will be keel cooled and equipped with two, four-blade stainless steel propellers measuring 70-78-in., as well as two pushing winches and an Almond Johnson towing machine. The tug is scheduled to commence construction in early April for a November completion.

Circle 16 on Reader Service Card

Rolls-Royce Designs Selected For 53 OSV's

UT-Designs and packages of equipment from Rolls-Royce have been chosen for 53 offshore service vessels (OSVs) during the past year. The transaction represents 70 percent of orders placed during the year and is the largest in this sector of the company since the mid-1970s. Twelve of these vessels were ordered just before the end of 2000 and will be worth \$57.9 million to Rolls-Royce — bringing the total value of these contracts to the company to \$246.3 million. The vessels, 16 of which are powerful anchor handlers, will be built in shipyards in Brazil, China, Denmark, Japan, Korea, Norway and Singapore; delivery dates will extend well into 2003. With the market favorite platform supply vessel leaning toward the UT755 in standard or long versions — 19 are on order. The long-established UT745 retains its popularity, with diesel electric versions also available.

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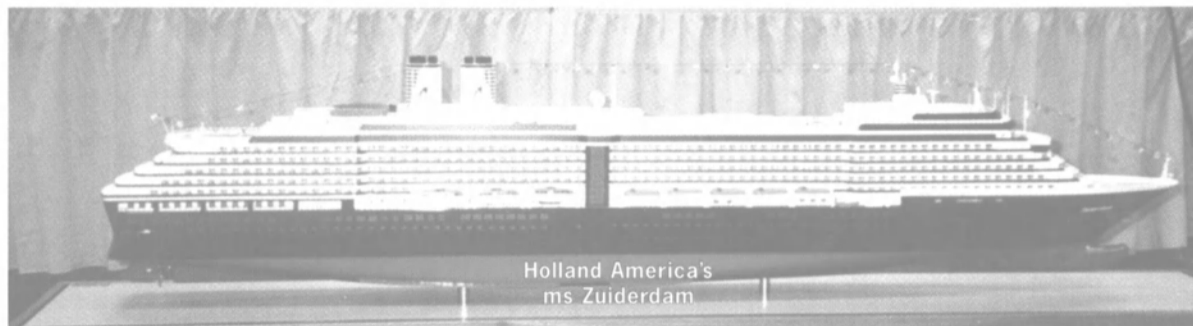
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Cruise and Ferry Report

Holland America's New Ship Series Points Toward New Vista



Holding on to its 128-year -dam tradition, Holland America unveiled two new additions to its fleet — ms Zuiderdam and ms Oosterdam — at the Seatrade Cruise Shipping Convention. Measuring 951 ft. (289.8 m) each, the duo, which will mark the beginning of the five-ship Vista Class Series, will be constructed at Fincantieri for delivery in September 2002 (Zuiderdam), and July 2003 (Oosterdam).

Representative of the South and East "Vista" points on the compass, the vessels embody technologically-advanced designs that will secure Holland America as a pioneer in the future of cruise ship design.

By Regina P. Ciardiello, Senior Editor

At 85,000 tons each, the first two ships of Holland America Line's (HAL) Vista Class series, Zuiderdam and Oosterdam, due for delivery in September 2002 and July 2003, respectively, will serve as the homes for a host of emerging marine technologies, and will surely, raise the quality bar for the entire industry. With ground-breaking technology seemingly remaining at the forefront of the cruise industry, last year could have been dubbed the "year of the gas turbine" when Celebrity Cruise Lines introduced this type of power on its new Millennium class ships. Never before utilized by the cruise industry, the GE LM2500+ gas turbine received much exposure from these ships, and since then other cruise lines such as Royal Caribbean and Princess have opted to use this power source.

Interestingly, Holland America (HAL) has decided to play the role of innovator (rather than follower) — with its own innovative power package. HAL, which is owned by Carnival Corp., who last year partnered with Finnish engine manufacturer Wärtsilä for a new smokeless diesel engine, has decided that each of the new ships will feature five Wärtsilä "Enviroengines," one gas turbine and Azipod propulsion. The Wärtsilä engine, which debuts on the new Carnival Spirit scheduled to set sail on April 29, has gained even further exposure as the diesel engine component of the power package onboard Cunard's mega ocean liner Queen Mary 2, which will debut in 2003.

Since each of the 1,848 passenger vessels will be operating on seven-day Caribbean and Alaskan cruises, the gas turbine concept will be a valuable asset while the ships are at port during their Alaskan itineraries. According to HAL's director of newbuildings, Pieter C. Rijkaart, the vessels will operate on five diesel

engines as their primary source of power, while the gas turbines will be utilized when the ship is at port, and in environmentally sensitive areas, such as Glacier Bay, Alaska.

Rijkaart, who has been designing the line's newbuilds for 16 years, has designed the Vista Series with two separate engine rooms — something that has never before been implemented on a cruise ship. The model of the new ship series that was unveiled at the Seatrade press conference demonstrated this idea with the presence of two side-by-side funnels placed strategically on the top deck of the ship.

When conceptualizing the new Vista design, Rijkaart envisioned that the new class would be the safest cruise ships afloat — what better way to capture this notion than to design a vessel that can still run on the gas turbine if the diesel engine package shuts down — hence the two engine room concept. "If there is a fire in the engine room, the ship can still move via one gas turbine at 10 knots," Rijkaart said.

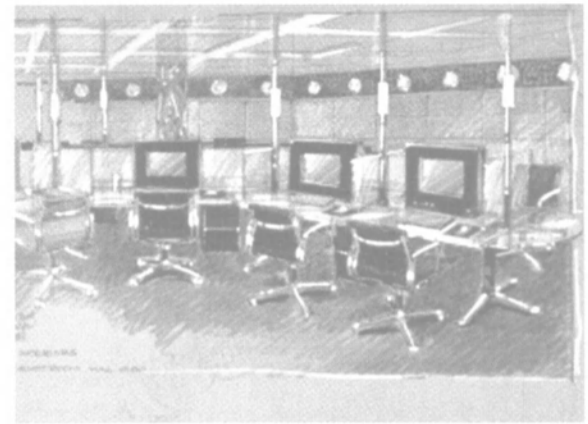
While the two rooms are adjoining, according to Rijkaart, they will operate on two separate electrical switchboards.

Safe Evacuation is Key

Another unique feature that HAL ships are known for are their large outside decks. While this is pleasing from a marketing standpoint, it is also beneficial in terms of safety. Since the decks are in fact so large, there is capacity for all passengers to remain outside during evacuation drills — hence no need for muster stations. According to Rijkaart, HAL's evacuation process is detailed and organized — passengers will find their lifeboat assignments located on the back of their stateroom doors. The crew is also given a complete list of occupied staterooms in order to perform a comprehensive roll call during these evacuation drills.

In addition to the standard IMO-required lifeboats and tenders, the Vista ships will also boast a fast rescue boat. Able to accommodate eight persons, the IMO-approved unsinkable vessel is lowered into the water like a conventional lifeboat, except it is designed to move at high speeds for quick aid to passengers.

As a member of the International Council of Cruise Lines (ICCL), HAL has adhered and will abide by a recommendation by the National Transportation Safety Board, (NTSB) to ICCL for locally sounding smoke alarms. As part of ICCL's new mandatory safety and environmental standards, all member-lines will now house smoke alarms that are audible in all passenger



Each member of the Vista Class will house an Internet cafe.

and crew staterooms, adjacent corridors and bridge. Prior to this new standard, cruise ships were only required to have smoke alarms on the bridge — therefore the entire Vista class will employ this new safety measure.

Main Particulars

Length, (o.a.)	951 ft. (289.8 m)
Length, (b.p.)	833 ft. (254 m)
Breadth, (molded)	106 ft. (32.2 m)
Scantling draft	26 ft. (8 m)
Max. speed	24 knots
DWT	7,200 tons



The new ship class will boast an expansive atrium.

Cruise + Ferry 2001 Preview

This year's Cruise + Ferry Exhibition promises to be even bigger than it was in 1999. The biennial show, which draws thousands of cruise and ferry operators, chief engineers, interior designers and naval architects is recognized worldwide as the premier exhibition in its market.

With more than 450 companies representing more than 45 countries already scheduled to show off their innovations, record visitor and delegate participation is also expected at the conference, which will be held from May 8-10.

With booths situated in London's Grand and West halls of Olympia, attendees will have the opportunity to meet and share ideas with the leading providers of products and services to the cruise, ferry and fast ferry industries. Organizations that have already registered include: Austal Ships, GE Marine Engines, Fincantieri, Kvaerner Masa-Yards, Incat and MAVCO — to name a few.

Sponsored by Lloyd's List Events, the conference will also feature presentations focusing on myriad of topics, which have contributed to the industry's buoyant presence. Programs held throughout the conference's three-day agenda will deal with Ship Design; Ship conversion, Speed and Propulsion; Interior Design; Safety; Operations & Management; and Environmental Policy and Pressures.

Also featured is the exhibition's headliner — the Cruise + Ferry Gala Awards Dinner. Scheduled for May 9, this event, which will be held at the Royal Lancaster Hotel, Hyde Park, London, honors the most innovative organizations in the cruise, ferry and fast ferry markets.

For further details regarding registration and/or exhibits, please contact: **John Wilson**, marketing manager, 69-77 Paul St., London EC2A 4LQ U.K., tel: +44 20 7553 1612; fax: +44 20 7553 1691, or e-mail: john.Wilson@informa.com, www.cruiseferrey.com.

Radiance of the Seas — A First Class Delivery

Radiance of the Seas, the first of the Radiance-class of ships, was delivered to Royal Caribbean Cruise Lines (RCCL) on March 9. The 962 ft. (293.2 m), 90,090-ton vessel departed on March 11 from Amsterdam, en route to the Port of Miami, arriving on March 21.

The 2,100-guest Radiance of the Seas is designed to sail world itineraries to Alaska, Hawaii, the Panama Canal, Pacific Northwest and the Caribbean. In addition to its slim, yacht like design with many glazed fronts, the ship is driven by an azipod propulsion system, and

Radiance of the Seas is powered by GE gas turbine engines.



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powered by smokeless, vibration-free GE gas turbine engines.

Built according to DNV Classification standards, Radiance was designed in close cooperation with its owners and optimized via computer calculations and model tests. The slim lines of the vessel with its 15 decks as well as the podded drive and innovative gas turbine system combine to deliver exceptional maneuvering and sea-keeping characteristics, and extremely low sound and vibration levels.

Equipped with a total of 1,050 passenger cabins, Radiance also features 200 cabins that are furnished with an intercommunicating door by which they can be converted to 100 double cabins, which are suited for families or large groups. In addition, the ship also has 14 cabins for passengers with disabilities. These spacious cabins are specially equipped to meet the requirements of handicapped passengers.

Divided into seven fire zones, the vessel meets the rules for a two compartment vessel and is designed in accordance with the latest IMO regulations. Evacuation materials consist of four tenders, 14 lifeboats and two fast rescue boats. The vessel is also equipped with two so-called Marine Evacuation Systems, which enable a quick evacuation via chutes onto the life rafts.

The ship's bridge area is outfitted with the IBS integrated bridge system by Litton Marine, which includes all components required to ensure safe navigation — even in much frequented and narrow waters. The bridge's main feature is the Voyage Management System, which allows the radar display and the electronic sea chart to be placed one above the other. All radar units have high resolution color monitors providing the navigator with advanced means of distinguishing between the different symbols used.



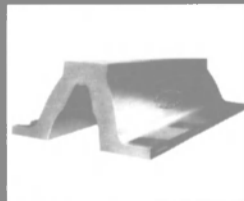
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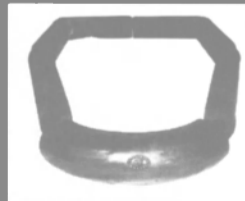
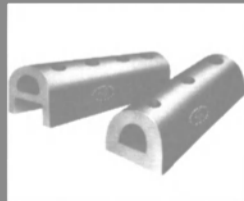
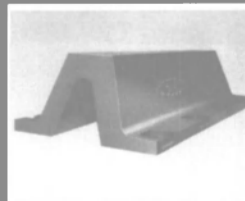
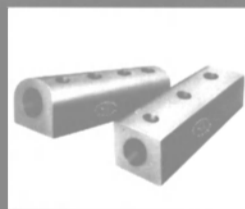
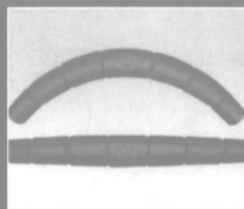
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Cruise and Ferry Products Report

Cruise Lines Equip Fleets With Emergency Smoke Hoods

Prevention and control of fire aboard ships present a number of unique problems. Special attention must be paid to fire safety, and in particular to evacuation procedures from enclosed areas that can fill quickly with the toxic fumes generated by fire. A number of cruise lines are addressing this situation by providing their crews with a type of fire safety device that protects against these potentially lethal gases.

Royal Caribbean Cruises Ltd. has joined several other major companies in the cruise industry with the decision to equip its fleet of cruise ships with EVAC-U8 Emergency Escape Smoke Hoods. These fire-safety products protect against smoke inhalation in the event of a shipboard fire.

Royal Caribbean is one of the world's largest cruise lines, operating both Royal Caribbean International and Celebrity Cruises. EVAC-U8 smoke hoods have been installed on the 12 ships operated by Royal Caribbean, along with Celebrity Cruises' five ships, for use by crew members. According to Brookdale International Systems Inc., manufacturer of the EVAC-U8, the order totaled just under 5,000 units, with deliveries taking place between May and July of 2000.

Royal Caribbean is the most recent cruise line to install this potentially life-saving technology, but it is certainly not the first. In the spring of 1999, Princess Cruise Lines deployed between 300 and 700 EVAC-U8 smoke hoods on each of the nine ships in its fleet, also for crew safety in the event of a fire emergency. Disney Cruise Lines has recently purchased EVAC-U8s for its ships as well.

Considered by many fire-safety experts to be the world's most advanced smoke hood, the EVAC-U8 is a state-of-the-art respiratory protection device that provides up to 20 minutes of breathable air in a toxic environment. About the size and shape of a beverage can, EVAC-U8 combines a state-of-the-art catalytic filter with a heat and flame-resistant hood that protects the user's head and eyes from smoke, heat and flame. This development follows a recent International Maritime Organization (IMO) recommendation that Emergency Escape Breathing Devices, or EEBDs, be installed in the engine rooms of marine vessels. In a document drafted by the IMO's Maritime Safety Committee, guidelines were established regarding "location, use and care of emergency escape breathing devices, to provide personnel breathing protection against a hazardous atmosphere while escaping to an area of safety."

Circle 67 on Reader Service Card

Laser Magic Affects The Cruise Industry

Laser Magic, a special effects installer for the cruise ship market has installed its products on a variety of high-profile vessels, namely Disney Magic and Wonder; Carnival Elation, Paradise, Victory and Spirit; and Costa Atlantica. The

company has also been commissioned to install its system onboard Carnival Glory in November 2001.

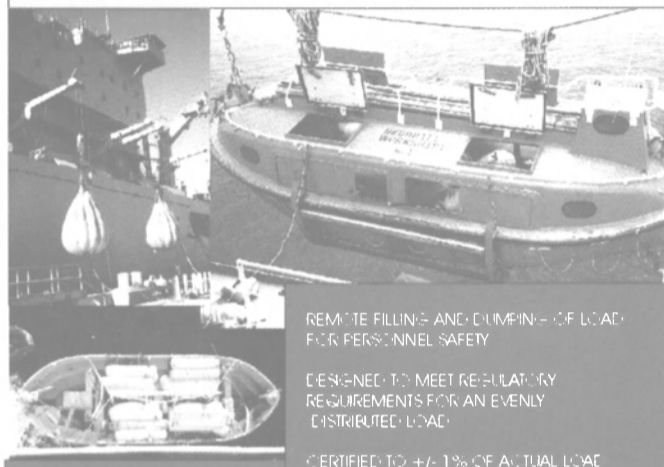
Based in the U.K., Laser Magic will be displaying its latest range of products at this year's Cruise & Ferry Show in London.

The company will show its unique

LM-PowerScan modular laser system designed to withstand the sometimes harsh conditions of the high seas. Not only powerful, these systems offer a variety of colors, effects, animations and video to raster, and video to raster images.

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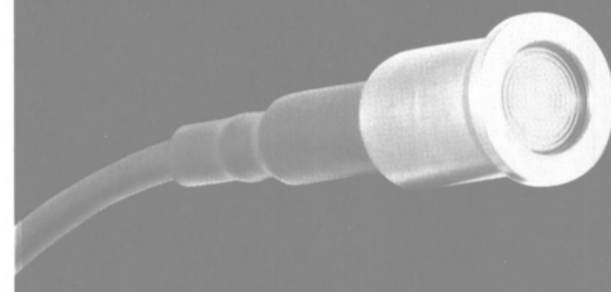
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Cruise and Ferry Report

Blount Retires From ACCL; Names Daughter As Successor

Maritime veteran Captain **Luther Blount** has done it again in terms of firsts in the maritime industry — the 84-year-old founder of American Canadian Caribbean Line (ACCL) has named his

daughter, **Nancy Blount** as president of the small ship cruise line.

Captain Blount, the founder and president of the line, which is headquartered in Warren, R.I., has retired as president of ACCL. While he will still hold the title of the line's chairman, Nancy will assume duties as president — making

her one of the few women to hold such a post in the cruise industry.

"We have had a succession in place for some time," Captain Blount said. "Over the years, Nancy has been assuming more responsibility in the operations of our cruise line. In the past year, she has increased company sales by 20 percent



Nancy Blount will succeed her father, **Luther Blount**, as head of American Canadian Caribbean Cruise Line (ACCL).

— making the year 2000 the best in our 35-year history."

Prior to her current position, Ms. Blount was corporate vice president and director of operations, a position that she assumed in 1979. Since then she has developed corporate policies and procedures, annual cruise schedules and itineraries, as well as administering personnel and operations of the company. Ms. Blount was also part of the management team, which oversaw company expansion from one to three vessels and the extension of itineraries into South America and the Caribbean.

"This cruise line has been part of my life for as long as I can remember," said Ms. Blount, who began her career with the company in 1966 holding a variety of positions from deck hand to shipyard welder for Blount Marine. "My goal is to ensure that my father's vision remain at the core of the company."

GE Marine Engines Appoints Matson As General Manager



GE Marine Engines has appointed **Karl W. Matson** as general manager, responsible for overall business leadership of GE's complete line of LM aeroderivative marine gas tur-

bines and precision gears used in military and commercial marine applications.

Prior to his current position, Matson served as the general manager of GE Aircraft Engines' (GEAE) Military Transport Engine Programs. He was responsible for military airlift transport and tanker business applications, including management of the C-5, KC-135R, KC-10 and B737 AEW&C engine programs.

Matson joined GEAE in 1985, and has held a series of project engineering, marketing and sales, and program management positions within various international and domestic engine programs.



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Häggblunds — Advanced Steering Control Systems For High Tech Cruise Ships

The trend of podded propulsion currently sweeping the cruise shipping market has demanded that support systems from cooperating suppliers be up to the demanding new tasks.

These new, efficient propulsion systems — which provide cruise ship designers tremendous flexibility in terms of space utilization — receive and process a tremendous amount of power, housing the electric motors themselves. The new pods, by their very nature, make conventional rudders unnecessary, as the pods are able to rotate 360 degrees, helping to increase maneuverability and reduce fuel costs.

For the steering of the propeller housings, most suppliers have chosen hydraulic motors from Swedish-based Häggblunds Drives, motors that have been used in many applications in marine environments since the 1960's.

Circle 62 on Reader Service Card

Jotun Launches New Vision Range

In response to the ongoing legislation designed to protect the environment,



Jotun has introduced its Vision Range Concept. With a considerable level of investment in research and development, Jotun has been one of the pioneers in creative effort to produce much needed, environmentally friendlier coatings products.

Jotun's Vision Range includes Antifouling, Waterborne, Anti abrasion Coatings and Cathodic Protection. Specifically focusing on the company's new waterborne coatings, a variety of new products now complete this WaterFine range of coatings.

Circle 54 on Reader Service Card

MAVCO Awarded Contract On Carnival Spirit

MAVCO has been granted the contract to install the audio equipment for all public areas on Carnival Cruise Lines' Carnival Spirit.

Built at Kvaerner Masa-Yards in Helsinki, Finland, the 960-ft. (292.6 m), 84,000-ton Carnival Spirit is destined to go into service from Miami on April 29.

Onboard, MAVCO is involved with designing and installing audio systems in a total of 23 venues, headed by onsite project manager, Nick Gibson.

April, 2001

Work on the project started in Turku last October, where he and his team built 56 racks within six weeks, which are now being installed on Carnival Spirit in Helsinki.

Circle 31 on Reader Service Card

Anti-Glare Solar Screens Receive LR Approval

Martek Marine Blinds' Glaregard navigation bridge solar screen has been successfully Type Approved by Lloyds Register of Shipping for installation on

sea going vessels. The solar control film is manufactured by laminating three transparent layers of anti-fade polyester. In addition, a microscopic layer of reflective aluminum is applied together with a UV filtering compound.

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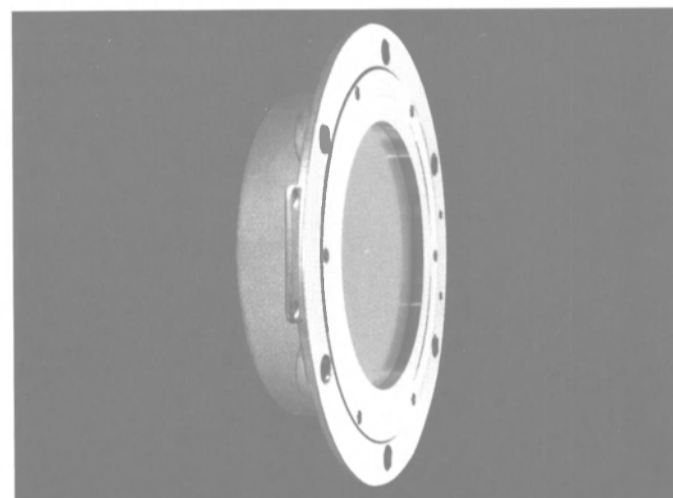
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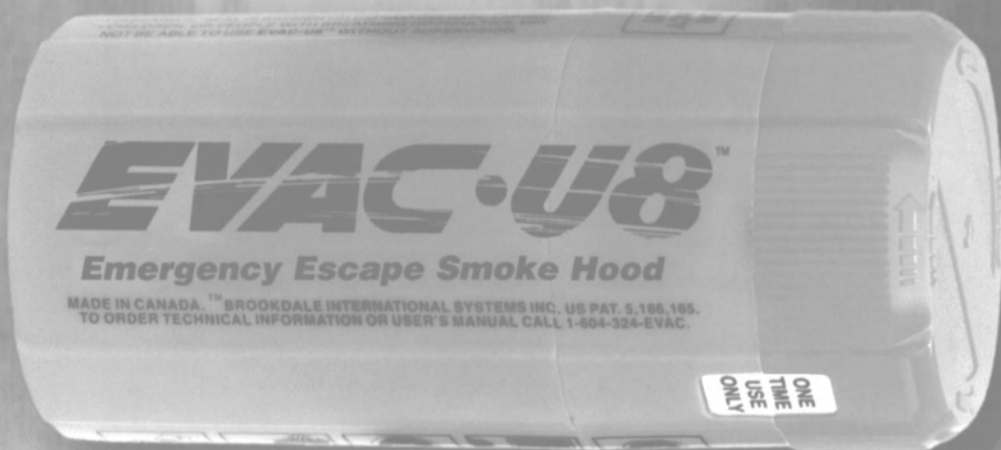
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Crystal Cruises Unveils Impressions For New Ship

Subsequent to the successful run of the line's two-ship fleet, Crystal Harmony and Symphony, Crystal Cruises unveiled plans for its third ship on March 6 at the Seatrade Cruise Shipping

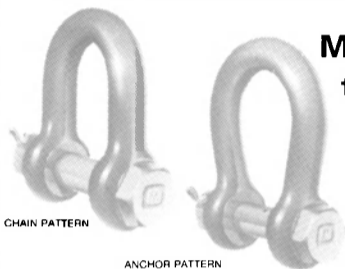
Convention. Tentatively titled Crystal Three, the vessel, will boast designs by a variety of international design firms with **Robert Tillberg** of Tillberg design as coordinating architect.

Scheduled for delivery in June 2003, the ship will be built at Chantiers de l'Atlantique, and according to Tillberg,

will be "a sister, not a twin, to the Crystal Ships.

Coordinating with Tillberg will be an array of firms, namely **Kirk Nix** of Nix Firestone Assoc.; **Garroni Designers Co.**; **Brennan Beer Gorman Monk/Interiors**; **II x IV Design Assoc.**; **Okada & Assoc.**; and **Stephenjohn Design**.

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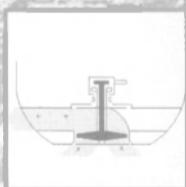
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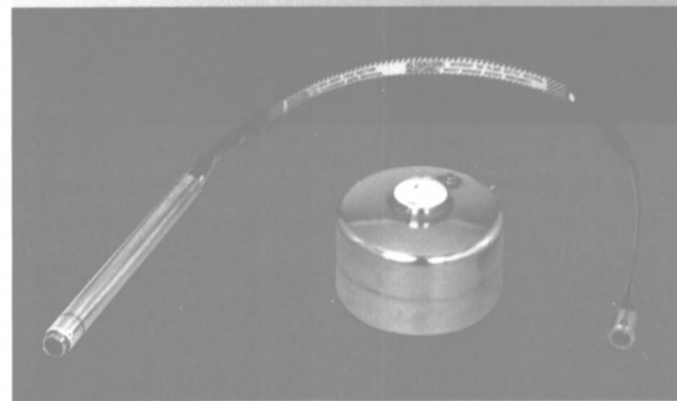
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Circle 257 on Reader Service Card

Offshore Report

The FPU Market Is Primed To Produce

by James R. McCaul, president, International Maritime Associates (IMA)

According to a study just completed by IMA, 121 floating production systems are in operation or available. This is an increase of approximately 90 percent over the number of units in operation five years ago. About one-quarter of the units are operating off Northern Europe, another quarter off Brazil and the remainder are mostly in the Gulf of Mexico, offshore China/Southeast Asia, West Africa and Australia.

Recent burst of orders for floaters

Reflecting upbeat conditions in the oil and gas sector, there has been a burst of orders for new floating production systems over the past six months. Between September 2000 and March 2001, eight production units have been ordered: four FPSO vessels, three spars and a production semi. With these new orders 27 floating production systems are now being built (see chart 1).

Chart 1: 27 Floating Production and Five Storage Systems are On Order



Source: IMA, Floating Production Study

What type floaters are being built

A noticeable shift has taken place in type production system now being built vs. five years ago. In 1996, about one-quarter of the production units on

order utilized semisubmersible hulls. Now spars comprise about one-quarter of the production units on order and only two of the 27 units currently on order are semisubmersibles. Accounting for this shift in platform is the growing popularity of spars as dry completion units and the lack of suitable semisubmersible hulls that can be used for conversion to production facilities (see chart 2).



James R. McCaul

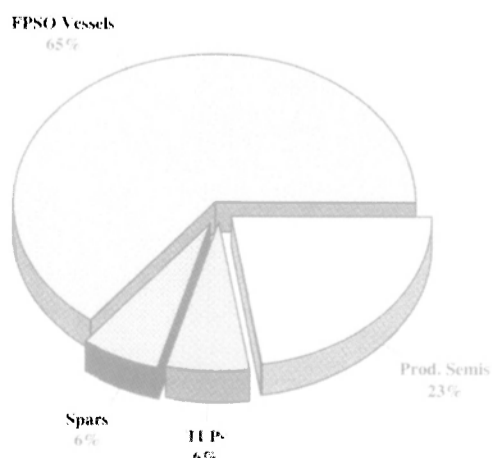
Where will they be placed?

A noticeable shift has also taken place in where these floating production systems are to be used. Almost half of the units under construction in 1996 were for fields in the North Sea and another 30 percent of the units were destined for use offshore Brazil. Now the major destination is the Gulf of Mexico, which accounts for more than one-third of the systems currently on order. Equally significant is the increased presence of West Africa as a destination for floating production systems. There are now as many systems on order for use off West Africa as for use in the North Sea (see chart 3, page 36).

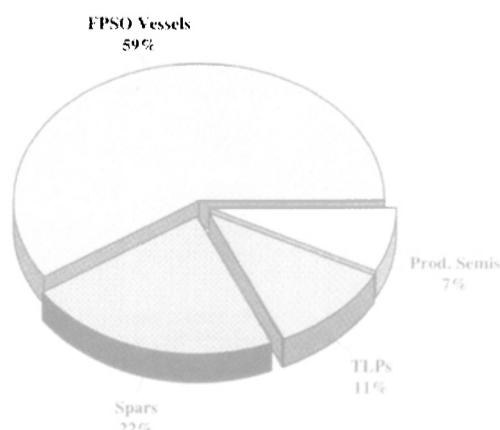
New floaters planned or under study

IMA has identified 155 offshore projects in the bidding, design or planning stage where a floating production and/or storage system is being considered as a development solution. Projects off West Africa account for 26 percent of these planned projects and the Gulf of Mexico accounts for another 22 percent. There has been a significant drop in number of projects planned in the North Sea vs. five years ago, reflecting the downturn in new activ-

Chart 2: Types of Floating Production Units on Order
September 1996

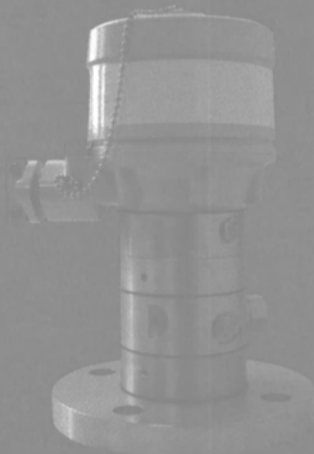


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Source: IMA, Floating Production Study

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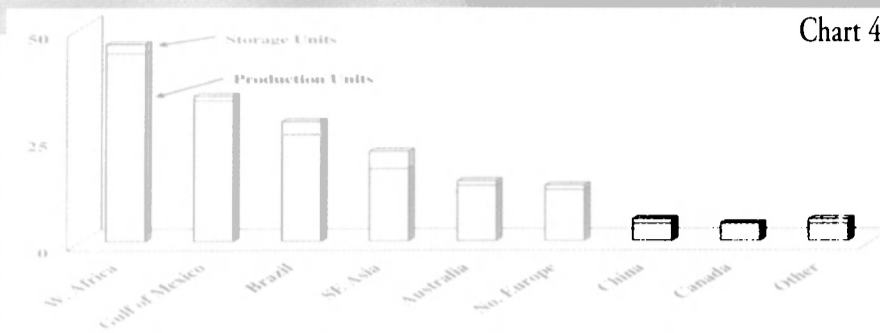
Offshore Report

activity in the North Sea (see chart 4).

Future equipment orders

Over the next five years, we are projecting orders for an average of 13 to 17 production floaters annually. FPSO vessels will clearly be the predominant type

(Continued on next page)



What Type of Floater Will Be Used?

- **Offshore West Africa** the most likely solution will be use of non-weathering FPSOs tied to subsea wells. Purpose-built units will be ordered for big fields such as Rosa, converted hulls for smaller fields. On very large fields, a spar or TLP will be considered for use as a production hub, but the local partner will likely push for the least cost up front solution, which leans toward selecting FPSOs with subsea completion.

- **In the Gulf of Mexico**, spars, mini-TLPs or production semis will be the likely production solution on fields where they can be tied to the existing pipeline infrastructure. Operators in the Gulf like to minimize operational cost by utilizing surface trees, a capability of spars, making this production option attractive. Weathering FPSO vessels will be a potential solution in the ultra-deepwater central and western areas distant from pipeline infrastructure, with shuttle tankers used to deliver crude to the refineries along the Gulf Coast.

- **Offshore Brazil**, Petrobras will undoubtedly lean toward FPSOs (based on converted hulls) tied to subsea wellhead facilities in order to minimize capex. Existing production semis will be moved around as fields close, but there will be probably no additional semis acquired, unless a semi hull of opportunity emerges. Oil majors operating offshore Brazil may be willing to incur the added capex of spars or TLPs to enable use of surface trees in order to minimize well maintenance cost.

- **FPSO vessels** (mostly weathering) will be the likely solution offshore China, Southeast Asia and Australia. Purpose built units will be selected for large fields with long life expectancy, particularly off China and Australia. Hulls for offshore China will likely be local built. Converted hulls will be more likely to be used off Southeast Asia. North Sea production units will be mostly weathering FPSO vessels (some purpose-built, some based on converted hulls), with a possible TLP or spar on larger fields. Units now on station will be moved around.



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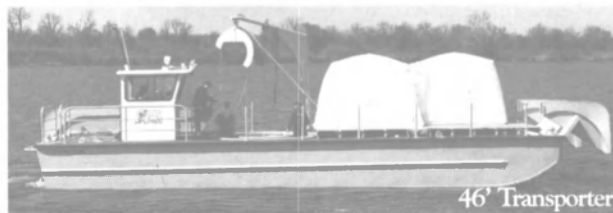
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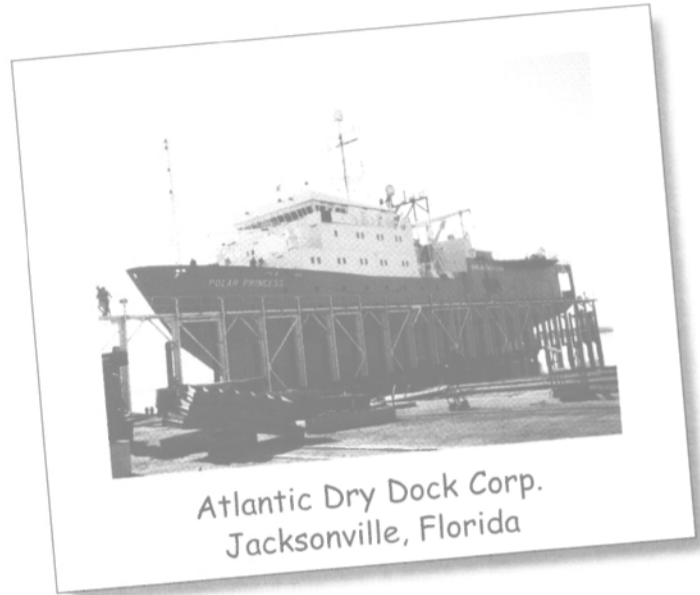
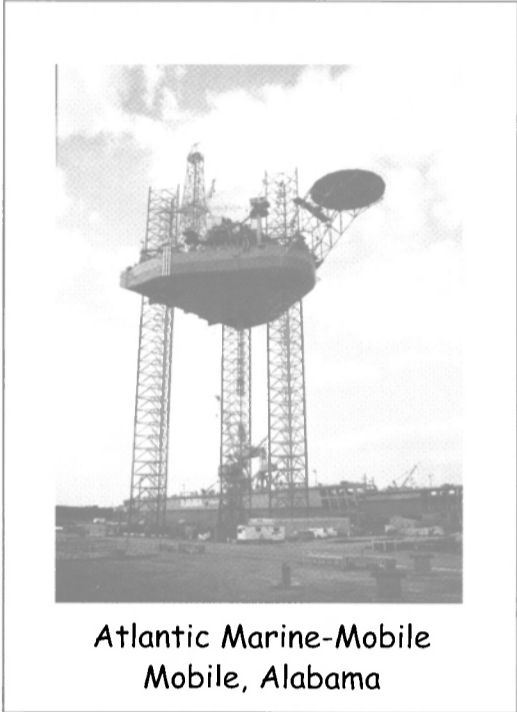
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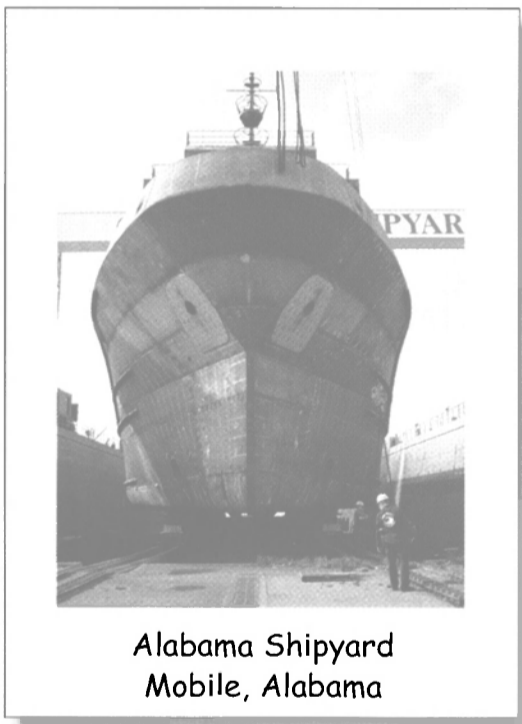
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Offshore Report

of production unit, accounting for more than two-thirds of the units to be constructed. These units have the advantage of large process plant carrying capacity, storage capability, wide availability of secondhand tanker hulls, low prices on new hulls from Asian yards and relatively easy relocation from field to field.

Production spars will be the second favored production solution. They are particularly suited to deepwater, mid-sized fields that have access to pipeline infrastructure. A particular advantage of spars is their ability to accommodate dry trees, a major feature on fields with high paraffin content. TLPs, particular-

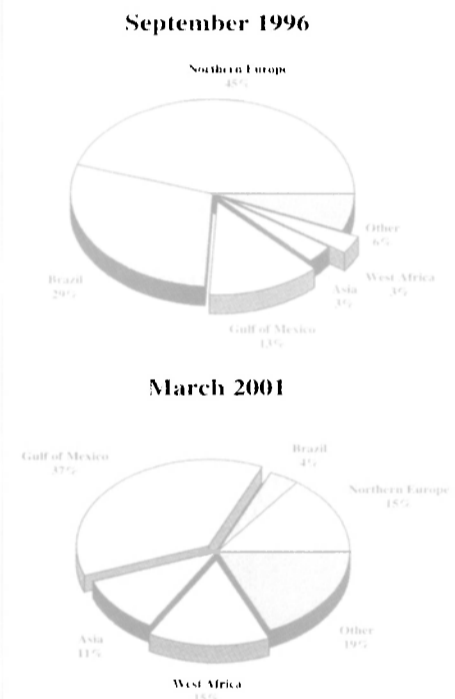
ly the mini version, and production semis will make up the remainder of orders (see box 1, previous page).

Orders for shuttle tankers — A number of fields in the ultra-deepwater sector of the Gulf of Mexico are not within the economic reach of the existing pipeline infrastructure and shuttle

tankers will be the only option for transporting produced crude to U.S. refineries. These vessels will likely be Aframax size, fitted with dynamic positioning capability and priced in the area of \$100 million. We expect the first orders for Gulf of Mexico shuttle tankers to be placed within the next 12 to 24 months, providing an interesting source of business for shipbuilders and equipment suppliers.

This article is an excerpt from IMA series of studies on floating production systems. The full series is available for \$1,400. A description of the floating production series, as well as a description of our new report on Gulf of Mexico shuttle tankers, is available on our website at www.imastudies.com.

Chart 3: Shift in Geographic Locale of FPU Use



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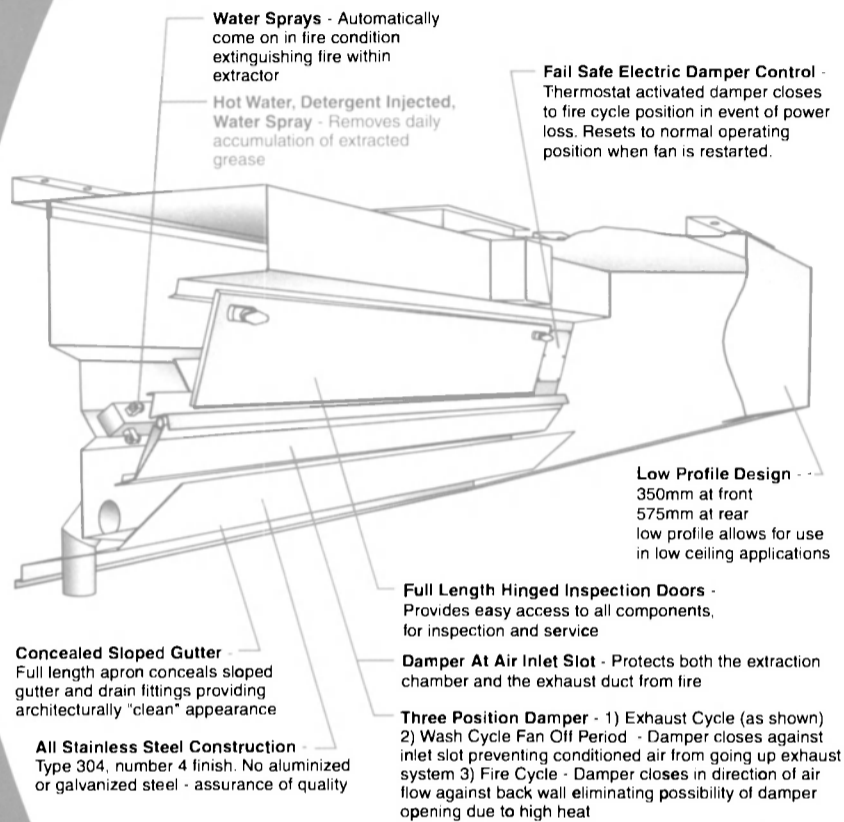
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Seafloor Processing Technology Project Launched

ABB, BP, Chevron and Kvaerner signed an alliance agreement to perform a collaborative study designed to address the challenges associated with advancing seafloor processing technology for deepwater oil and gas reserves. The group will analyze how to develop standardized, modular, compact and remotely operated facilities that would sit on the seafloor and could reduce the operating difficulties, costs and environmental impacts of deep-sea production. It is anticipated that the result of the study will yield the following benefits:

- New cost effective production facilities that are removable and will have parts that can be reused or recycled;
- Increased oil recovery over traditional field development options such as floating production storage offloading;
- Spin off technologies in the area of oil and gas treatment that could improve the operation of conventional facilities.

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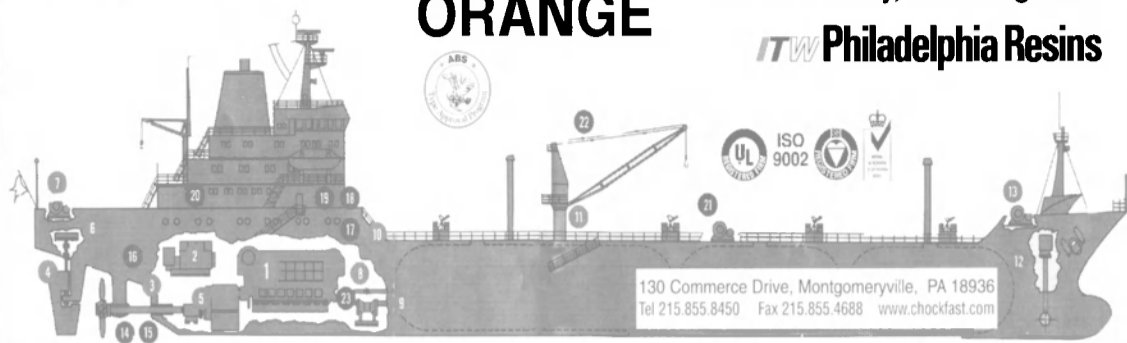
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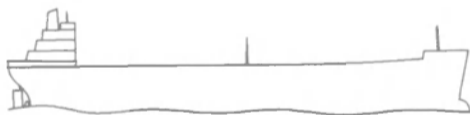
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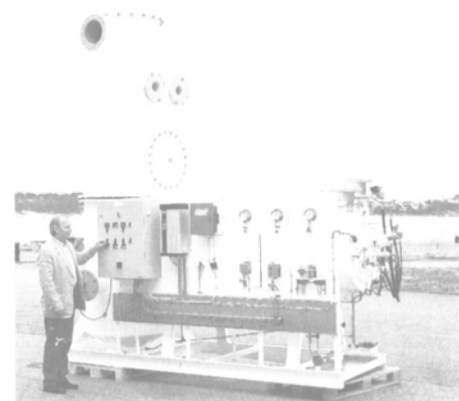
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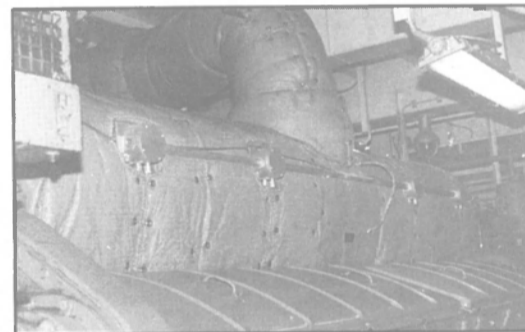


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Ifremer Sets ROV Depth Record

The French National Institute for Maritime Research (Ifremer) reportedly set a world's record with its Victor 6000 ROV

remotely operated undersea vehicle recently, covering almost seven miles of ocean floor in a single dive at depths over 16,000 ft., or more than three miles below the ocean's surface. The dive was

achieved during a 45-day cruise aboard Ifremer's research vessel, Atalante, off the coast of Zaire, West Africa. The dive was carried out in partnership with TotalFinaElf as part of the Zaiango pro-

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gram, the exploration of this immense submarine valley that extends for more than 600 miles.

CWWS Delivers 200 Separators To Tidewater

Tidewater Marine L.L.C. has put new muscle behind its commitment to protecting the environment with a decision to extend a program of bilge water treatment to virtually its entire fleet. Heli-Sep Oily Water Separators manufactured by Coffin World Water Systems LLC (CWWS) are helping the company accomplish its goal.

Heli-Sep units are already used on the larger vessels in Tidewater's fleet that are subject to the 15 ppm oil discharge limit mandated by IMO MEPC. 60(33). In addition, the company has now acted to install oily water separators onboard even its smaller workboats, which are legally exempt from that regulation. The value of the total purchase agreement is in excess of \$500,000. Lee Engineering of New Orleans is the agent for CWWS in this transaction.

E. J. Hebert, vice president of Engineering for Tidewater Marine, said, "We believe it is important for Tidewater to set an example for proactive environmental initiatives, instead of waiting for broader regulation."

Heli-Sep oily water separators are equipped with a self-cleaning polishing pack and a permanent coalescing matrix that eliminates the need to replace filters. Each unit is shipped pre-piped and pre-wired to simplify installation. With more than 6,000 units in service worldwide, Heli-Sep design has proven performance in meeting global discharge standards reliably and cost-effectively. CWWS offers a series of models with capacities ranging from 0.5 to 10 cu. m./hr. (2.2 to 44 gpm), which can accommodate the full range of shipboard needs.

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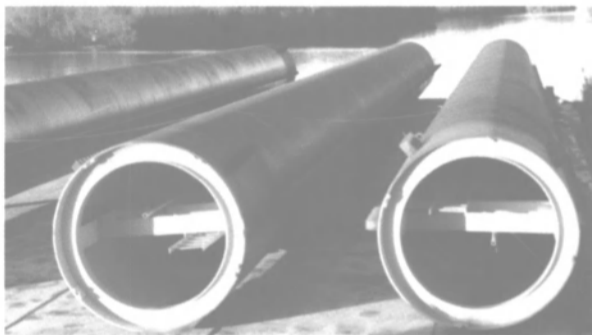


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Offshore Report: Cover Story

A Leg Up on the Competition

To Tim Domke, the new M/V Dixie Legacy (pictured on the cover), is much more than simply the largest, most advanced lift boat in the world. To Domke, the Dixie Legacy is personal, the culmination of a career built sailing onboard these unique vessels with the last four years spent shoreside, overseeing the construction activities at Semco Shipyard for



Dixie Legacy's legs are 8.5 ft. in diameter.

Power Offshore Service of Belle Chasse, La.

Semco recently completed a 250-ft. (76.2 m) leg lift boat for Power Offshore Service, the first in a series of lift boats under construction for the company. Dixie Legacy features a number of technical innovations and amenities that should secure its profitable and successful future for many years to come.

While the vessel offers many innovations both seen and hidden, its greatest assets are immediately evident upon first laying eyes on the boat: its cranes, its deck area and its legs.

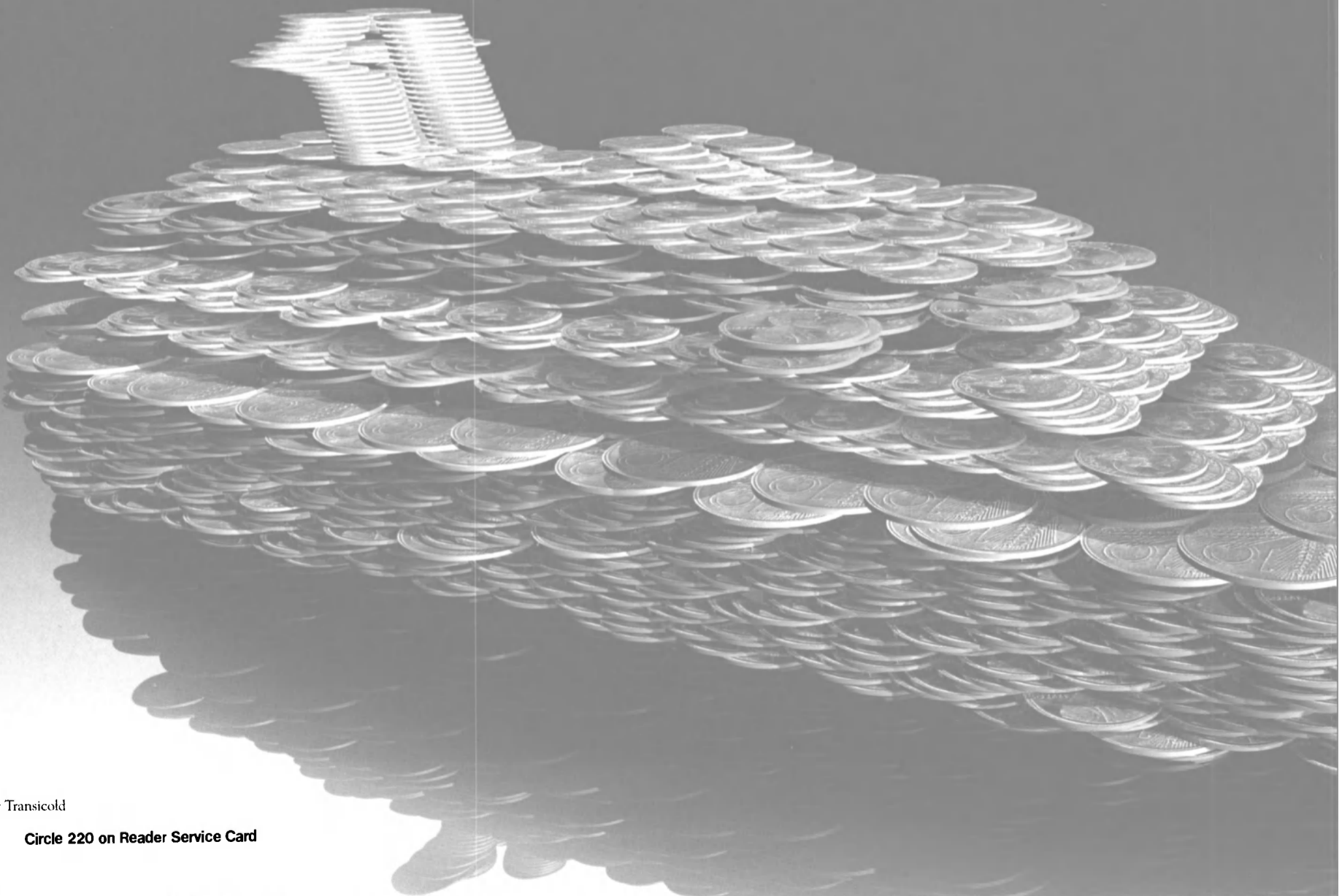
Dixie Legacy — measuring 225 x 103 ft. (68.5 x 31.4 m) — is the first vessel of its kind to be equipped with two Seatrax Model LM 10520 marine cranes, one mounted on each of the vessel's forward leg support structures. Each crane is rated to lift 175 tons (although if stationed shoreside, that rating would likely jump to about 250 tons) and is equipped with a 120 ft. boom. The unique mounting arrangement allows each crane to rotate 360 degrees, a feature which

This massive, 175-ton capacity Seatrax crane is just one of two featured aboard the new Dixie Legacy.

Domke said significantly enhances the vessels lifting capability and flexibility.

The vessel's main deck space compliments the tremendous lift capacity by offering a monstrous 8,200-sq.-ft. of usable work area, an area that in total measures about 10,000 sq. ft. Dixie Legacy will have a variable deck load up to 750 Kips, while Dixie Endeavor, its sister vessel due for delivery in December 2001, will have a variable deck load capability up to 1,500 Kips.

Finally, Dixie Legacy's legs make it unique as, with zero sea floor penetration, the vessel can operate in 180 ft. of water with 40 ft. of clearance above the surface. Each leg is 8.5 ft. (2.5 m) in diameter and 250 ft. (76.2 m) long. Due to the legs' extra long length, the interior support structure is similarly reinforced to ensure the long-term structural integrity. To ensure the vessel's efficiency in operation, Domke notes that Hydra Craft Pumps from Rolls-Royce are used to power the jacking system, enabling that the vessel gets up and down





smoothly and efficiently, via the simplicity of a variable speed joystick control. In addition, each leg is equipped with a jetting system, and each will also be outfitted with water infiltration alarms.

Behind Closed Doors

While the essence of the vessel as an asset in the oil fields is embodied by the capabilities mentioned above, the soul of the vessel is evident in the detail demanded by Domke and crew. Dixie Legacy will be used as a support platform from which various oil and gas industry activities can be performed, activities such as coiled tubing, hydraulic snubbing, nitrogen stimulation, drilling, plug and abandonment, construction, facility installation or removal and diving.

Able to accommodate 50 and feed 36 at one time, Domke notes that the vessel houses a real community, a community of individuals that increasingly demands evident and subconscious amenities that are designed to make the vessel appealing and productive. For example, flooring of all "wet" (pantry, bathrooms,

Dixie Legacy's wheelhouse is state-of-the-art, boasting a full complement of mostly JRC marine electronics. Frank L. Beier coordinated.

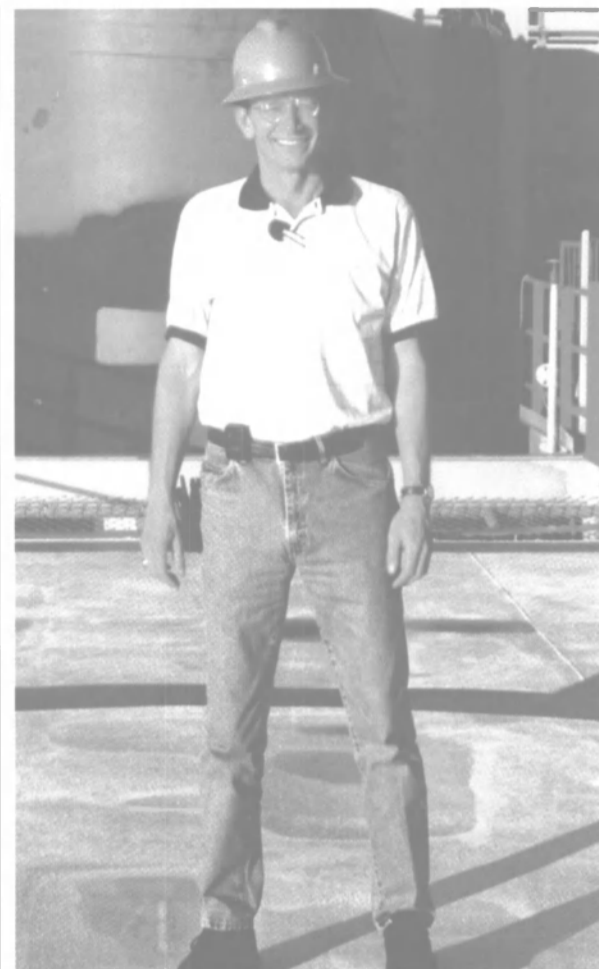
bath, laundry, etc.) areas is poured epoxy resin instead of tile. He notes that tile is more apt to come up over time, presenting a situation, which is not only aesthetically unappealing, but relatively labor intensive to replace, whereas the epoxy resin floor is considered more durable and can be repaired easily and quickly.

In the galley, the owner decided to use freestanding Cospolich freezers and refrigerators rather than the walk in freezers previously chosen. Domke noted that the walk-in units have the tendency to rot out after 12 to 14 years, and can pose quite a challenge to replace and/or repair.

In the accommodation areas, red oak furniture was selected to give off a more modern look, and privacy curtains are supplied for all berths in multi-berth rooms. In addition, wood lockers were chosen over cheaper metal models, to reduce rattling. To access the accommodation areas from the outside, workers must come through an outer door, a vestibule and an inner door, so that blasts of hot, moist air are avoided on these decks.

Power to Burn

The main propulsion is provided by four Cat 3508 DITA-B Rating, 960 hp @ 1,800 rpm each, for a cumulative 3,840 total hp. The engines are driven through Twin Disc MG 540 reverse reduction marine gears (6.18:1 reduction). Dixie Legacy has one SMI Model



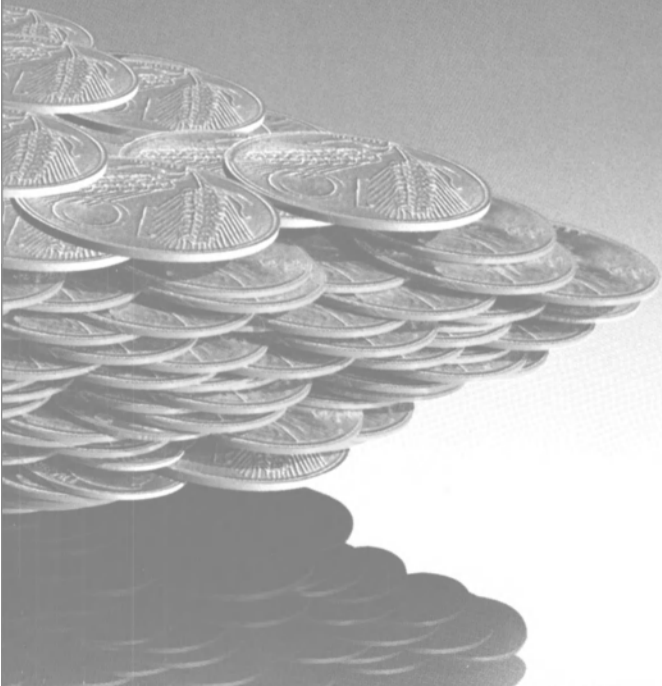
Tim Domke ensures that Dixie Legacy, from top to bottom, inside and out, is delivered to the owner's demanding specs.

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Offshore Report

500 bowthruster, rated 500 hp @ 1,200 rpm. The four-engine installation provides superior power for propulsion and increased maneuvering and positioning, by virtue of generous distances between outboard propellers. The two engines used for main propulsion are keelbox cooled, while the two jacking engines are radiator cooled.

Redundant 425 kW Cat 3412 DITA generators and one 190 kW Cat 3306 DITA emergency generator provide electrical power.

Both Dixie Legacy and Dixie Endeavor are USCG Subchapter "L" — ABS classed Self-Elevating Lift Boats, AMS, International Tonnage — International Load Line - Zero pollution, satisfy ABS

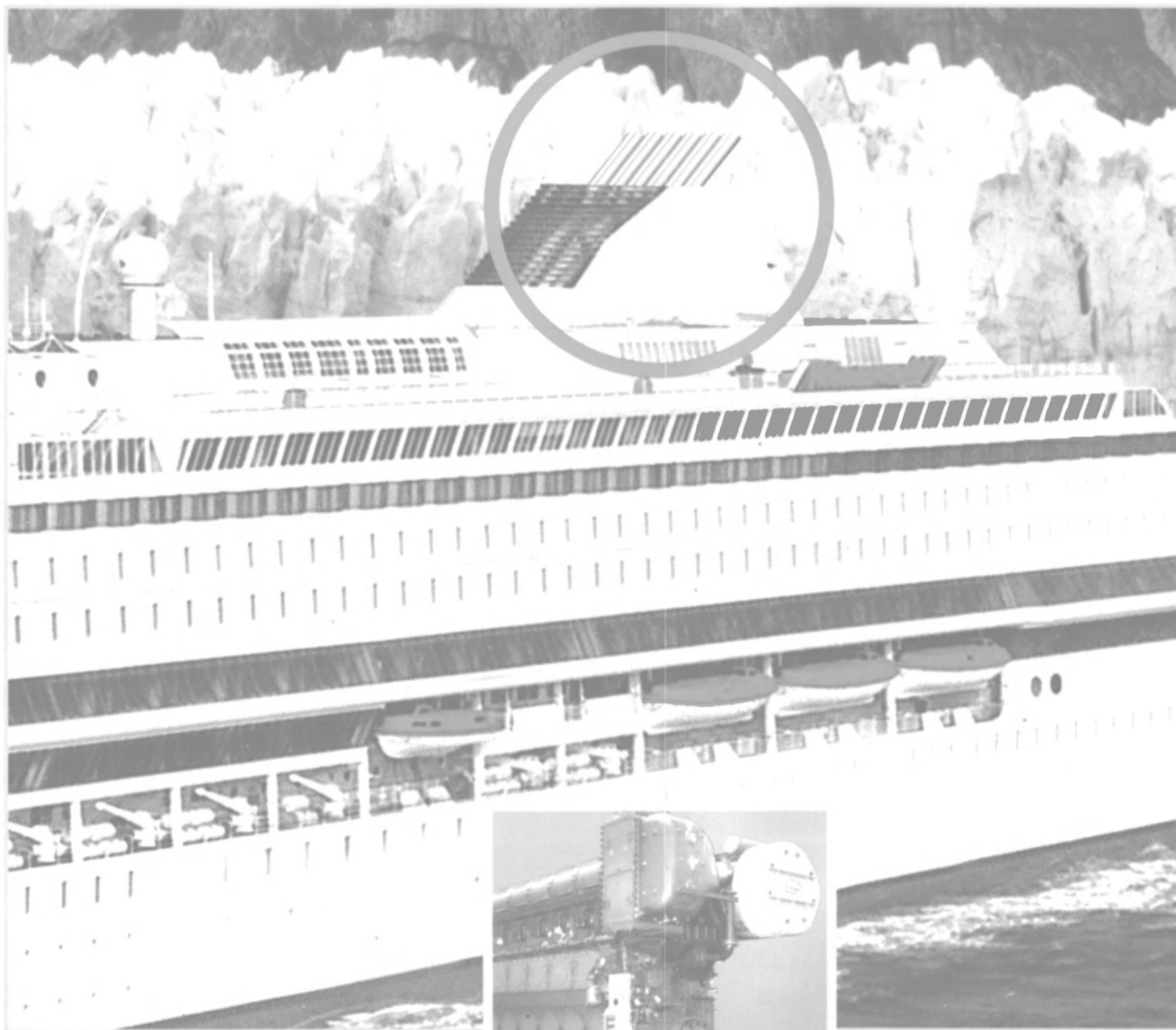
and IMO requirements and are SOLAS ready.

The vessel is well-outfitted on the bridge with the top level of marine electronics and safety equipment, including GMDSS, fire detection and smoke alarm throughout, and nearly a full complement of JRC equipment, including JRC radar, GPS and VHF. It also features a

Furuno FCV 667 depth finder with three transducers, located port and starboard legs forward, as well as center below the engine room. This allows the captain, while running on the river, to switch from one transducer to the other and ensure that the vessel does not run up onto the bank. Domke said the owner is currently evaluating satellite communication service providers and will soon hook up the Dixie Legacy, helping to integrate it with the other eight vessels in the fleet and the home office.



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MAN B&W Diesel Inc., 17 State Street, 18th Floor, New York, NY 10004, Tel. (212) 269-0980



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Dixie Legacy Specifications

Builder	Semco
Designer	Semco
Owner	Power Offshore Services
Mission	Multi-Purpose
Length	225 ft. (68.5 m)
Beam	103 ft. (31.4 m)
Depth	13 ft. (4 m)
Main Engines	Caterpillar
Ships Service Power	Caterpillar
Marine Gear	Twin Disc
Propellers	Ships Machinery Inc. (SMI)
Electronics	Frank L. Beier
Controls	MEC Electronic Controls System
Cranes	Seatrax
Thruster engines	SMI Model 500 bowthruster
Steering system	EMI Electro/Hydraulic System
Speed	7 knots
Hull Construction	Steel
Crew & Passenger	50
Fuel capacity	29,340 gal.
Water capacity	29,000 gal.
Lube oil capacity	935 gal.
Hydraulic oil capacity	5,000 gal.
Waste oil capacity	1,975 gal.

Chevron To Spend \$6B In 2001

Chevron announced a \$6 billion capital and exploratory spending program for 2001, planning to invest \$3.7 billion in worldwide exploration and production, and \$1.2 billion in the United States. "The 2001 capital and exploratory program is an increase of approximately 16 percent over our 2000 program," said **Dave O'Reilly**, Chairman and CEO.

Worldwide, Chevron continues to target 4 to 4.5 percent annual barrel of oil equivalent volume growth from 199 levels. Chevron's third Gulf of Mexico deepwater development project, Typhoon, is on schedule for a mid-2001 start up. In West Africa, development of Block 0 and the deepwater Block 14 in Angola will continue.

Chevron's capital program includes exploratory drilling programs in Angola, Brazil, Azerbaijan, Norway and deepwater Gulf of Mexico. Exploratory drilling will continue in Angola on Block 14. In Brazil, drilling will begin on two offshore blocks acquired in 2000. Seismic work will begin on the newly acquired deepwater lease (OPL 250) in Nigeria and two additional blocks in Brazil. Chevron intends to participate in an exploration drilling program in Alaska and is funding drilling offshore Canada's east coast and in the Mackenzie Delta.

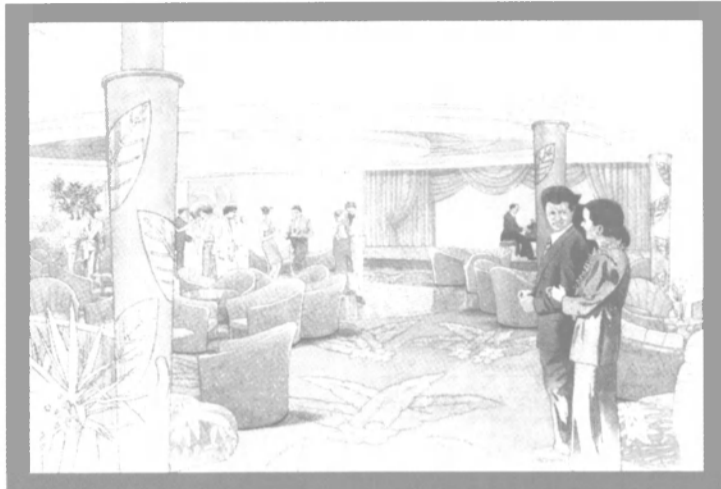
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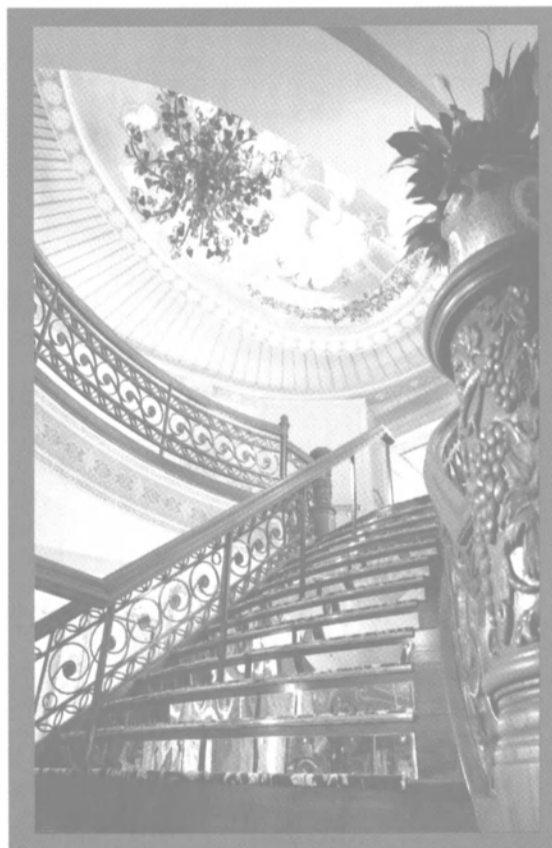
(AMCV Cabaret Lounge Drawing Courtesy of American Classic Voyages Co.)



(Showboat Casino)



(Commercial Galley)



(Photo courtesy of The Delta Queen Steamboat Co.)



(Blue Chip Casino)



(Seamar OSV Stateroom)



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Seacor Continues Rational Fleet Expansion

Seacor — through an unprecedented string of strategic and financially sound acquisitions — has emerged as one of the world's premier operators of a fleet of vessels that provide marine services

to the oil and gas exploration and production industry, and oil spill response services in the U.S. Gulf of Mexico, North Sea, offshore West Africa, the Far East and Latin America. For the fiscal

year ended December 31, 2000, the company announced net earnings of \$11.1 million on revenues of \$88.3 million. For the 12 months ended December 31, 2000, net earnings were \$34.1 mil-

lion on revenues of \$339.9 million. The improvement in the fourth quarter offshore marine results was led by a 10.3 percent increase in operating revenues due primarily to higher rates per day worked for vessels operating in the U.S. Gulf of Mexico and in West Africa and higher overall utilization for all vessel

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Seacor Smit Inc. and Subsidiaries

Condensed Consolidated Statements of Operations
(in thousands, except share data, unaudited)

	Three Months End		Twelve Months End	
	December 31,		December 31,	
	2000	1999	2000	1999
Operating Revenues	\$88,301	\$71,335	\$339,941	\$289,425
Costs and Expenses:				
Operating expenses	50,931	41,826	201,452	166,786
Administrative and gen.	10,303	9,484	39,548	34,744
Dep. and amortization	12,418	11,380	51,189	41,282
Operating Income	14,649	8,645	47,752	46,613
Gain (loss) from equipment sales, net	696	(130)	7,628	1,677

Segment Results (in thousands, unaudited)

	Three Months End		Twelve Months End	
	December 31,		December 31,	
	2000	1999	2000	1999
Operating Revenues:				
Offshore Marine	\$79,818	\$60,139	\$276,931	\$258,329
Drilling(2)	-	4,773	37,380	7,651
Environmental	7,871	6,468	24,996	22,820
Other	784	-	1,092	938
Intersegment	(172)	(45)	(458)	(313)
Total	\$88,301	\$71,335	\$339,941	\$289,425
Operating Margin(1):				
Offshore Marine	\$32,462	\$22,992	\$102,449	\$103,758
Drilling(2)	-	2,410	21,681	3,219
Environmental	4,703	4,110	14,050	15,087
Other	205	(3)	309	575
Total	\$37,370	\$29,509	\$138,489	\$122,639

(1) Excludes administrative, general, depreciation and amortization expenses.

(2) As a result of the Chiles IPO in September 2000, Seacor's ownership interest in Chiles was reduced to below 50%. As a consequence, SEACOR no longer consolidates Chiles' operations but accounts for its reduced interest in Chiles using the equity method.

Offshore Marine Fleet

Operating Statistics

	Three Months End		Twelve Months End	
	December 31,		December 31,	
	2000	1999	2000	1999
Rates per Day Worked - Worldwide (\$):				
Supply and Towing Supply	5,945	4,770	5,163	5,432
AHTS	12,145	11,446	11,410	11,869
Crew	2,841	2,444	2,645	2,493
Standby Safety	5,133	6,009	5,328	6,045
Utility and Line Handling	1,680	1,640	1,645	1,691
Geophysical, Freight, Other	4,815	5,895	5,341	5,576
Overall Utilization - Worldwide (%):				
Supply and Towing Supply	87.4	67.8	74.7	69.9
AHTS	75.1	64.6	70.7	73.5
Crew	95.1	91.3	94.3	83.0
Standby Safety	86.2	58.8	79.1	74.1
Utility and Line Handling	52.4	59.4	57.1	65.9
Geophysical, Freight, Other	100.0	50.0	60.4	55.7

Fleet Composition at Period End:

Supply and Towing Supply	75	80
Anchor Handling Towing Supply	27	30
Crew	90	81
Standby Safety	37	19
Utility and Line Handling	73	81
Geophysical, Freight, and Other	3	3
Total Offshore Marine Fleet	305	294

Fleet Composition at Period End

Supply and Towing Supply	75	80
Anchor Handling Towing Supply	27	30
Crew	90	81
Standby Safety	37	19
Utility and Line Handling	73	81
Geophysical, Freight, and Other	3	3
Total Offshore Marine Fleet	305	294

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classes except utility. Offshore marine operating expenses were essentially unchanged between quarters as higher wage and benefit costs were offset by lower repair and maintenance expense. During the fourth quarter, the Company completed 19 drydockings for a cost of \$1.4 million as compared to 30 drydockings in the third quarter for a cost of \$3.059 million. In the fourth quarter, Seacor purchased three towing supply vessels and took delivery of a newly constructed Fast Support Intervention Vessel. The company also purchased a 25 percent minority interest in the Seacor Vision, a 1997 built, 12,240-bhp, anchor handling towing supply vessel, previously held by a partner. Vessel dispositions during the quarter included four supply, two standby safety, and one anchor handling towing supply vessel. Two supply and one anchor handling towing supply vessel were leased back, and four supply vessels were redelivered to a leasing company. In December 2000, Seacor entered into a 50/50 joint venture with Penguin Boat International Ltd. of Singapore. The joint venture owns seven newly constructed Fast Support Intervention Vessels that currently operate in Southeast Asia. Penguin built six of the seven joint venture vessels in the last three years. Also in the fourth quarter, the company's joint venture in Mexico terminated the charter-in of one anchor handling towing supply vessel and a pooling arrangement with respect to four standby safety vessels was terminated. In the fourth quarter, the company expanded its inland barge business with the acquisition of SCF Corporation and related companies, which owns and operates inland river barges and that was substantially owned and controlled by certain Seacor directors. Seacor now owns 66 barges and a 50 percent interest in a partnership that owns 11 barges and manages 204 barges for third parties. Subsequent to year-end, Seacor committed to the construction of an additional 60 barges. The Company expects a certain number of these barges to be purchased by third parties and managed by SCF.

So far this year, the company has acquired six mini-supply vessels and two supply vessels, and signed a definitive agreement to acquire Gilbert Cheramie Boats, Inc. and related companies. The Cheramie companies own 14 mini-supply vessels (half of which were delivered within the last five years), eight utility vessels, and one newly constructed supply vessel. A Cheramie company has another supply vessel under construction with delivery scheduled in April 2001. Other 2001 transactions include the sale of one utility and one crew vessel and the termination of the charter-in of a supply vessel.

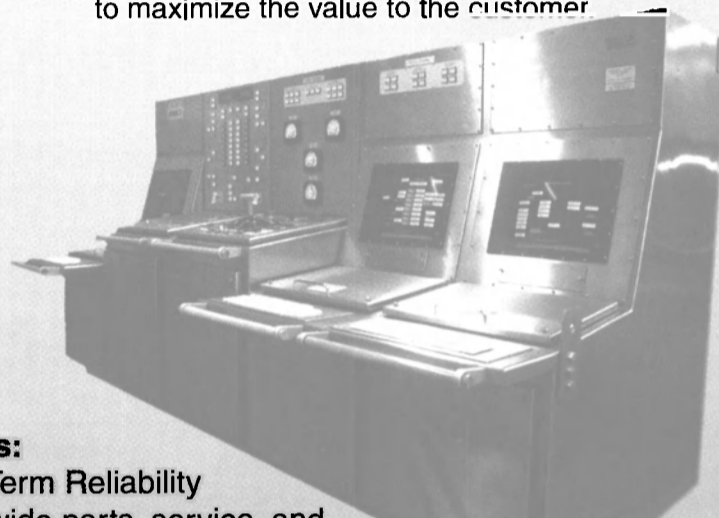
Recently Seacor Marine, Houston, awarded Bollinger Shipyards a contract to build two 145.5 ft. (44.3 m) supply/utility vessels. Construction will commence at Bollinger's Lockport, La. facility in April and May, with delivery of the vessels scheduled for November and December 2001. Yet-to-be-named, each vessel will measure 145.5 ft. (44.3

m) with a 36 ft. (10.9 m) beam and maximum drafts of 10 ft. (3 m). They will be powered by two Cummins diesel engines developing a total of 1,500 bhp at 1,600 rpm, driving Bollinger 72-in. x 57-in. stainless steel propellers through Twin Disc reverse/reduction gears. Each vessel will boast 2,800 sq. ft. of aft deck space with a maximum deck load of 390

tons, as well as four mud tanks with a total capacity of 50,000 gallons of liquid drilling muds. Navigation and communications equipment onboard will be comprised of two JRC radars; Furuno GPS; Comnav autopilot; Furuno radio; Standard Horizon Intrepid VHF radios with two remotes; and one Loudhailer with exterior hailer horns.



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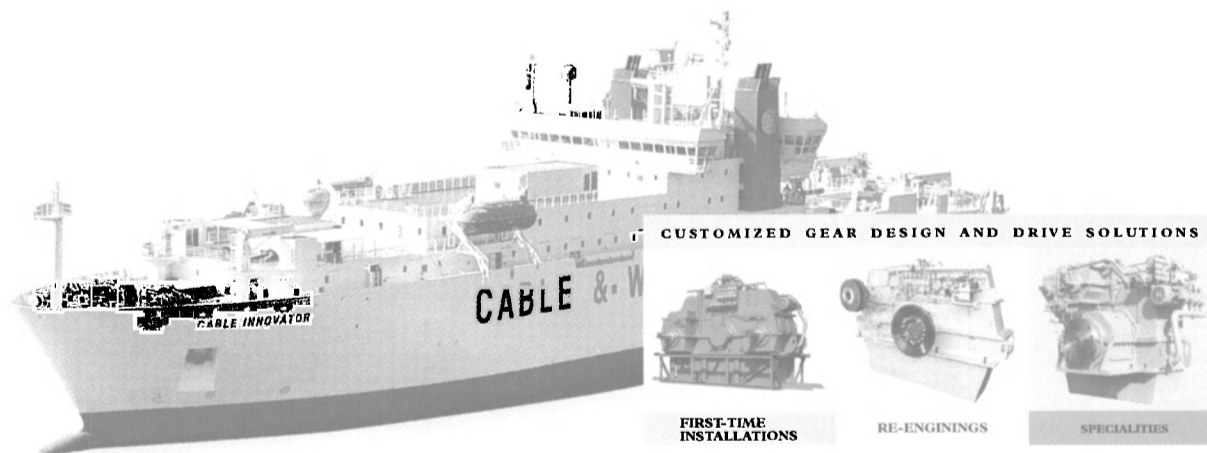
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Offshore Report

GLM Poised For A Strong 2001

Global Marine (GLM) is a holding company that provides offshore contract drilling services on a dayrate basis and offshore drilling management services on a dayrate or fixed-price basis. The

company has an active fleet of 31 mobile offshore drilling rigs and two ultra deep-water drillships under construction. The company also participates in offshore oil and gas exploration and

development projects: operations conducted mainly in the U.S., the U.K., Nigeria, Canada and other countries abroad. Contract drilling accounted for 64 percent of 1999 revenues; drilling

management services 35 percent and oil and gas, one percent.

On January 18 the company reported net income for the year ended December 31, 2000, of \$113.9 million on revenues of \$1 billion. This compares to net income of \$89.5 million on revenues of \$791 million for the year ended December 31, 1999. For the quarter ended December 31, 2000, the company reported net income of \$40.9 million on revenues of \$332 million, as compared to net income of \$10.7 million on revenues of \$199 million for the same quarter of 1999.

Global Marine chairman, president and CEO **Bob Rose** said, "Our industry had an eventful year in 2000 as oil and gas prices soared and exploration and production companies stepped up their drilling programs. During 2000, worldwide offshore rig utilization increased to 82 percent from a year-end 1999 level of 72 percent. In the Gulf of Mexico, utilization of jackup rigs approached 90 percent, and dayrates for most classes of these rigs more than doubled." At Global Marine, seven rigs that had been idled for lack of work returned to service during 2000, and two new ultradeep-water, dynamically-positioned drillships began earning dayrate. By year-end 2000, Global Marine's rig utilization rate had increased to 91 percent from 71 percent at the beginning of the year, and the two remaining idle semisubmersible rigs were preparing to begin operations in the first quarter of 2001.

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Global Marine Inc. & Subsidiaries

Condensed Consolidated Statement of Income

(In millions, except per share amounts)

	Three Months End		Twelve Months End	
	December 31, 2000	December 31, 1999	December 31, 2000	December 31, 1999
Revenues:				
Contract drilling	\$171.3	\$103.1	\$584.1	\$507.7
Drilling management	154.5	92.4	435.6	275.0
Oil and gas	6.6	3.2	20.1	8.3
Total revenues	332.4	198.7	1,039.8	791.0
Expenses:				
Contract drilling	82.7	63.9	299.3	271.1
Drilling management	152.4	86.2	413.8	261.5
Oil and gas	1.1	0.6	3.4	2.7
Dep., depletion, and amortization	29.4	23.1	107.0	88.8
Restructure costs	-	-	5.2	-
General and administrative	4.9	6.4	22.6	23.6
Total operating expenses	270.5	180.2	851.3	647.7
Operating income	61.9	18.5	188.5	143.3

Results of Operations by Business Segment

(Dollars in millions, except for average dayrate)

	Three Months End		Twelve Months End	
	December 31, 2000	December 31, 1999	December 31, 2000	December 31, 1999
Revenues:				
Contract drilling	\$172	\$106.9	\$589.2	\$517.7
Drilling management	156.7	93.6	445.6	282.2
Oil and gas	6.6	3.2	20.1	8.3
Elimination	(2.9)	(5.0)	(15.1)	(17.2)
Total revenues	\$332.4	\$198.7	\$1,039.8	\$791.0
Average rig utilization rate	90%	70%	84%	76%
Average dayrate	\$63,900	\$53,000	\$59,000	\$59,600
Turnkey wells drilled	47	24	122	76
Turnkey well completions	6	7	27	16

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segment achieved record levels of activity during 2000," Rose said. "Over the course of the year, we drilled 122 turnkey wells and captured a 65 percent share of the Gulf of Mexico turnkey market. However, due to a number of difficult wells, this segment's fourth quarter operating profit declined to \$2.1 million from \$6.2 million for the same period in the previous year." For the full year, drilling management services contributed \$21.6 million of operating profit, the third highest level in the company's history. On 2001, Rose said, "Our business is poised for very strong financial performance in the coming year. Customer budgets are projected to increase an average of about 20 percent in 2001, with activity in the international markets expected to accelerate as the major oil companies refocus on internal growth opportunities. In addition, the Gulf of Mexico rig market should continue to tighten as the industry drills aggressively to meet the need for new natural gas supplies." In 2001, Global Marine will also benefit from the full-year contribution of the new drillships placed in service during 2000. The Glomar C.R. Luigs and the Glomar Jack Ryan are state-of-the-art rigs and represent the culmination of a five-year capital investment program to expand the company's deep-water capabilities.

During 2000, Global Marine's capital spending totaled \$178 million and was dominated by final construction and commissioning costs of the two new drillships. "With these projects completed," said Rose, "our anticipated capital requirements for 2001 will be reduced by almost 50 percent."

Nearly half of the company's preliminary capital budget for 2001 is earmarked for rig upgrades to meet growing customer demand for deeper and more highly deviated wells. "These enhancements are expected to generate only minimal unpaid downtime," Rose added. In answer to concerns about the speculative construction of new offshore drilling rigs in the foreseeable future, Rose said, "Global Marine will not build new rigs on a speculative basis. If and when the market demands new rigs, term contracts will be available to support construction."

Coflexip Stena Offshore Closes On Aker Maritime Acquisition

Coflexip Stena Offshore (CSO) has finalized with Aker Maritime, the acquisition of its deepwater operations. The company's Deepwater Division, which is headquartered in Houston, Texas, was attained for \$513 million plus the assumption of the net debt of \$112 million. The two parties had initially announced, on October 29, 2000, that

they had entered into a conditional agreement whereby CSO would acquire the shares of the companies encompassing the Deepwater Division of Aker.

The final price of the acquisition will be subject to various adjustment mechanisms on the basis of audited financial statements of the Deepwater Division at December 31, 2000.

Coflexip Stena Offshore Receives CSO Deep Blue

Coflexip Stena Offshore received its newest ultra deepwater pipelay and sub-sea construction vessel, CSO Deep Blue, on March 1 from Hyundai Mipo Dockyards, subsequent to successful sea trials. The vessel has since departed

Ulsan, South Korea and is now heading toward the Netherlands.

The vessel's unique CSO designed pipelay equipment will be installed allowing it to lay rigid pipe (reeled and J-lay), flexible pipe and umbilicals down to 8,200 ft. (2,500 m). CSO Deep Blue is scheduled to commence operations this summer.

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Offshore Report

Friede Goldman Halter Negotiates \$100M Financing

Despite reports earlier that the company was headed for bankruptcy protection, Friede Goldman Halter announced that it and several of its affiliates have signed a letter of intent with Pegasus

Partners II and affiliated entities for Pegasus to loan \$100 million in the form of a senior secured note with a three-year maturity. In connection with the proposed transaction, the company will issue Pegasus warrants to purchase the company's common stock. The recommended transaction is subject to the

negotiation and execution of a definitive agreement and the satisfactory completion of due diligence by Pegasus.

Shares of Friede Goldman Halter Inc., fell on April 3 after the company said it may have to seek bankruptcy protection. Friede Goldman, whose problems stem from cost overruns on a number of oil

rigs it is building, said it plans to reschedule the call. Shares fell \$1.52 to \$0.90 cents on the New York Stock Exchange the day after it disclosed it was carrying \$107.7 million in overdue debt.

In an SEC filing, the company said if it can't renegotiate its credit and raise more capital, it may not be able to meet our obligations in the ordinary course of business and it may be necessary for us to seek protection under a petition of bankruptcy.

The company said costs for two rigs it is constructing for closely-held Petrodrill IV and Petrodrill V would run some \$121 million more than it expected.

BP And Houston Marine Team Up On Bunkering Venture

BP Marine and Houston Marine Services (HMS) are joining forces to begin a new chapter in ship bunkering in the western U.S. Gulf. Effective, April 2, HMS became BP's dedicated logistics provider in an area from Brownsville, Texas to Lake Charles, La.

BP Marine will serve as the marketing arm for bunker sales on behalf of the joint venture and will supply bunker fuel across a broad geographic area of the Gulf. The partnership will ensure bunker customers with long-term dependable access to quality bunker fuel coupled with the security of a logistical supplier.

Bunkers will now be available ex-pipe at the following terminals: Sun Marine, Nederland; ITC, Houston; Baytank, Houston Bayport; and Conoco, Clifton Ridge. Vessels calling on the other docks and anchorages in the geographic area will be delivered by barge.

Oceaneering Receives Letter Of Intent From Angola Drilling

Oceaneering Intl. has been granted a letter of intent from Angola Drilling Company (ADC) to charter the FPSO Ocean Producer for a period of seven years to produce the Canuku Area of Block 3 offshore Angola. ADC has a letter of intent from Sonangol Pesquisa and Producao to develop and produce the Canuku Area.

Under contract with Sonangol Pesquisa and Producao, Ocean Producer generated more than 12 million barrels of oil from the Kiabo Field in Block 4 over a period of seven years. The contract is expected to be completed in April, at which time Oceaneering will then move Ocean Producer to a shipyard for modification, life extension and repair as required for the new location.

Production from Canuku is scheduled to commence early in the third quarter of 2001.



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In keeping with the philosophy of doing things better, Wayne B. Smith, Inc. was looking for ways to provide better service to their customers and gain an advantage over their competitors. Mr. Pat Short, Project Manager for W.B.S. explained "The addition of the E-Crane to our off-loading facility has greatly improved our versatility. Not only are we more productive and efficient in completing jobs we have done for years, we have started to find new applications that allow us to offer more material handling services to our customers.

With the pinpoint accuracy of the E-Crane, we have decreased the possibility of fugitive emissions while at the same time increasing worker safety." Mr. Jerry Smith, General Manager for W.B.S. said the new E-Crane would be used dockside to unload bulk commodities. "It has the potential to increase capacity, but the main reason we went with the E-Crane was the ease of operation, efficiency and operator friendliness."

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The Cargill Fertilizer facility in Savage Minnesota needed to reduce operating costs and increase the volume produced by their barge offloading operation. A conventional cable crane and rope at "Port Cargill" facility for years but - increasing safety concerns, repair costs and poor reliability made it clear that a change was needed. Ricky Carlson, North American Operations and Engineering Manager for Cargill, explained, "the E-Crane™ is a key piece of equipment in the improvement of our Port Cargill facility. This crane will substantially improve the productivity of Port Cargill."

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Circle 240 on Reader Service Card

Offshore Report

Clamp Supplier Dives Into Project

Bluefin Robotics Corp. called on Clampco — a manufacturer of stainless steel T-bolt band clamps and V-band couplings — when it needed help "testing the waters." Bluefin specializes in manufacturing underwater robotic equipment for offshore survey, military,

design the AUV with robust modular joints, which would let operators disassemble the equipment in two directions. They could either remove panels from the AUV or interchange the tail section with the top sections of 10 other vehicles. A V-band coupling is a fastener that

offers this type of flexibility. But Bluefin had special design considerations above and beyond the standard V-band coupling. Tolkoff worked with **Carl Klaus**, sales engineer at Clampco, regarding Bluefin's custom requirements. Typically, V-bands have a gap under the latch mechanism to facilitate installation. However, the Bluefin engineers wanted

to reduce the gap to increase total surface contact with the flanges. So Clampco simply rotated the position of the retainer segments so that the ends of the segments would sit under the latch. To improve the coupling's corrosion resistance in the harsh salt-water environment, Clampco used 316 stainless steel bands.



ABOVE: This Bluefin AUV is outfitted with a custom designed 316 stainless steel half coupling from Clampco Products Inc. The coupling was designed to lay flush with the exterior of the AUV as well as to provide ease of assembly and disassembly. **BELOW:** V-band couplings from Clampco Products Inc. can be manufactured in a wide variety of diameters and styles.



and scientific research customers.

By working with Clampco Products Inc., Bluefin was able to complete an underwater robotics project for the U.S. Navy in record time. Bluefin designed, built, tested, and demonstrated its AUV (Autonomous Underwater Vehicle) for the Coastal System Station and the Office of Naval Research in approximately eight months — half the time typically required for projects of a similar scale. **Sam Tolkoff**, engineer at Bluefin, attributes this rapid development to one of its suppliers, Clampco Products, Inc. "We considered several other suppliers when we first looked into the project," says Tolkoff. "However, Clampco was able to offer us the best lead time, and this is exactly what we needed - fast delivery as well as special attention and support for our design requirements." Clampco handles special requests as a matter of course. For instance, Tolkoff's team needed to

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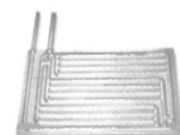
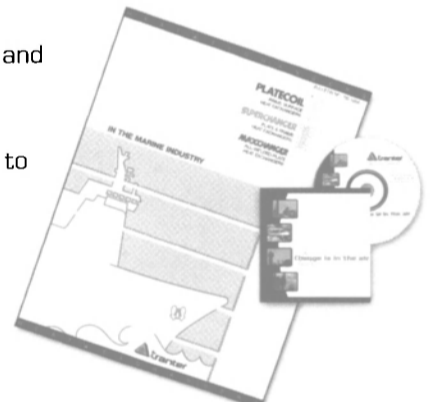
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Dockwise Performs Timely Delivery Of Shell's Brutus

On January 28, the motor vessel Mighty Servant 3 of heavy transport shipping specialist Dockwise, safely arrived at Corpus, Christi, Texas (after a seven-week

voyage) carrying Shell's 14,500-ton Brutus TLP (Tension Leg Platform) hull from South Korea. Moving at a speed of 13 knots, the vessel arrived via the Cape of



Good Hope. Dockwise was granted the contract by Daewoo Shipbuilding & Marine Engineering for the transportation of the TLP hull for Shell's Gulf of Mexico Brutus project. Measuring 266 x 164 ft. (81.2 x 50 m) with a breadth of 266 ft. (81.2 m), the TLP was loaded onboard Mighty Servant 3 by the float-on method at Daewoo.

The diagonal setting of the hull on the 131 ft. (40-m) wide deck of Mighty Servant increased the width of the transport to 368 ft. (112.1 m) — resulting in an overhang of 118 ft. (36 m) on each side of the ship.



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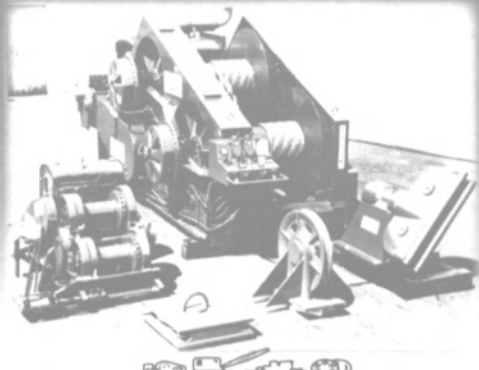


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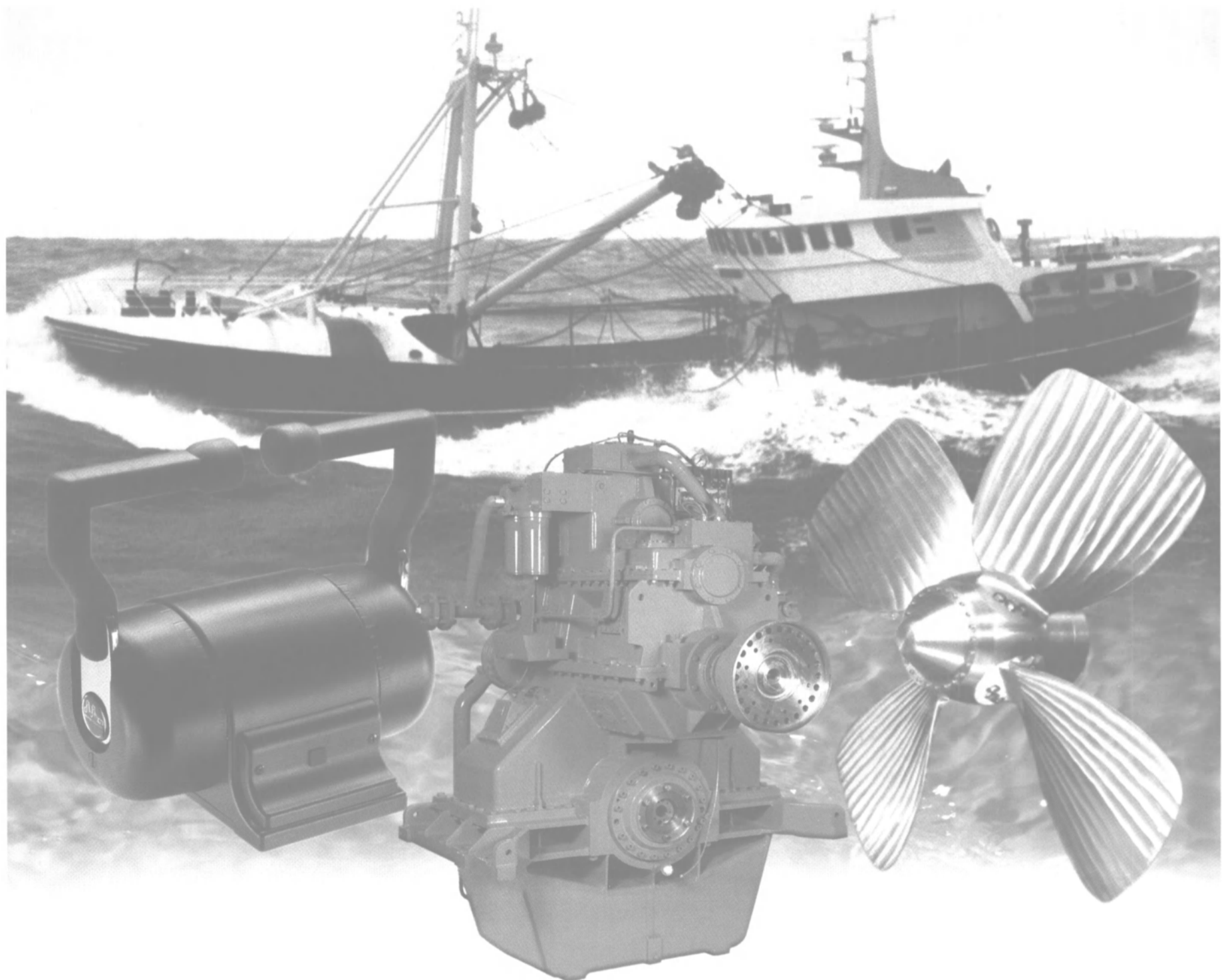
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Bollinger Wins K-Sea DH Barge Contract

The rebuilding of the U.S. petroleum carrying fleet to OPA 90 standards continues, as Bollinger-Gretna, Harvey, La., and K-Sea Transportation Corp. of New York have signed a contract for the construction of four double hull, ocean service, OPA '90 oil barges. The barges will

have capacities of 80,000 to 100,000 barrels. Terms were not disclosed. The barges will be built primarily for oil service on the Northeast U. S. coast. They will be coupled with existing K-Sea tugs using a connection system designed and delivered by Acomarin Engineering.

The new barges will feature double block cargo segregation, segregated ballast, cargo monitoring and vapor recovery systems as well as advanced electrical and hydraulic systems.


Walter Berry, executive vice-president and COO of Bollinger said, "K-Sea

has been a valued customer for service, repairs and regulatory inspections. This is our first opportunity to demonstrate to them why Bollinger is also a leader in construction of double hull barges and other vessels. We are also pleased to announce the return of new construction work at Bollinger-Gretna as **Kenneth Boothe, Sr.**, its general manager, and his shipbuilders have built numerous large double hull barges and many other barges and boats in the yard's long history."

Formerly known as Gretna Machine & Iron Works, a multi-use construction and repair/conversion shipyard, its previous owner had dedicated the 66 year-old facility exclusively to repair and conversion work in October 1997. Modules for all four barges will be fabricated at Bollinger Marine Fabricators Amelia, La and shipped to Bollinger-Gretna where they will be joined to other components produced at Bollinger-Gretna, where final assembly and installation of piping and other systems will be completed. Delivery of the first barge is planned for summer of 2002, with delivery of the remaining three barges scheduled at regular intervals.

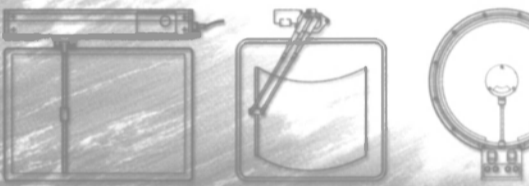
Telenor To Acquire COMSAT

Telenor of Norway and Lockheed Martin Global Telecommunications (LMGT) announced that Telenor will acquire LMGT's COMSAT Mobile Communications operations for \$116.5 million in cash. The acquisition, which positions Telenor as a major global satellite mobile operator, is subject to regulatory approvals. COMSAT Mobile, with annual revenues in excess of \$100 million, provides global mobile communications solutions to the maritime, land mobile and aeronautical communities, and offers data, voice, fax, telex and video capabilities via the Inmarsat satellite constellation. Telenor's purchase of COMSAT Mobile operations also includes two earth station facilities in Southbury, Conn., and Santa Paula, Calif. Linking the two U.S. stations with Telenor's existing earth station in Eik, Norway, will enable Telenor to offer true global coverage for satellite mobile communication services. Following the transaction, Telenor will be one of the leading Inmarsat global operators. While the companies pursue regulatory approvals, a process expected to be completed over the next several months, COMSAT Mobile will continue to operate as an LMGT business unit. Upon completion of the transaction, COMSAT Mobile will become a key part of the satellite mobile division of Telenor Broadband Services AS, operating through its wholly owned U.S. subsidiary, Telenor Satellite Mobile Services, a Delaware corporation.



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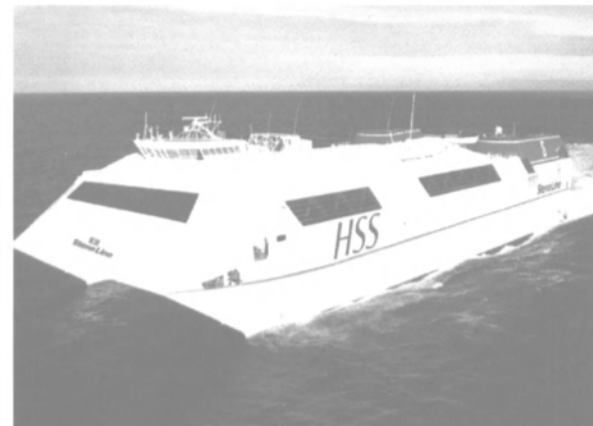
Stena Discovery Performance Improved With Enhanced Steering System

On February 14, the world's largest high-speed ferry catamaran Stena Discovery took off from Belfast, after a planned drydocking, and about one hour out at sea on the captain's command the waterjet control was switched over to steering by a retrofitted Humphree Interceptor Steering System. While the interceptors engaged and provided the means for directional control of the vessel, the steering buckets of the four Kamewa 160 SII waterjets, in total absorbing a power of 68.5 MW, automatically returned to their neutral, or boost position, allowing all waterjet thrust to be vectored forward for maximum thrust, and eliminating the waterjet bucket drag.

During transit to Hook van Holland in the Netherlands, a series of trials confirmed supreme performance of the Humphree interceptor steering system. The turning response of the vessel with the steering interceptor system active was described as faster and the general turning behavior compared well with that of four waterjets steering up to the bucket steering angle equivalent to full interceptor stroke. When passing the Land's End of England with quartering following sea and a significant wave height of about 10 ft. (3 m), the Captain concluded that the interceptor steering

system indeed worked fine and that the vessel was notably faster. In moderate sea at a vessel speed of 40 knots, the reduction of speed when steering with the interceptors was significantly reduced. The gain was recorded to one knot, or three MW in terms of delivered power. As the improvement is increasing with increasing sea state — the annual fuel saving is expected to be quite substantial. In addition, the auxiliary power requirement was reduced from about 120 kW to 4 kW, which adds up to an additional yearly fuel saving as well as it gives an idea of the mechanical and structural advantages of using Humphree interceptor units as control devices, whether they are used for steering or active damping of ship motions.

The patented Humphree interceptor steering system has been developed and delivered by the marine division of LA.ME., which is an Italian-Swedish joint-venture with electro/mechanical engineering and production in Milan and sales and hydrodynamic expertise in Gothenburg. The steering system comprises of four (two on each transom) compact hydraulically operated HV160 vertically mounted Humphree interceptor units, two hydraulic power packs, one in each hull, and a main control system unit for manual operation and



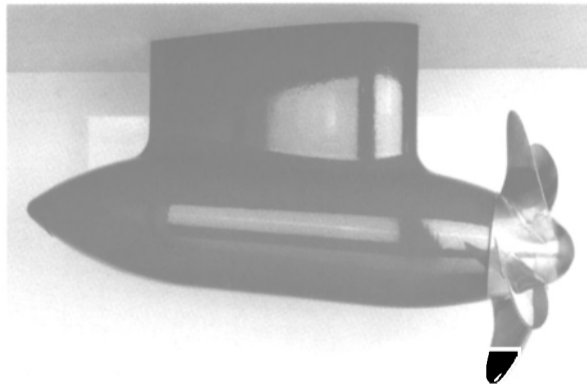
ship system integration. The steering interceptor system is fully integrated into the main steering system, including the autopilot, waterjet control system, and the ship's integrated monitoring system. When the interceptor steering system is active, the steering command operates only the interceptors to their maximum stroke, while if further steering is needed the waterjets are requested to engage and be deflected to add steering force. In rough seas, or should an emergency situation occur, the captain will have the joined force of full interceptor steering and full waterjet steering, resulting in significant fuel savings and/or improved safety at sea. Humphree Interceptor Steering Systems are designed to offer owners of high-speed vessels a unique means to increase maintained vessel speed and/or lowering fuel bills and reducing the environmental impact on sensitive routes.

Circle 29 on Reader Service Card

First Order For Dolphin Propulsion System

Seven Seas Voyager, the new 50,000-gt cruise ship under construction by T. Mariotti at its Genoa yard for delivery to Radisson Seven Seas in 2003, will be among the first ships to be equipped with the new Dolphin podded propulsion system, a system which was jointly developed by STN ATLAS Marine Electronics and John Crane-Lips.

Podded propulsors of the system are designed to deliver 2x 7,000 kW at 170 rpm. Main features include integration of a powerful electric drive into a hydrodynamically optimized pod below ship, resulting in a directly-driven propeller. Extensive CFD analyses and model tank tests have led to the development of a pod shape with enhanced efficiency and maneuvering characteristics. Dolphin has been developed for power ranges extending from 3 MW to more than 19 MW and is suitable for a wide variety of vessels designed for



high speed and good maneuverability operation. With a continuous rotation angle of 360 degrees in the vertical axis, the pod ensure optimum maneuverability for commercial vessels as well as those engaged in off-shore dynamic positioning.

The standard drive of the fixed-pitch propeller includes an air-cooled six-phase synchronous motor; gears, shaft systems, rudders and stern thrusters forming part of conventional electric drives are not required. The system's shaft is protected within its casing by a combination of face and lip seals.

In addition to the Dolphin system, the scope of delivery by STN ATLAS Marine Electronics and John Crane-Lips for Seven Seas Voyager includes a complete propulsion system with synchro-converters, control and joystick system, diesel alternators, and a high-voltage distribution assembly with propulsion and main transformers as well as bow thrusters.

Circle 71 on Reader Service Card

Austal Pioneers New Approach To Jet Room Design

Austal Ships recently released details of its Microplate Technology, an innovation developed through the company's commitment to vibration control, environmental diligence and the longevity of high-speed vessels. The result: a radical new approach to the design of jet room structures. "As water jets can cause considerable and potentially damaging vibrations, it is important that a sound knowledge of vibration control with respect to fatigue is employed in the design stage," said Chris Norman, Austal's director. "Austal's Design and Advanced Engineering Departments have developed a sophisticated in-house program dedicated to passive vibration control though design optimization."

CIMAC Set For Hamburg

The CIMAC Congress — one of the most important international events in the field of diesel and gas engines, as well as gas turbines — is set to meet from May 7-10, 2001 in Hamburg, Germany. While it is not solely dedicated to Ship Propulsion, the CIMAC Congress is an event that attracts the top minds in propulsion technology — marine, power generation and rail — from around the globe. The four-day congress offers engine technology and engine applications on a high technical level presented by experts. More than 150 papers are planned, and an accompanying exhibition showcases individual companies and institutions, offering information on their products and services. For more information, contact the CIMAC Central Secretariat at tel: +49 69 6603 1567; fax: +49 69 6603 1566; e-mail: cimac@vdma.org.

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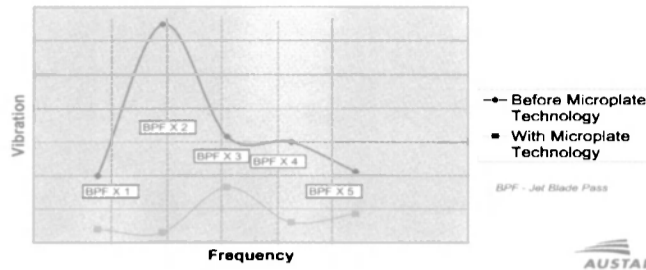
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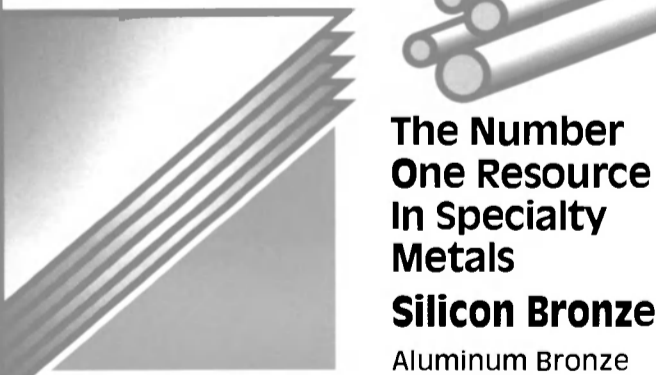
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Circle 73 on Reader Service Card

Increased Power For The Sulzer RTA96C

Wartsila Corporation has increased the power outputs available from Sulzer RTA96C low-speed marine diesel engines by approximately four percent, and also added a 14-cylinder model to bring the maximum output available up to 80,080 kW (108,920 bhp).

The higher powers and the 14-cylinder engine are intended to meet the requirements of shipowners and shipbuilders for both large, fast post-Panamax containerships and the next generation of larger ships of up to 10,000 TEU. The RTA96C now gives 5,720 kW (7,780 bhp) per cylinder maximum continuous output at 102 rpm. Thus the power output of the 12-cylinder RTA96C is increased from 65,880 kW (89,640 bhp) maximum continuous output to 68,640 kW (93,360 bhp).

The RTA96C is the most powerful in the Sulzer RTA series of low-speed marine diesel engines. The new RTA96C engines have the same dimensions and masses as the existing RTA96C engines built to the latest design standard.

They also have exactly the same brake specific fuel consumption (BSFC) and cylinder lubricating oil feed rate. Their times between overhauls are expected to be three years for major components. The NOx emissions of the RTA96C are within the limits set by the IMO regulation in Annex VI of the MARPOL 73/78 Convention.

Four Sulzer 12RTA96C low-speed diesel engines have been ordered by Odense Steel Shipyard A/S in Lindø, Denmark, for installation in four large post-Panamax container ships building there for A.P. Møller. The four ships are of A.P. Møller's S-/C-class, each having

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Propulsion Report

a container capacity of 6,600 TEU. The 12-cylinder engines will each develop 65,880 kW (89,640 bhp) at 100 rpm. The engines will be built under license from Wartsila Corporation by HSD Engine Co. Ltd. in Korea. The 12-cylinder RTA96C engine is the most powerful in the Sulzer RTA series of low-

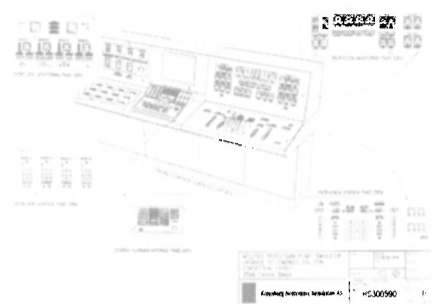
speed marine diesel engines.

Circle 72 on Reader Service Card

Full Mission Diesel Electric Simulator Debuts

RTM Star Center has created a strategic partnership with Royal Caribbean

International cruise line to develop and install what is described as the world's first full-mission diesel electric simulator. The simulator will be located at Star's center in Dania Beach, Fla., and is based on a design by Kongsberg Norcontrol. The simulator, based on a large cruise ship requiring 40 MW at 6.6 kilo-



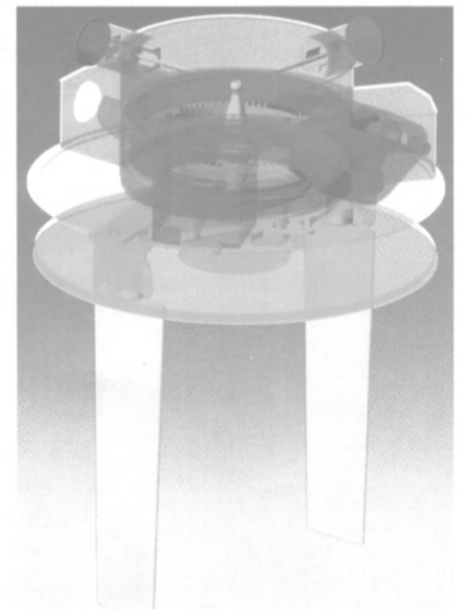
volts, will have enhanced mechanical and electrical systems to meet demands of both Royal Caribbean and STCW '95. The simulator will be constructed in two phases, with completion expected by the end of 2001.

Circle 74 on Reader Service Card

Voith Adds To Its Innovative Range

Voith Schiffstechnik has introduced a pair of new technologies to its already innovative range of Voith Schneider propulsion products. The Voith Turbo Fin is a rotating cylinder at the leading edge of the stabilizing fin which influences the flow acting on a tug's hull. According to Voith, the VTF smooths the flow to reduce turbulence and increases lift which, in the indirect towing method, results in higher transverse forces. After exhaustive model tests, Voith claims that a tractor tug fitted with a VTF unit was proven to provide an 18 percent increase in the transverse force compared to a tug without the new fin. Making the option more attractive; the manufacturer says that the VTF is available for a small cost for both refit and newbuild applications.

The other significant new development from Voith is the Cycloidal Rudder (VCR) (pictured below). The VCR, based on the proven Voith Schneider Propeller, is a propulsion and maneuvering system for newbuild ships that require maximum maneuverability over the entire speed range. The VCR has a rotor casing with a vertical axis of rota-



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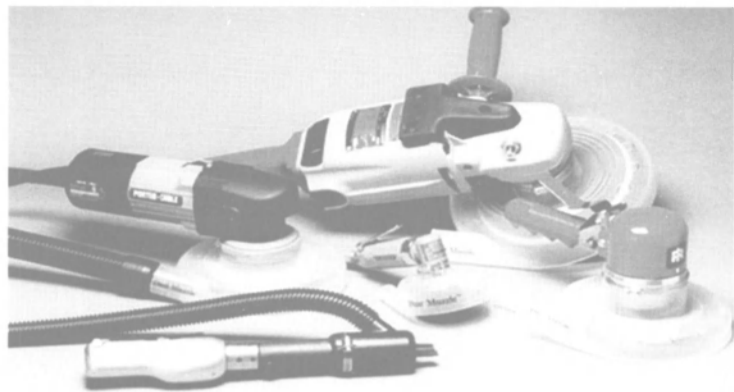
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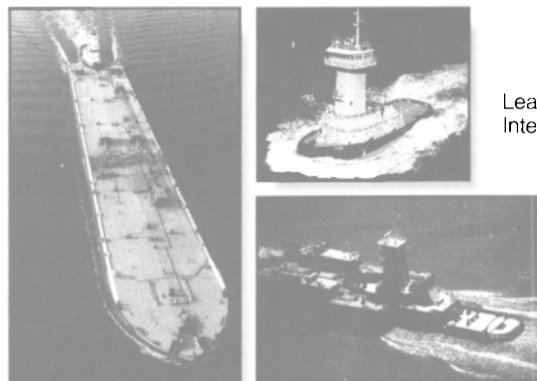
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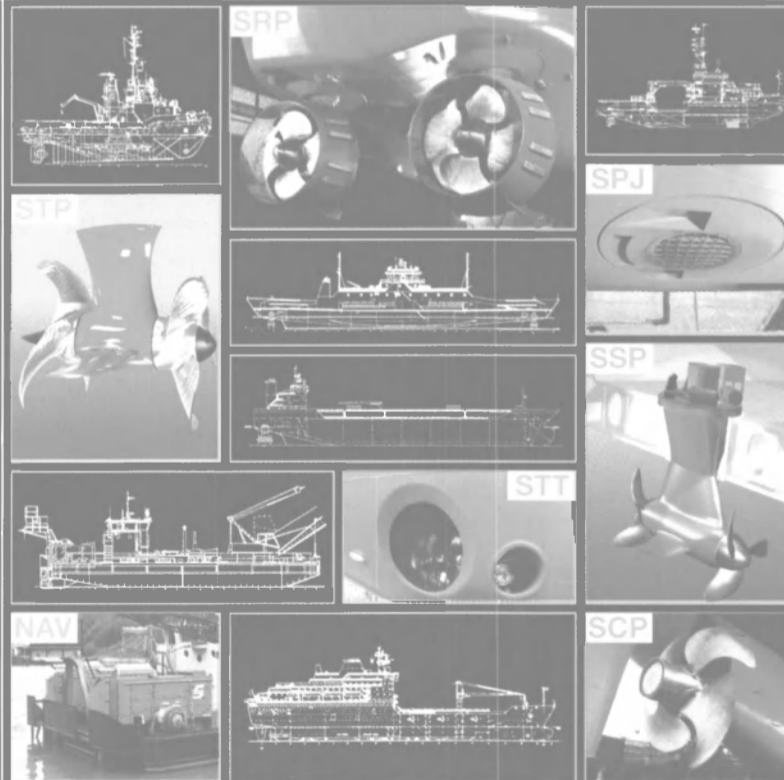
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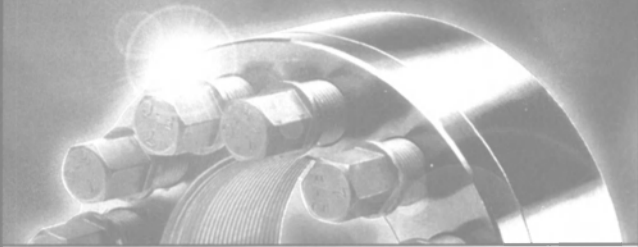
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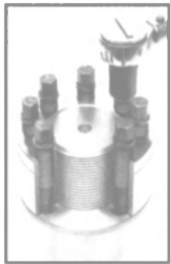
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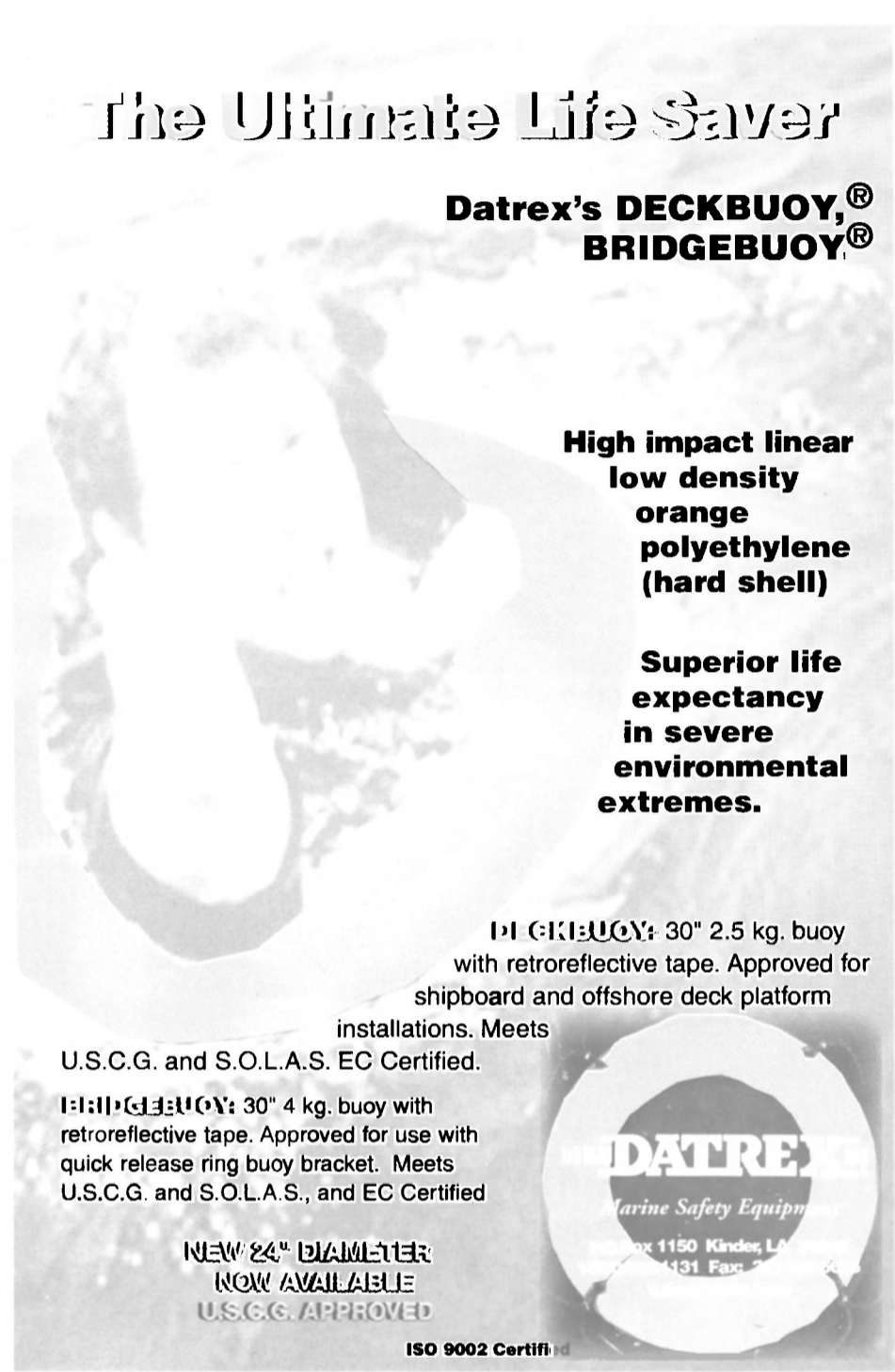
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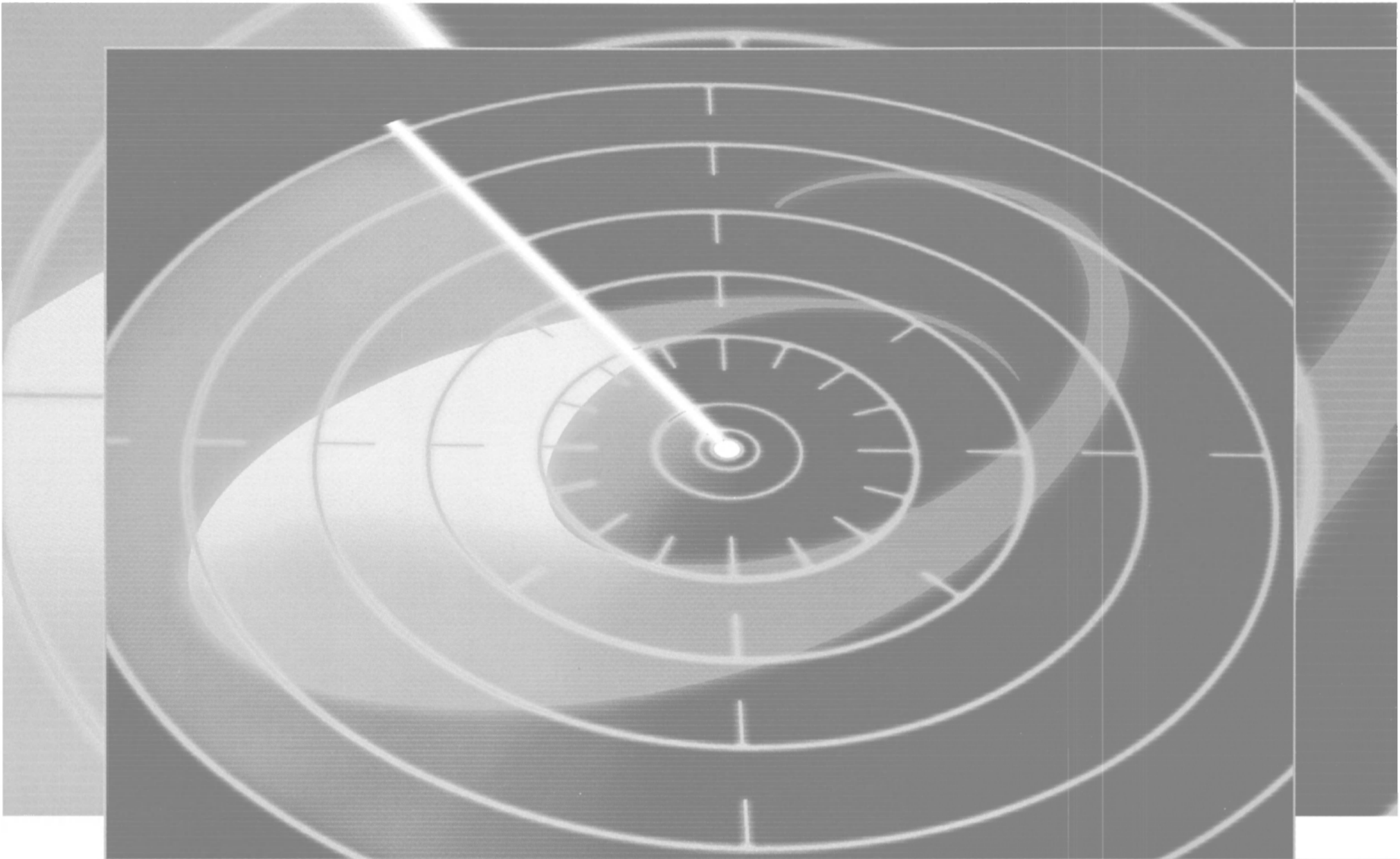
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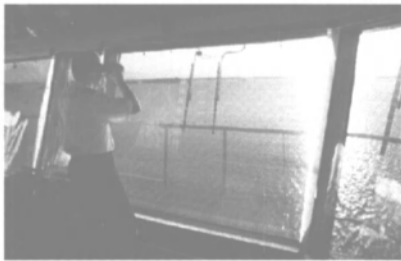
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Propulsion Report

tion, but with two ruder blades projecting from it. The configuration enables two modes of operation, passive and active. The passive mode is used for cruising/high speed maneuvering, and in this mode only the rotor casing performs partial rotations in both directions, thus the locked rudder blades are adjusted relative to the flow and act like conven-

tional rudders. For slow speed maneuvering the VCR uses the active mode. The uniform rotation of the rotor casing is superimposed by an oscillating movement of both blades around their own axis. In essence, this mode allows for an identical thrust to be generated in all directions.

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Rolls-Royce Delivers Largest Steerable Water Jet

The first pair of Kamewa 200 SII water jets, and two smaller units (140 SII water jets), are currently being installed on a 459 ft. (140 m) fast ferry at Alstom Leroux Naval's yard in France. Dubbed the world's largest

steerable water jet, this Kamewa 200 SII unit has an inlet diameter of 200 cm. The vessel, a Corsaire 14000 design steel-construction, monohull ferry will be driven by a combination of gas turbines and diesel engines, producing a cumulative 66,200 kW and a speed of 40+ knots. The ferry is being built for Greece's NEL Lines, and will enter service able to carry 1,800 passengers this summer.

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STN Atlas Offers New Range Of Shaft Alternators

STN Atlas Marine Electronics has extended its range of shaft alternators for supplying mains power driven via ship's engine with the introduction of a new series of high voltage units capable of providing power ratings from 4,000 to 10,000 kW.

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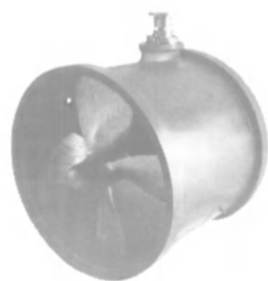
MAN B&W Targets Mid-Size Containership Niche

While much of the innovation in the containership segment has been focused on ever-larger ships, MAN B&W has made a point of ensuring that its engine ranges best suited for the medium-size containership segment — up to 3,000 teu — maintains its technological edge to ensure ship owners get the power, economy and efficiency they demand. While the larger containership segment has garnered a well-deserved portion of attention given the technological challenges, the engine maker notes in its new publication "Propulsion of Medium Sized Containerships" that the market for new containership construction is expected to grow seven to eight percent per annum, at least for the next five to 10 years. While the market for ultra large containerships will undoubtedly grow, so too will the demand for smaller, feeder carriers, as the number of ports able to handle the largest ships will still be limited.

Another factor boding well for the segment is the age of the fleet, with many ships approaching 35 to 40 years old and heading for scrapping. Some analysts estimate a need for between 100 to 120 ships per year in the 1,000 to 3,000 teu range. To fulfill the tremendous power need, MAN B&W offers its MC engine program covering the power span from 1,600 to more than 68,500 kW. The latest additions to the range include the L60MC-C and the L70MC-C specifically targeting the RoRo and the medium-sized container vessel market. For a copy of the technical publication from MAN B&W

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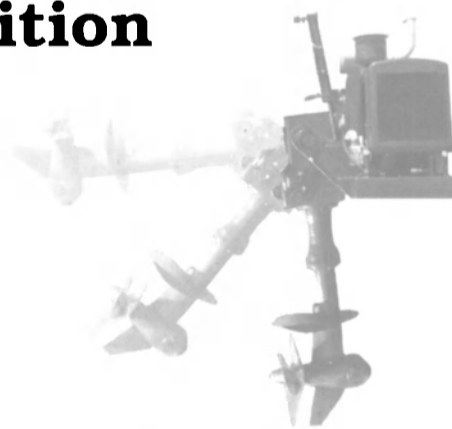
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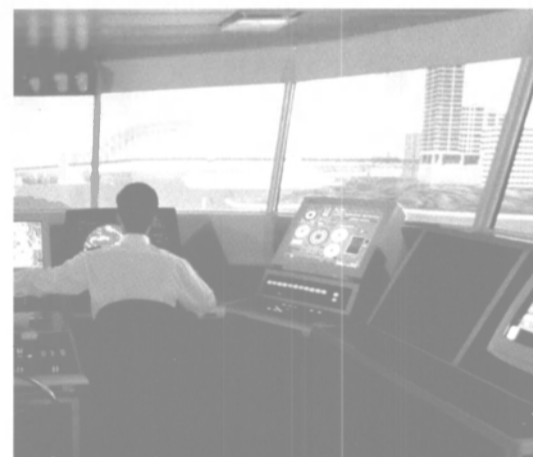
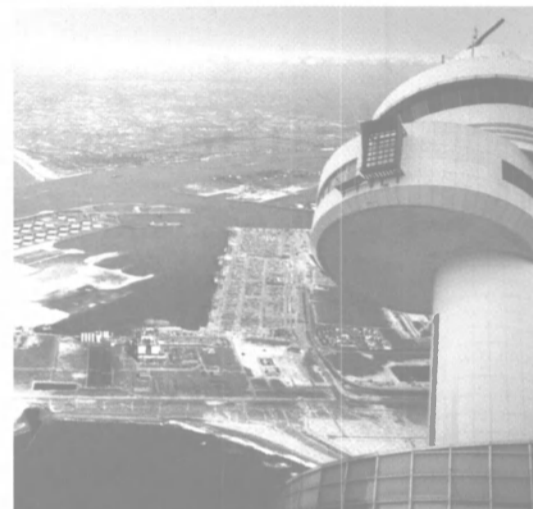


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Wärtsilä: Smokeless by Common Rail

There are two main ingredients to common rail fuel injection, one being the freedom to choose injection pressure and timing totally independently of the engine load. The other is computerized

control, which makes it possible to consider several engine parameters and optimize the injection and combustion in each load situation.

The Wärtsilä Common Rail develop-

ment was kicked off for both medium-speed engines and low-speed engines at a seminar in June 1997. This year both medium-speed engines and low-speed engines will enter commercial service.

The Wärtsilä Common Rail concept for four-stroke engines comprises: Camshaft driven high-pressure pumps; Accumulators for elimination of pressure waves; All in hot box for maximum safety; Engine driven control oil pump for easy black start; Suction control of fuel flow for highest efficiency; Low cam load for maximum reliability.

The Sulzer Common Rail concept, i.e. the RT-flex, for low-speed engines comprises: Engine driven pump unit for high pressure fuel and oil for exhaust valve actuation; One rail valve per injector for combustion optimization flexibility; Volumetric control of fuel amount; Modular build-up, including control system, for maximized redundancy.

At the moment the Wärtsilä 46 and Wärtsilä 32 are available for deliveries during this calendar year, and the Wärtsilä 38 and Sulzer ZA40 are scheduled for pilot delivery later. On the RT-flex side the RTA58 size is already delivered and therefore available, and orders have also been received for the RTA60C.

Low NOx emission

"Low NOx Combustion" made it possible to drastically reduce NOx emissions and at the same time in all cases improve fuel consumption. Further small improvements in NOx emissions could be achieved by accepting a higher fuel consumption. However, CO2 emissions are considered to be even more important in the future than NOx emissions, and therefore Wärtsilä has chosen to go for methods that all the time keep fuel consumption low.

During the 1980s, Exhaust Gas Recirculation was much discussed as a method to reduce NOx and it certainly works. But even when the fuel has insignificant amounts of sulfur, the practical application of EGR causes unacceptable operational problems. The introduction of water in one form or another into the engine cylinder seems to be the feasible way forward. The methods chosen by Wärtsilä are Direct Water Injection, Combustion Air Humidification and Steam Injection. Fuel-water emulsion certainly is an opportunity, but it has been postponed until common rail injection systems are introduced in all engines because fuel-water emulsion in a conventional injection system causes considerable problems.

An exciting new development at the moment is the Combustion Air Saturation System, where a special HI-FOG nozzle is used to introduce water after the turbocharger in the form of very small droplets. These droplets evaporate fast, and further heat is introduced in the air cooler, which now acts as an air heater, resulting in combustion air with

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about 60 g humidity per kg air. With this amount of water it is possible to arrive at NOx levels of 3 g/kWh. The HI-FOG nozzles and the water technology are provided by Marioff. For low-speed engines the Water Cooled Rest Gas (WaCoReG) is pursued. This system utilizes the same mechanism as an EGR system would, i.e. introducing some rest gas into the combustion space.

Fuel flexibility

Wartsila has given priority to the development of engines capable of operating on Orimulsion and even bottom oils. One logic is that these fuels are so cheap that it is possible to apply a considerable amount of exhaust gas cleaning technologies and still deliver energy at a cost-effective price. Geologists and chemists seem to agree that the large salt water seas have unlimited capacity to take sulfur emissions. The trick seems to be to get the emissions to touch the salt water before they touch sensitive vegetation on land. Sea water scrubbing sounds like an interesting opportunity if such a device could be made to work. For this reason Wartsila has taken up the development of a scrubber system together with Marioff.

Minimized waste

Increased efforts on numerous fronts have been designed to minimize diesel engine wastes, including used lubricating oil, used oil filter cartridges, and spare parts scrap. The way to avoid used lubricating oil is never to have to change the oil. That was quite easy in the past when oil consumption was high. With the introduction of the antipolishing ring the threshold became higher. However, the oil companies have responded well to the challenge, and at the moment an oil consumption of 0.4 g/kWh is enough for the best lubricating oils to keep them stable without oil changes. Development is going on all the time.

Wartsila, Marioff To Cooperate On Emission Control Technology

Wartsila and Marioff, agreed earlier this year to cooperate within the area of emission control technologies for reciprocating engines. Marioff is a specialist in creating humidity, while Wartsila needs humidity for reduction of NOx in diesel, and perhaps gas engines.

The introduction of water into the combustion space of a diesel engine in one way or another reduces NOx formation. There are two main mechanisms for this phenomenon, one being the addition of mass in the combustion space. The other effect may be evaporation of the water in the combustion space during combustion. Both mechanisms are utilized in the Direct Water Injection system, which is one of the

technologies promoted by Wartsila. However, these technologies cannot be used for very low NOx, because the evaporation of the water in the combustion space will steal some of the combustion energy. For the lowest NOx values it is therefore desirable to go another way, and that is to evaporate the water before it enters the combustion space.

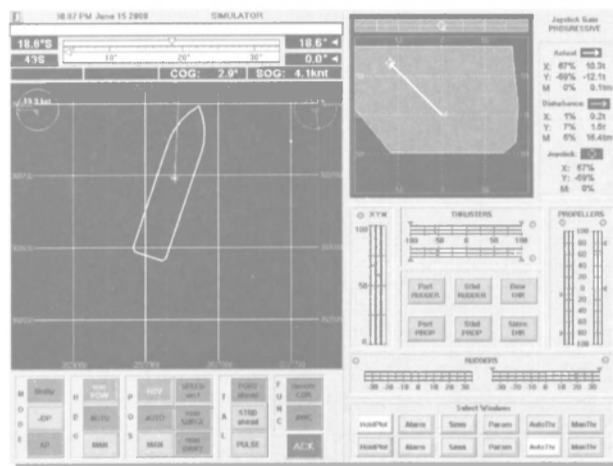
Wartsila created such a system in the 1980s called Combustion Air Humidification. At that time it was not possible to add very much water into the combustion air due to sensitive cylinder liner piston ring technology. Since the introduction of the antipolishing ring diesel engines have been virtually insensitive to humidity in the combustion air, Wartsila

decided to take up the development of this system again. Here the Marioff technology to create very small water droplets, HI-FOG, comes in handy because when water is introduced directly after the turbocharger in an environment of more than 200 degrees C and more than 75 m/s air velocity, the small water droplets will evaporate fast.

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Inland Report

Technology, Image Top Inland Agenda

The North American inland marine market is neither technologically archaic nor as environmentally hazardous as many individuals outside of the marine market may think. These two issues

dominated a recent meeting sponsored by the Ship Operations Cooperative Program (SOCP) held in early March at the Litton-Avondale Shipyard. The profitable process of moving products

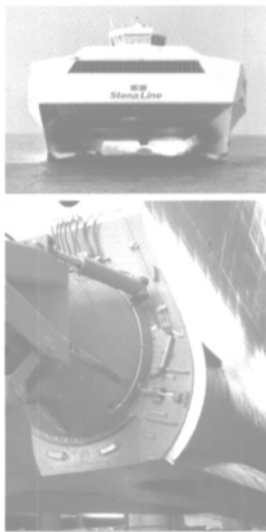
through North America's vast inland waterways systems is increasingly dependent on vessel owners and operators finding and incorporating new technological means and methods to

increase efficiencies. Speakers from industry leading companies such as Kirby Barge Co.; Ingram Barge Co.; Canal Barge Co.; and American Waterways Operators (AWO) dominated the day, and gave presentations meant to dispel some commonly held notions as well as update on the market's collective move to technological solutions.

According to AWO's **Ken Wells**, market expansion projections are flat both in terms of materials moved and the overall customer base of shippers. Thus, the onus is on owners and operators to ensure that their fleets are adequately outfitted to save precious time, money and fuel. While Wells stressed that the inland market must continue to find more and more efficient means to move cargo, he admitted that the industry and the technology already incorporated remains the industry's "secret," as many outside of the maritime market don't "understand or acknowledge investment in technology of a transportation mode that can take days or weeks."

While the need for a technological infusion is evident, nearly all speakers echoed the sentiment that the inland industry is in dire need of a good publicity boost. As most industry insiders already know, the focus on marine transportation is usually connected to an accident, garnering the owners and operators a disproportionate share of "bad press." The owners are hoping to craft and transmit a new message and image, one that focuses on the many positives in the inland marine industry, such as the fact that the marine industry boasts, by a wide margin, the lowest air emission per ton of cargo moved, and that the industry has in place (thanks in large part to OPA 90) the most comprehensive oil spill containment and clean-up program of any transportation mode.

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Ingram Barge Co. Goes High Tech

"What can we do to get these vessels up and down the river quicker?" That is the first question asked by **Mark Stevens**, Ingram Barge Co., when evaluating any new and/or improved technology for installation on his company's fleet. Stevens is responsible for ensuring that the privately held company's fleet, which includes 62 operating vessels and 1,800 barges, cost-efficiently incorporates the latest technology designed to ensure safe and profitable operations. He notes that GPS and electronic charts are two of the more dramatic changes in technology to hit the inland waterways, but admits he is not yet sold on the exact electronic chart package to select. He notes, for example, that the current electronic chart offerings vary substantially in both appearance and format, saying that, for example, some systems are North-up

instead of Course-up orientated. The company, as it turns out, was interested in a package with provided Course-up, making it easier, he claimed, for its captains to quickly decipher and utilize. Beyond the navigation realm, however, Stevens admits that information — particularly the ability to gather and disperse real-time information increasingly faster and more efficiently — is the cornerstone to running a profitable fleet. The company currently utilizes a satellite communication system, moving an estimated 600,000 characters of data through the system every morning. Stevens sees the push toward vessel-based transponders and VTS as a potential boom for gathering and disseminating information. He said that while the primary focus regarding transponder use today is safety, he would like to see the technology expanded to allow for the barge fleet to automatically transmit positions and logs, allowing the cus-

tomers to dial in and use it as well.

Kirby Focuses On Training & Edu

As the number of marine accidents continues to multiply, both in the brown and blue water environments, it is evident that technological solutions are not the sole answer to a complex problem.

Greg Binion, vice president Canal Operations, Kirby Barge Co., helps to oversee the personnel responsible for the operation of more than 230 towing vessels and 700 barges. Binion notes that the methods of training vessel crew have changed dramatically, particularly in the past 10 years. In 1990, he said, most crew training occurred on the vessel, while today the well-rounded program includes classroom, simulation and on-board training. In fact, Kirby Barge employs 16 full time staff and eight instructors in its dedicated training center. Noting that a canal wheelman earns

around \$70,000 per year, and a tankerman approximately \$40,000, and the fact that financial liability for mistakes is going nowhere but up, he said that it is increasingly important to provide the training and educational facilities to ensure that the crew is trained correctly the first time, but also has a resource to help further their careers, thus helping to improve employee retention. To this end, Kirby offers "next level" training such as management courses and advanced tankerman training. "Most wheelmen don't have formal management training, and Kirby is compelled to provide it," Binion said. In the case of advanced tankerman training, the company is helping to protect its own assets as well. The goal of this course is to reduce spills — spills that would cost



Safe, efficient and technologically proficient inland transportation was the topic of a recent meeting of the SOCP.

the company dearly in terms of both money and image. However, the company has also found that after about 18 months on the job, a certain degree of job complacency sets in, and the course is timed to ensure that this critical position is filled with qualified individuals who are acutely aware of the latest techniques, and ramifications for not following them.

SCA's Walker:

The Time To Build Is Now

Allen Walker, president of the Shipbuilders Council of America (SCA), in a discussion sponsored by the Ship Operations Cooperative Program (SOCP) and held in early March at the Litton-Avondale Shipyard, said that for many reasons, the U.S. ship and boatbuilding industry is situated for a boom. Following are his four reasons:

1. OPA 90

OPA 90 has long been discussed as the impetus for barge and shipbuilding boom in mid- and large-size U.S. yards. Walker notes that 30 to 40 tank barges and 15 tankers must be built by 2005, and, by waiting, owners could in fact be driving the ultimate price of the vessel up. As yards get filled, it will become increasingly difficult to secure the prime delivery slots, and the full force of demand and supply will be felt.

2. Offshore Expansion

The offshore market is ripe for expansion, Walker reasons, by the move to deeper waters, and the resultant need for new rigs, and very large crew and supply boats to service them. SCA projects that the influx of offshore related orders will start at the end of 2001. In addition, the green light for FPSO vessels in the Gulf of Mexico will result in a significant amount of business, as there will be a need for an estimated five FPSOs and 10 shuttle tankers (two for each FPSO) by 2005.

3. Passenger Vessels

Walker noted that there are currently nine cruise ship projects in the pipeline. But he sees the brunt of business in this sector, by vessel number, coming in the passenger ferry segment, as urban planners increasingly turn to the waterways to free up road congestion.

4. Containership Construction

Finally, containership construction is also considered a prime target of U.S. shipbuilders, as the U.S. containership fleet of about 100 vessels is a rather old fleet, and much of it will be due for replacement in the next 15 years. In addition, the move towards increasingly larger containership — and the relatively small number of ports capable of handling them — should result in a significant feeder containership boom.

Corpus Christi - Sept. 11th

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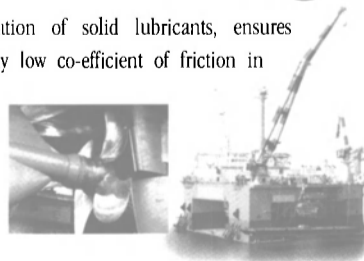
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Ship's Store: Safety Products & Systems



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Book Dedicated To Safety

Safety and Security at Sea, by D.S. Bist, is a publication that is concerned with the safe operation of ships and preventing errors and oversights. The book is aimed at every deck officer, regardless of rank or ship. **Circle 109**



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3M Marine's Scotchlight Reflective Material SOLAS Grade 3150A enhances the visibility of flotation devices. Supplied as a silver, flexible, reflective material with a pressure-sensitive adhesive, it is ideal for vests, life jackets, buoys, rafts, life boats and exposure suits. **Circle 110**



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Poster Promotes Safety

The North of England P&I Association has published another of its colorful cartoon posters to remind ship owner and operators the need for efficient man-overboard procedures. The poster highlights the importance of maintaining a good lookout and the immediate deployment of lifebuoys. **Circle 112**



■ NORTH OF ENGLAND

McMurdo Develops Rapid Radio

The G4 406 GPS EPIRB was recently developed by McMurdo, a world leader in technically advanced electronics. The G4 features a built-in, 12-channel, parallel GPS receiver. With an EPIRB alert time of three minutes to the search and rescue services, lengthy searches and delays can be avoided. **Circle 113**



Dalloz Targets Distributors, Users With Safety Brochure

Dalloz Safety, a leader in designing personal protective equipment, has produced a new, pocket-size brochure describing the company's protection product lines. The brochure is targeted toward distributors and users, and describes Dalloz Safety's eye, head, hearing and respiratory protection product lines. For a free copy **Circle 115**



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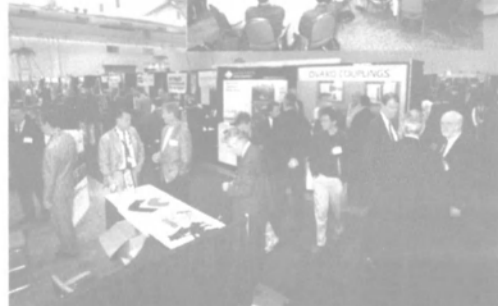
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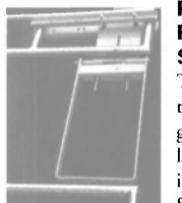


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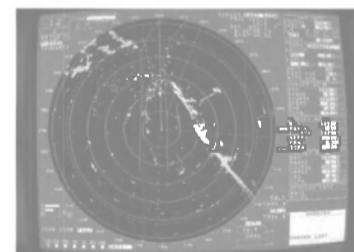
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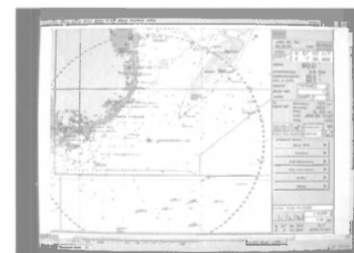
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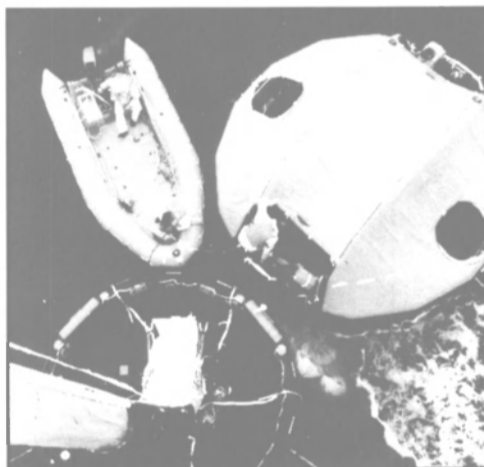
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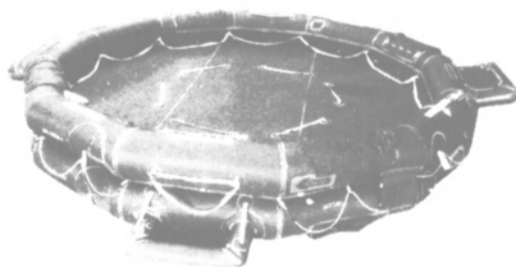
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Datrex is pleased to present a selection of its finest marine safety equipment products available. These products have been designed to provide the utmost in reliability and performance. They also fulfill the mandatory marine safety equipment requirements as set forth by the United States Coast Guard and the most recent Safety of Life at Sea (SOLAS) 1998 amendments. Circle 153

Solar Solve Provides Shade From The Sun



Solar Solve Marine is an award winning company based in South Shields at the mouth of the river Tyne, an area with strong maritime traditions in the north east of England. We are a world leader in the design, development and manufacture of high performance rollers sunscreens for the maritime industry. Visit the company's website to find out more... www.solarsolv.com Circle 154

Wynn's Wipers Provide Clear View

The Type "C" is a heavy-duty internally mounted motor straight-line wiper from Wynn's Ocean Range. It offers an advanced design of linear action window wiping systems for marine and other specialist applications. Wynn wipers are designed to be durable, reliable and quiet. Circle 155



Abandon Ship With Mustang

When lives are at stake, an immersion suit with the quality and performance of Ocean Commander is quintessential. Forty-five percent lighter than conventional suits, it is easy to get into and so flexible that it is ideal for abandonment procedures. In addition to the Ocean Commander, Mustang provides an array of high tech survival and protective equipment to NASA, the U.S. Air Force, the U.S. Navy, Coast Guards, and professional users in more than 20 countries worldwide. Visit www.mustangsuvival.com Circle 157



Walport's Videos Re-Enact Emergency Situations

Walport USA has released its video-based Basic First Aid for Seamen training course. Parts one and two of the three-tape set feature



ALSTOM

91,000 gross tons

965 feet long

2 pods (27,000 Hp each)

Turns on a dime

We make amazing things happen



ALSTOM Power Conversion, in partnership with Kamewa of Rolls-Royce, has designed the world's largest, most advanced, electric propulsion pod. All four of Celebrity Cruises' new Millennium class cruise ships will be driven by our Mermaid™ azimuth external propellers. So too will the Queen Mary 2. The compact Mermaid™ system releases valuable space inside the hull to accommodate more passengers.

Simpler, more flexible operation with higher overall efficiency make Mermaid™ the ideal propulsion solution. This fully integrated system provides excellent maneuverability and crash stop capability and reduces the need for tug assistance. Noise and vibration levels, NOx emissions, maintenance schedules, installation time and costs – all are substantially reduced to provide a safer, greener, more efficient operation.

ALSTOM, the global specialist in energy and transport infrastructure

www.powerconv.alstom.com

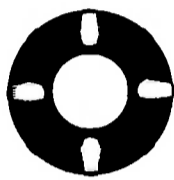
Instructional Videos For Marine Industry



medical professionals portraying shipboard personnel as they demonstrate the immediate actions required for stabilizing the condition of ill or injured crewmember. www.walportusa.com or email us at sales@walportusa.com
Circle 165

Suspenders Provide Maximum Protection

Lightweight, compact and easy-to-wear, Suspenders is designed to provide maximum safety while not confining sailors or workers. The slim-line life vest is available in manual or auto-inflate models, both, which are U.S. Coast Guard Approved. Premium quality construction from super strong 420 Denier nylon outer shroud, the vests are also designed as easy to re-arm after use, and free CO2 cartridges are provided with auto units. Inflates to 35 lbs. of buoyancy.
Circle 166



Reflexite Goes The Distance With Its Retroreflective Prisms

At sea, Reflexite's cube-corner prism material is visible at distances of more than half a km. The U.S. Coast Guard has approved Reflexite material for use on its aids-to-navigation system of color-coded dayboards, buoys and channel markers. The company develops, manufactures and markets retroreflective products based on its proprietary technology to enhance visibility and safety worldwide, visit www.reflexite.com
Circle 167

CWWS' Solutions for Oily Water Separation

Heli-Sep oily-water separators have completed efficient bilge water treatment since 1983. Manufactured by Coffin World Water Systems (CWWS), Heli-Sep is designed for easy installation and maintenance. Heli-Sep reduces oil discharge to less than 15 ppm. A new technical brochure now available from the company.
Circle 116

INVSAT Offers Offshore Communications

INVSAT provides telecommunication systems to customers regarding complex, daily operations. In its latest issue of its company newsletter, Uplink, INVSAT aims to keep customers updated on its latest products and services.
Circle 105

Crusher Plug Optimizes Resistance

CSD International, of Aalten, the Netherlands, introduces the new Crusher Plug for the fire-resistant ducting of plastic pipes. The plug can duct pipes through decks and bulkheads through walls and ceilings in on board ships and buildings.
Circle 108

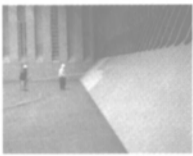
Eliminate Keys Forever

Darakey, Inc., an international leader in rugged token-based technology, announced the Guardian Access Control System, designed to improve security for commercial facilities. Guardian is a stand-alone controller that installs at access control points (gates, doors) without the need for a computer network or traditional key locks.
Circle 114



ZF Marine — Your Solution For Marine Transmissions

With a sales turnover of more than \$200 million, ZF Marine Group is one of the world's largest manufacturers of marine transmissions in the 10-11,000 hp range. The Group has diversified to include a full range of propellers, surface-drives and marine control systems for all types of vessels.
Circle 125



HoldProducts Guards Against Cargo Corrosion

HoldProducts has recently introduced new barrier and cleaning products to the shipping industry. Hold-Block-10 protects ship holds against corrosion from sulphur, salt, potash and other such cargoes. The biodegradable product is easy to use and safe in occupied areas. www.holdproducts.com
Circle 126

Transas Adds To Product Line

Transas boasts one of the most innovative lines of navigational simulator products, which is constantly being updated and enhanced with new configurations and additional features. Transas offers the most effective training tools, at very competitive prices. www.transas.com
Circle 128



Fike Holds High Presence Onboard And Offshore

Fike Systems are an effective option for many shipboard and offshore applications, such as: machinery spaces, generator pumps, flammable liquid and chemical storage, paint lockers, electrical areas, cargo spaces, and more. Fike systems provide the flexibility to apply safe, environmentally friendly FM-200 extinguishing agent when required. Visit www.fike.com or email: fpssales@fike.com
Circle 129

Get Rid Of Dust With Trelawny Tools

Trelawny shrouded pneumatic tool and vacuum systems are utilized where dust containment is required as well as for the removal and recovery of lead or other hazardous materials. For more information contact Trelawny, 93 Great Valley Parkway, Great Valley Corporate Center, Malvern, PA 19355. Website: www.trelawnyonline.com
Circle 134

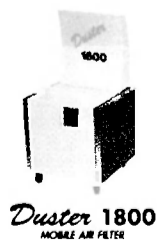


Detect The Flaws With Krautkramer's USN 60

New USN 60 Ultrasonic Flaw Detector combines the advantages of digital signal processing with detailed dynamic echo information previously only possible with analog CRT displays. The product has 250 kHz to 25 MHz capability with eight selectable frequency ranges. email: infolink@krautkramer.com
Circle 136

Clear The Air With Island's Duster 1800

Island Clean Air's Duster 1800 is a powerful multi-use industrial air filtering machine that can remove large quantities of airborne dust and toxic fumes inside work areas. At 1800 CFM it filters down to sub-



micron particles with two large cleanable filters. Two activated carbon cells with 14 lbs. of carbon remove toxic fumes and odors — even cigarette smoke. Visit the company's Web site at: www.islandcleanair.com
Circle 137



Senior Flexonics Regulates Gas Turbine Temps

Senior Flexonics Pathway has developed a new composite expansion joint for high temperature operation for gas turbines and other industrial applications. This new technology solves many of the problems of the rapid temperature rise and frequency of start-ups/shutdowns inherent in gas turbine operations. For more information
Circle 138



Put The Squeeze On With Clampco's Components

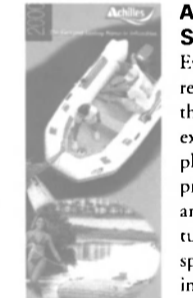
Clampco Products, Inc. is a manufacturer of high quality, heavy-duty stainless steel T-bolt hose clamps; V-band couplings; and metal strap assemblies. Clampco also offers all 316 stainless components for special designs. Clampco is certified to ISO 9001 and is known for its product, quality, customer service, design assistance, and on-time delivery. Contact: Clampco Products, Inc. at 330-336-8857.
Circle 139



SUPERBOLT

Superbolt To The Rescue

Superbolt manufactures its products in special sizes, threads, configurations, materials and ratings. The company's engineers encourage discussion of special problem applications. For more information: log on to: www.superbolt.com
Circle 140



Achilles Ensures Speed, Efficiency

Every Achilles boat produced represents the combination of the company's many years of experience. Achilles' modern plant was designed solely for the production of inflatable boats, and its computerized manufacturing and design systems ensure speed, efficiency and — most importantly — quality. Visit www.dupont-dow.com for more information.
Circle 148

Intrinsically Safe Gauge — Upgraded

The Cygnus 1 Intrinsically Safe thickness gauge, by Cygnus Instruments ensures safe thickness measurements on pipelines, tanks and structures in hazardous areas. Minimal preparation is needed, including gas and oil measurements.
Circle 117



LOADMASTER

Trust Vessel Construction To Loadmaster

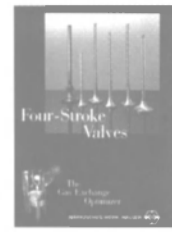
Loadmaster has its heritage in the fields of ship design and construction, and over the years, the people of Loadmaster International have developed close working relationships with class societies, ship owners and ships' officers. Visit www.loadmasterint.com
Circle 149

Hatlapa Answers The Call In 48 Hours

Hatlapa has always been — and will always be — dedicated to the shipbuilding industry. All of Hatlapa's products such as deck machinery, compressors and



steering gears, derive from the company's activities in the marine field. Hatlapa provides world-wide service to any place within 48 hours.
Circle 156



Engine Manufacturers Rely on MWH

For decades, MWH has been one of the most important manufacturers of valve systems in the world. Our reputation for excellence is based on a wide product range produced to superior quality standards.
Circle 158



Man B&W Engines Are Tuned To Environmental Issues

To support cruise vessels slow-steaming in sensitive glacial waters, MAN B&W diesel developed Invisible Smoke (IS). These engines provide smokeless performance at the lowest load levels. MAN B&W modern IS engines use fuel-water emulsification with only moderate water content to perform with invisible smoke and clean exhaust at any load with low NOx emissions.
Circle 159



UltraStrip Offers Quick Removal

Jean-Michel Cousteau, son of the late explorer and environmentalist, Jacques Cousteau, poses with the UltraStrip Robotic Hydro blasting System. The unique, patented industrial grade robot is capable of removing coatings from the hulls of ships at the rate of 2,000 to 10,000 sq. ft. per hour.
Circle 160



Gage Coating Thickness With PosiTector 6000

The PosiTector 6000 Series hand-held coating thickness gages measure coatings on both ferrous and non-ferrous metals. Features include Instant Automatic Gage set-up, simple two-button control, Flip Display, and Reading Indicator Light. www.defelsko.com
Circle 161



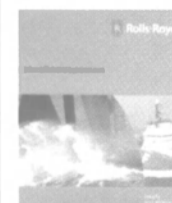
Gold Star Shines Through With Its Coating Line

Gold Star PVD Coatings offer a variety of performance advantages with substantial scratch and corrosion resistance; no UV degradation; and 14 bright metallic finishes in brass, bronze, nickel, gold, black and copper rose that are harder than electroplating finishes and will never fade. www.goldstarcoatings.com
Circle 162



Patch Things Up With Neptune's Syntho-Glass

First used among boaters and blue-water sailors, Syntho-Glass evolved into an ideal product for patching holes, engine hoses and jury rigging. To the experienced boater, as well as the novice, it became known as a "must" to have onboard in case of an emergency. www.neptuneresearch.com
Circle 163



Rolls-Royce Provides Ultimate Power Package

Rolls-Royce has brought together the world's leading names in marine technology to provide innovative solutions to customers around the globe. Whatever and wherever your needs, Rolls-Royce is a major force in marine solutions. www.rolls-royce.com
Circle 164

Leading Societies Launch Sweeping Safety Initiatives

American Bureau of Shipping, Det Norske Veritas and Lloyd's Register have developed a series of initiatives to further improve the safety of international shipping.



ABS is part of a classification trio, which is working to upgrade the safety of international shipping.

The three leading classification societies have agreed on 10 actions that will strengthen the classification profession and make poor quality vessels easier to identify and act upon. The past 12 months have highlighted an apparent weakness in the ability of Classification Societies to respond to critical issues facing the shipping industry. While continuing to support IACS, the three societies will refocus much of their considerable resources on the important quality issues facing the profession and the wider shipping community. The objective of the cooperation is to speed the pace and enhance the quality of decisions in order to meet the expectations and demands for safer shipping.

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Circle 80 on Reader Service Card

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The company is constructing this "Next Generation" Network to provide the maritime community with

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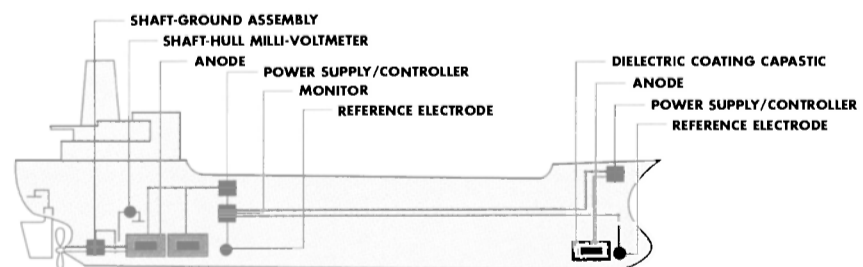
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Furuno's New NavNet Is Compact, Seamless

Furuno has developed a networked bridge, compacted into one convenient unit — the NavNet series. The 7-in. color LCD radar/chart plotters include the 1722C, 1732C and 1742, are space saving, yet packed with innovative features.



Designed to suit myriad of vessels, the 1702C series is part of the new NavNet series of Ethernet networked products. NavNet allows flexibility to create various bridge configurations, including single, dual and tri or quad-stations - utilizing an Ethernet hub.

Completely component based, each unit can take on additional features such as a sounder, GPS, DGPS or a remote depth display - via a single cable, which can then be accessed from any NavNet display. Each unit also features standard NMEA0183 ports that can be connected to other NMEA0183 electronics.

Every NavNet Radar display includes an integral, full-featured chart plotter that can be displayed full screen or split screen with the radar for easy navigation.

A GPS receiver antenna developed specifically for the NavNet system is also part of Furuno's new product base. Incorporating a 12-channel GPS receiver that gives an accurate position fix within two minutes of starting up the unit, the compact, waterproof antenna connects directly to a NavNet display with a single cable.

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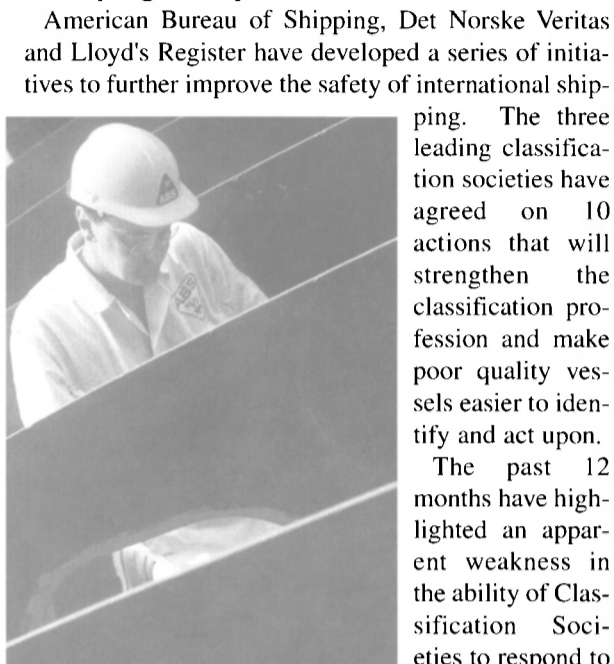


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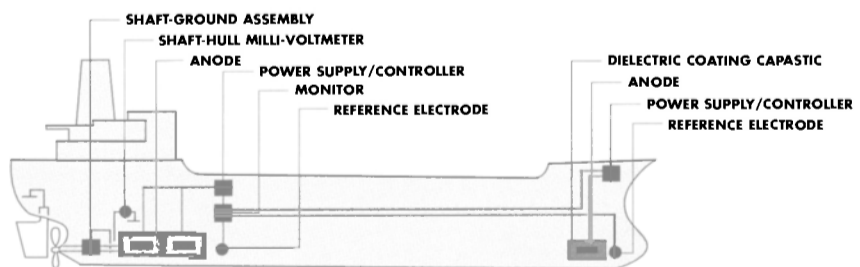
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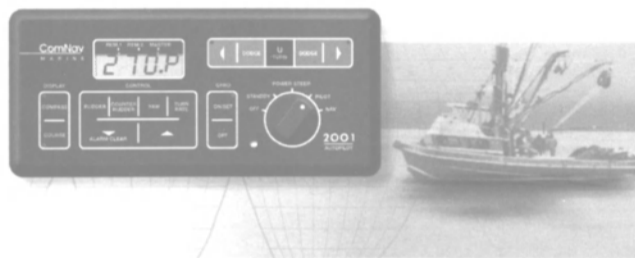


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Furuno's New NavNet Is Compact, Seamless

Furuno has developed a networked bridge, compacted into one convenient unit — the NavNet series. The 7-in. color LCD radar/chart plotters include the 1722C, 1732C and 1742, are space saving, yet packed with innovative features.



Designed to suit myriad of vessels, the 1702C series is part of the new NavNet series of Ethernet networked products. NavNet allows flexibility to create various bridge configurations, including single, dual and tri or quad-stations - utilizing an Ethernet hub.

Completely component based, each unit can take on additional features such as a sounder, GPS, DGPS or a remote depth display - via a single cable, which can then be accessed from any NavNet display. Each unit also features standard NMEA0183 ports that can be connected to other NMEA0183 electronics.

Every NavNet Radar display includes an integral, full-featured chart plotter that can be displayed full screen or split screen with the radar for easy navigation.

A GPS receiver antenna developed specifically for the NavNet system is also part of Furuno's new product base. Incorporating a 12-channel GPS receiver that gives an accurate position fix within two minutes of starting up the unit, the compact, waterproof antenna connects directly to a NavNet display with a single cable.

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Finnish Report

Finland: Cradle of Marine High-Tech

The Finnish maritime market continues to serve the high-tech, high-value end of the marine business with a plethora of engineered solutions and continually evolving marine technology. As the brunt of "series production" shipbuilding (ie. bulkers and tankers) is now firmly embedded in the Far East, dominated by Japan, Korea and China, Finland continues to be a dominating force in specialty markets, most notably cruise shipping.

But the industry today is vastly different from that — even five years ago. Finland has not been insulated from the wave of corporate consolidations engulfing the world. In fact, the status of its two signature yards, the Kvaerner shipyards in Helsinki and Turku, continue to be "for sale." And while the two big Kvaerner yards and Aker Finnyards draw the majority of press coverage, much of their success is directly tied to the army of technologically savvy Finnish subcontractors, small to medium sized companies that have the proven capability to supply cost effective solutions for the home market as well as for export. Regardless of change, however, the glue that binds this small, yet dynamic marine force is technology.

This technology is embodied in the wave of increasingly fantastic cruise liners rolling off the production ways at both the Helsinki and Turku shipyards — the latest being the Carnival Spirit, the second in a line of Panamax Max Spirit ships — as well as in the ever-increasing; the innovative propulsion solutions from ABB industry; as much as it is embodied in the gargantuan strides being taken at diesel engine powerhouse Wartsila. But the soul of Finnish marine tech-

nology is found among the dozens of medium and small-sized organizations that, together with a strong cooperation among government and industry, continue to develop new levels of marine technology.

Making sure that these companies have a voice in the international marketplace falls in the lap of Finpro — formerly called the Finnish Foreign Trade Association — and **Timo Karisto**, who is the new manager of Finpro's marine technology section. During a recent conversation, Karisto noted that FinPro offers Finnish companies a number of tools, including the coordination of a Finland Pavillion a international trade exhibitions, allow smaller companies "who might not be able to come, or would be shoved away in a corner" to clearly communicate the companies product, service and expertise.

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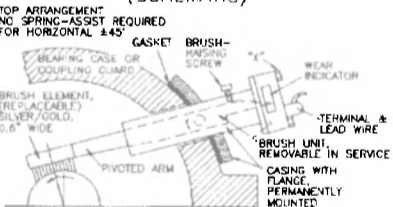
-Working parts are removable during operation.

-Remove screws at "X" to pull entire brush assembly out of brush casing.

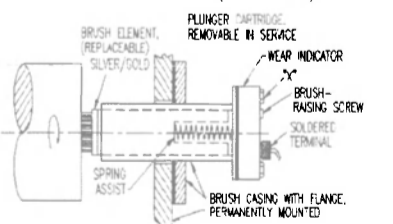
-Brush voltage is insulated from casing, allowing voltage and current monitoring.

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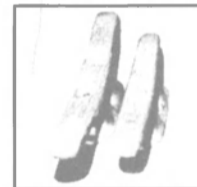
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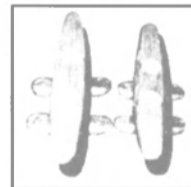


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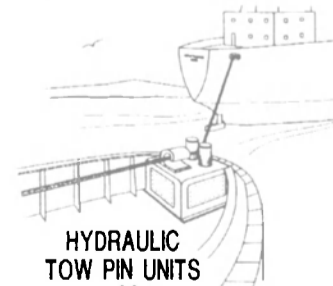
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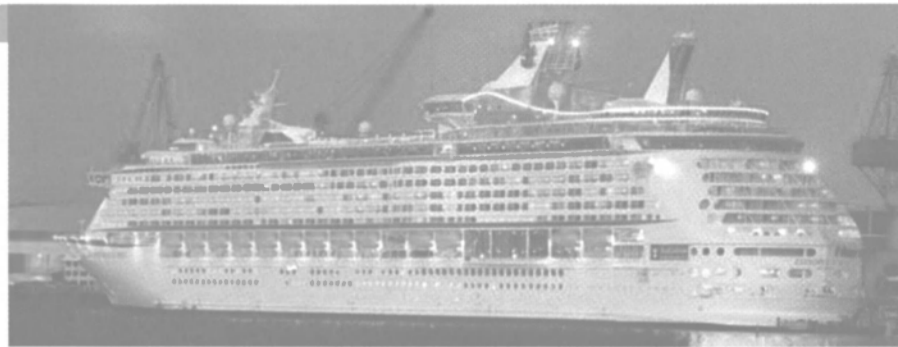
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Finnish Report

Mikael Mäkinen — the man charged with ensuring Wartsila's worldwide market penetration continues to grow — say that the leading diesel engine manufacturer must be less focused on diesel engines. But he quickly notes: "We want to be a ship power supplier ... it's not just about the engine anymore."

Welcome to the marine business 2001. It was not long ago when the marine industry was dominated by product manufacturers. Ten years and dozens of corporate consolidations later have left the marine industry defined by fewer, larger, single-source system providers, complimented by an army of medium



Kvaerner Masa-Yards' Turku Shipyard delivered Royal Caribbean Cruise Lines' Explorer of the Seas last fall.

and smaller-sized product and system manufacturers. Make no mistake though, Wartsila's legendary adherence to a deep and well-funded R&D program helps to ensure that its entire line of products, including the diesel engines, are continually updated to meet and exceed customer demands and needs. But instead of focusing solely on creating an engine with a bigger bore, for example, the company is investing in making the entire propulsion system more efficient, cost effective and maintenance easy.

Mäkinen said the "environmental angle" is the company's competitive edge, and its work on developing smokeless engines, among others have helped to redefine the propulsion sector. (See related report on page 64 of this edition, "Wartsila: Smokeless by Common Rail."). Counting on the company's relationship with propeller manufacturer Lips as an additional step in becoming a single source propulsion supplier, Mäkinen admits "I would say that there is room for further consolidations (in the propulsion sector)."

He said that the idea of a "single source" provider has been popular among shipowners, and he has even found that many of the Chinese shipyards have used the Wartsila service as a marketing tool to attract customers.

And according to Mäkinen, any customer-attracting strategy available will need to be employed in the coming years, as the marine market just finished what he calls a record year in terms of new orders received. The newbuilding pace, he estimates, will cool in the coming years, as deliveries from this year's orderbook hit record highs. But there remain attractive niches.

For example, he notes that there could be a significant influx of new tanker orders, driven by new rules and regulations devised in the wake of recent, high-profile disasters such as Erika. The RoPax market looks poised for strong growth, particularly in Asia. The Asian market has traditionally relied on second hand vessels, but a large number of accidents could spur the ordering of new ships. In addition, he notes that the containership market, driven by growth estimates of seven to eight percent per year, could drive demand for new ships.

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24	ABS	classification society	203	34	John Crane Lips	propulsion systems	274
37	Air Products	marine equip & supplies	204	66	Kahlenberg	airhorns	275
16	Algae X International	fuel filtration	205	75	Kaplan & Associates	propulsion products	276
71	Alstom Power Conversions	drives & controls	206	C4	Karl Senner Inc.	propulsion systems	277
76	Americ Corp	portable ventilators	207	17	King Engineering	tank leveling gauges	278
76	American Vulkan	couplings	208	66	LA. ME. Marine Division	steering systems	279
13	Amfels	event	209	46	Lang Manufacturing	galley equipment	280
38	Anchor Marine	marine equip & supplies	210	52	Lantec/Mac Industries	deck machinery	281
35	Atlantic Marine	shipyard	211	3	Leica Navigation	marine navigation	282
58	Aurand Manufacturing	surface prep tools	212	21	Leslie Controls	valves & controls	283
9	Avtron	propulsion	213	77	Loadmaster International	software	284
23	B F Goodrich	engines	214	75	Louis C. Eitzen Co. Inc.	oil analysis	285
12	BAE Systems	windows & wipers	215	27	Machine Support BV	alignment specialists	286
17	Ballast Technologies	ballast	216	42	MAN B & W Germany	diesel engines	287
44	Bollinger Shipyards	shipyard	218	28	Marco	shipyard	288
30	Brookdale International	survival equipment	219	65	Maritech 2001	trade show	289
40	Carrier Transicold	refrigeration	220	22	Maritel Marine	communications	290
41	Carrier Transicold	refrigeration	222	20	Markisches Werk Halver	engine components	291
56	Centrifuge Services Inc	separators	223	45	Metso Drives Oy	marine gears	292
38	Chris Marine	ship brokers	223	10	Military Sealift Command	employment	293
8	CIMAC	trade show	262	15	Neptune Research	water active pipe repair tape	294
56	Comnav Marine Ltd.	navigation	224	C2	Norges Varemese	event	295
18	Comsat Marine Comm.	communications	225	9	Norma Products Inc.	pipe fittings/cuttings	296
19	Comsat Marine Comm.	communications	226	70	Norwegian Maritime Equip.	monitoring & alarm systems	297
10	Cortland Cable	rope	227	67	Orkot Inc.	bearings	298
16	CSD	pipe sealing	228	2	Parometrics	thickness gauges	299
75	Custom Ship Interiors	interiors	229	37	Philadelphia Resins	coatings	300
55	Damen Shipyards	shipyard	230	64	Propulsion Systems	propulsion	301
60	Datrex	buoys	231	50	Rasmussen Equipment	ship equipment	340
70	DBC Marine Safety	evacuation systems	232	15	Restomotive Laboratories	protective coatings	302
39	Deutz Corporation	engines	233	60	Rice Propellers	propellers/nozzles	303
74	Diversified Metals	metal alloy parts	234	58	Rolls Royce	engines	333
26	Dolphin International	ship fenders	235	14	Roxtec	safety equipment	332
9	Donjon Marine Co.	boatbuilder	236	59	Schottel	propulsion	304
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28	E H O'Neill	decking & flooring	238	75	Sea School	training	306
C3	Eastern Shipbuilding	ship repair/shipyard	239	57	Sea Tel Inc	satellite systems	307
48	E-Crane	cranes	240	5	Seabulk Systems	bulk materials handling	308
27	Electronic Marine Systems	sensors	241	24-5	Seaward Int'l	fenders	309
29	Electronic Marine Systems	sensors	242	59	Shave Away	maintenance tools	310
31	Electronic Marine Systems	sensors	243	59	Siemens AG	automation systems	311
33	Electronic Marine Systems	sensors	244	52	Silex Inc	silencers	312
28	Elomatic Oy	consulting & Engineering	245	76	Skookum	deck machinery	313
47	Envirovac	vacuum systems	246	2	Smith-Berger Marine	deck hardware	314
20	Euro-American Marine	cables	247	68	SNAME	trade show	316
26	EuroCom Industries	communications	248	75	Sohre Turbomachinery	grounding brushes	382
37	Ferro Corporation	epoxy repair system	249	65	Stork-Kwant	universal telegraphs	317
60	Frank L. Beier Radio	integrated vessel control	250	60	Superbolt	bolts & fasteners	318
11	Furuno	radar equipment	343	37	Superior Energies, Inc.	insulation manufacture	319
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62	Harbormaster	propulsion systems	258	49	Tranter	heat exchangers	325
50	Harrington Marine	kort nozzles	259	73	U.S. Filter/Electrocatalytic	corrosion control	326
16	Harris Communications	communications	327	1	USMMA	merchant marine academy	328
58	Hatlapa Vetersener	deck machinery	260	13	Van Hall Health	medical management	329
56	Headhunter	sanitation systems	261	75	Vernon Corporation	marine hardware	330
62	Hike Metal	boat builder	383	52	Vessel-Net.com	software/info. Systems	331
43	Hopeman Brothers	interior design	263	50	Viking Life Saving	life saving equip.	321
74	Houston Marine	marine training services	264	37	Ving Card	locks	322
17	Houston Marine	marine training services	265	37	Volmar	ultrasonic homogenizers	323
77	IMA	business reporting	334	61	Wartsila Corporation	propulsion	324
17	In Place Machining	crankshaft repair	266	31	Washington Chain	cleats	325
59	Intercontinental Engineering	deck machinery	267	27	Water Weights	lifting equip. testing	326
7	Izar	shipyard	268	16	Waterman Supply	marine equip. & supplies	327
36	Jamestown Metal Marine	interiors	269	75	Western Machine Works	tractor pins	328
31	Jan Verhaar Omega Thrusters	thrusters	270	52	Wynstruments Ltd.	wind screens/wipers	330
69	Japan Radio	communications	271	51	Z F Padova	propulsion	342

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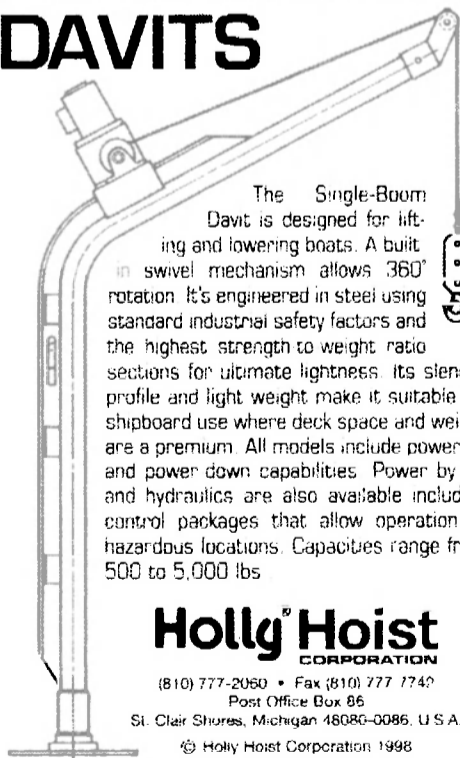
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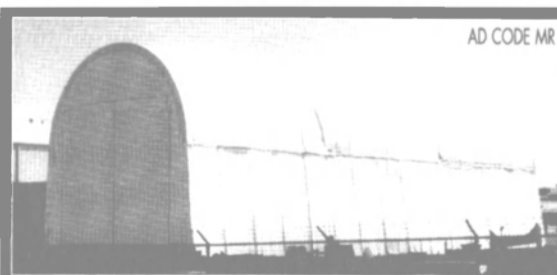
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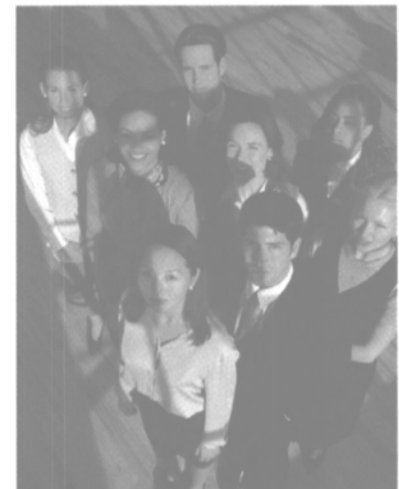
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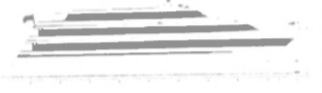
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www.dejongandlebet.com

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