

June 15, 2000

MARITIME REPORTER AND ENGINEERING NEWS

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World

Yearbook

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- Dry Bulk Carriers
- Containerships
- Tankers
- U.S. Marine Industry
- Ship Repair

Crew Boats: Bigger, Faster & More Powerful **E-Commerce: Marine Industry Dives Head First Into Cyberspace** **Rod McLeod: Lifetime of Hard Work Pays Off** **Rolls Royce: True Consolidation of Marine Power** **Going Deep: Astano Prepares "Discoverer" for Service** **Legal Beat: A Practical Discussion on Compliance**



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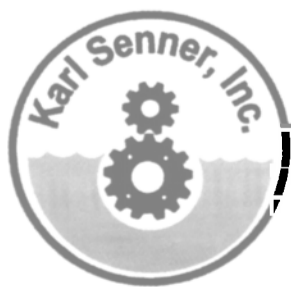
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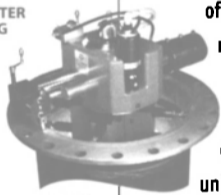
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On the Cover: (Photo Credit: Walter Garschagen - 1996)

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Spain's Astano has completed the last in the Discoverer series, a trio of ships that are helping to redefine possibility and profitability in deepwater operations.— by **Greg Trauthwein**, editorial director

8 On A Roll

Rolls Royce has successfully scooped up a number of marine propulsion manufacturers, and is positioned to prosper in many markets. — by **David Tinsley**, technical editor



The World Yearbook

33 Nice Guys Finish First Rod McLeod has built a two plus decades career atop the cruise industry on hard work. Associate editor **Regina Ciardiello** finds that he thoroughly disproves the notion that nice guys finish last.

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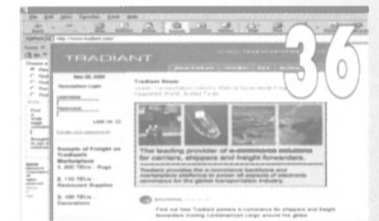
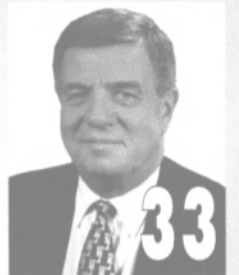
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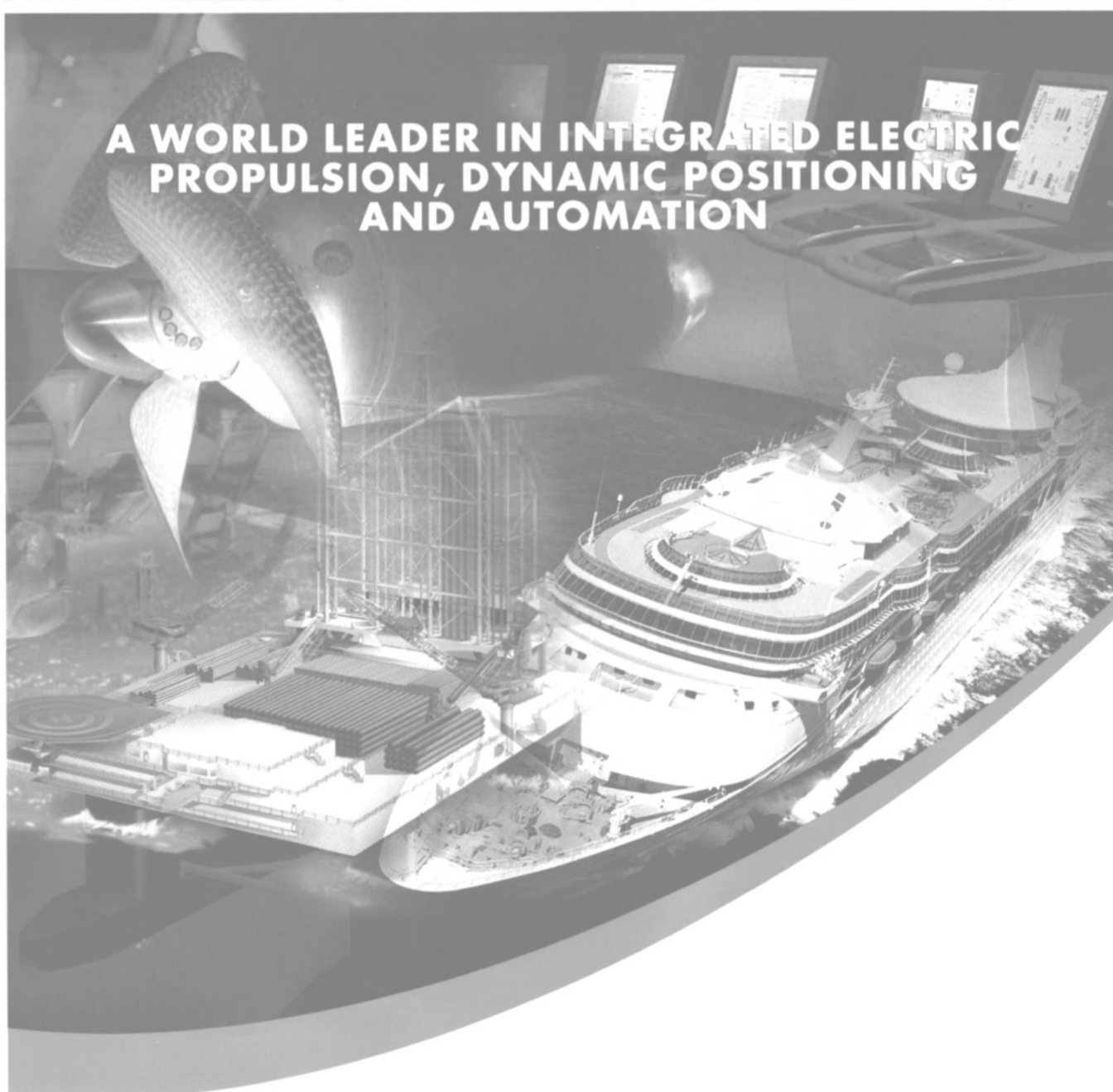
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Editor's Note

This edition of our annual World Yearbook mirrors the changes sweeping the maritime markets within which you operate. While there are traditional departments and sections with which you have become accustomed to and comfortable with, there is also a good deal of space dedicated to extolling the values of emerging e-commerce technologies, a topic that I'm reasonably sure is far from the theoretical comfort level enjoyed by many owners and operators in the domestic and international maritime markets.



The dot com craze, which has swept consumer markets in the U.S. and abroad has fully infiltrated the maritime niche, and there is currently a staggering rush by companies large and small, far and wide — both oozing with maritime experience and others utterly bereft of it — to gain and maintain market share. To those that have been plugged into the Internet for the past five years, this is hardly news. However, there is a noticeable difference in both the sheer number of companies as well as the complexity of the products they are producing. While the number of current choices can more often than not lead to confusion — much as has happened in consumer markets — if current business winds prevail, the picture will crystallize in the next 12 months.

The world maritime market continues its march towards consolidation, a trend which has been prevalent for more than five years now. Whether the topic is diesel engine suppliers, tug and towboat operators or electronic product and system providers, the scenario is familiar: today there are fewer, larger companies dominating the market. A perfect example of this trend is Rolls Royce, which has consolidated a number of marine propulsion brand names under its considerable umbrella. Technical editor David Tinsley reports on the company and its recent maneuvers in his Investment in Design column, found as always on page eight. It is reasonable to assume then that the e-commerce side of the business, although still in its infancy, will also follow this trend.

Expect in the next year or two to see a significant shake out and consolidation among e-commerce products and players, with the current market of several dozen individual companies becoming the reality of fewer, larger competitors. While it is impossible to foresee the future of individual organizations at this time, it is similarly a good bet that well-financed organizations, which feature personnel with considerable industry insight, knowledge and experience to match the company's technical expertise will prosper. *Maritime Reporter's* editorial coverage of this business revolution will continue to increase as well, as each month a different e-commerce solution will be featured in our pages. This month, our coverage of e-commerce starts on page 36.

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Vessel of the Month

Astano's 'Discovery' Series Uncovers Unlimited Potential

by Greg Trauthwein

The last in a series of innovative, next-generation technology drillships left the building ways of Astilleros Espanoles' Astano yard recently, heading for a neighboring shipyard for final fitting of its six massive Aquamaster thrusters. Discoverer Deep Seas, at the time of visit to tour the ship in Ferrol, Spain in



Santiago Garcia,
Astano's md

early May, was dockside in nearby Bazan for the task of placing its six propulsion units, as task made easier by Bazan's deeper water facilities.

Discoverer Deep Seas, along with its sister ships Discoverer Enterprise and Discoverer Spirit (the former named MR/EN's Great Ship of 1999), embody not only the latest in drillship technology, but is a clear indication of the Spanish marine market's adherence to technical excellence and building prowess, particularly in the face of lower cost, subsidized competitors in the Far East.



Luis A. Mendez,
commercial director

Discoverer Enterprise — delivered in late 1998 — and its two sisterships are Ultra Deepwater (10,000 ft.) Dynamic Positioning Drilling Units which are literally loaded with a bevy of advanced marine propulsion, and electronic products and systems, which qualify them as some of the most advanced tonnage built. Measuring 834.5 x 124.5 x 62.5 ft. (254.4 x 38 x 19 m), the ship is a virtual floating, working community, dedicated to recovering resources from some of the most remote areas ever ventured by man.

The heart of the vessel, arguably, is an Integrated Automation System (IAS), which is used to provide control and monitoring of the vessel marine and safety systems. The Bridge/Control Room is the primary control center, staffed and located within the accommodation module. As the very nature of the business of these high value ships is that of potentially dangerous situations, critical systems feature redundant central process

units within process station. Additionally, the system can be subdivided in the following systems: Vessel Management; Power Management; Thruster Control and Dynamic Positioning; Extended Wheel Test Control; Drilling

Automation; and Fire & Gas Emergency Shutdown.

The Dynamic Positioning (DP) system consists of six 5,000 kW variable speed azimuthing thrusters; three forward and three aft. The DP systems, which is

called on to keep the massive 45,754-gt vessel on station and productive during raucous sea conditions, is assigned the DNV Class Notation DYNPOS AUTR. To ensure operation in the event of fire or flooding, one thruster in the forward and one in the aft is segregated.

(Continued on page 32)

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Rolls-Royce



A recent clutch of 'Rolls-Royce' shipboard equipment and technology contracts in Norway arising out of specialized, capital-intensive newbuild projects testified to the U.K. group's march into the commercial marine domain.

For sure, the emergence of the engineering group's name in new mercantile circles is the outcome of last year's acquisition of Vickers, and its Vickers-Ulstein Marine division, rather than the result of U.K. home-grown product diversification. But the new proprietor of the former Ulstein and Vickers' interests intends to build on the platform and integrated system opportunities offered by ownership of the industry's most extensive global network of marine equipment production.

Just as the takeover signaled Rolls-Royce's determination to enlarge its marine power business, the readiness of the absorbed companies to use the Rolls-Royce brand identity says something about the latter's standing in its established areas, especially the civil

aerospace and military markets.

The various Ulstein and Vickers group businesses in propulsion systems, propellers, thrusters, waterjets, pods, steering gear, motion control equipment, deck equipment, control systems and marine design have been brought into the fold to complement Rolls-Royce's existing gas turbine and diesel power activities. As a consequence of the \$848 million purchase, spurred mainly by the prospect of sustained growth in the marine business, the organization claims to be the largest supplier in its field.

Bob Sunerton, managing director of marine business at Rolls-Royce, said "The acquisition of Vickers will enable us to meet customers' changing requirements, offer a broader product range, and supply a fully integrated power systems capability." The company will address what it quantifies as a marine market worth \$60 billion over the next 20 years, with the next five years expected to account for \$25.5 billion of that. It reckons on marine market

growth of four percent per annum, with power systems accounting for 15 percent of the market value. "As the trend towards fast ships and special applications determines high technology equipment, the proportion of value attributable to the power system will grow — over a number of commercial market sectors," said Sunerton.

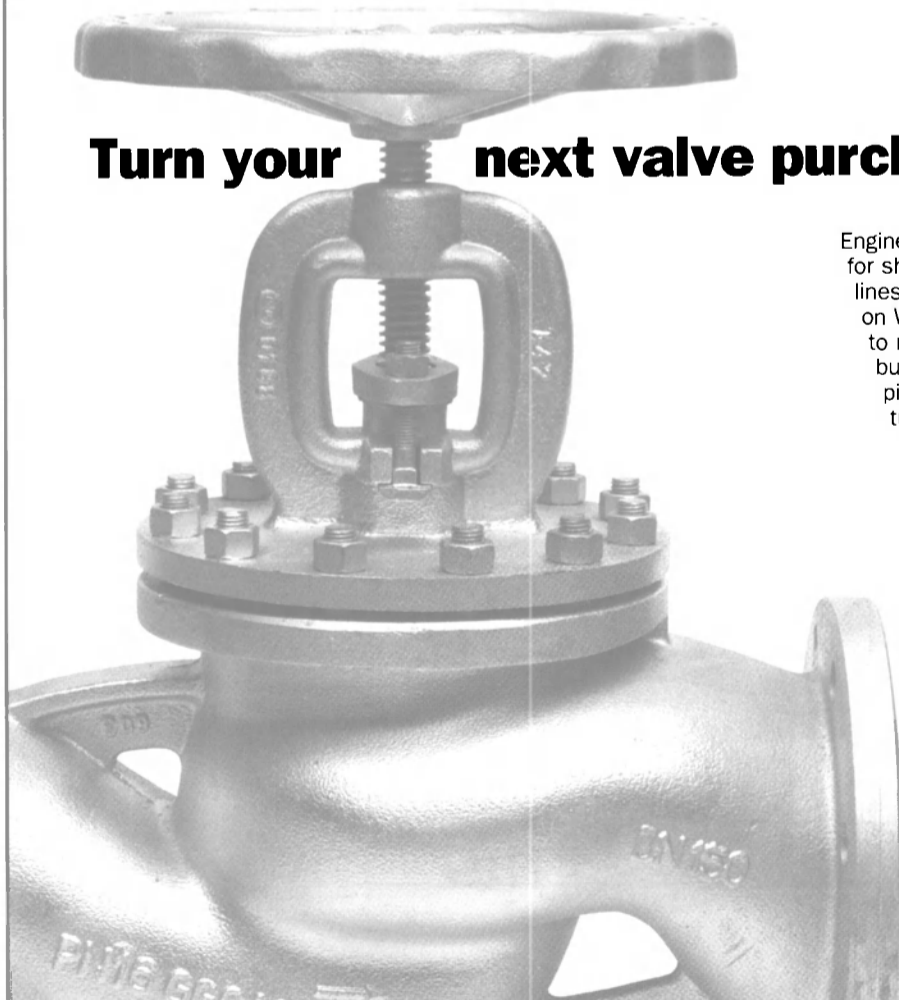
Besides the all-important naval business, Rolls-Royce is focusing on higher-value vessels for its drive in the commercial field. The accent is on offshore support and service vessels, cruise ships and ferries, and other specialized tonnage. In addition to a generic-type concentration, the focus will also be on system or 'package' solutions. "A market driven approach also benefits ship operators by offering dedicated solutions for integrated system packages and through-life product support," confirmed Sunerton, who also underscored the group's intention to continue to seek ways in which to develop its integration capabilities.

by David Tinsley, technical editor



Bob Sunerton, MD Rolls-Royce, (center), flanked by **David Price** (left), who heads up the Naval business, and **Morten Ulstein** (right), who is in charge of the company's commercial businesses.

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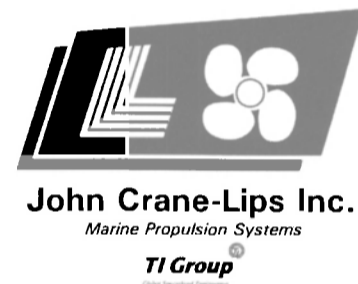


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Investment in Design

While the Ulstein Bergen and Allen ranges give Rolls-Royce a presence in the medium-speed diesel market over the 3-MW to 9.5-MW band, the core business standing in aeroderivative gas turbines takes the group's scope for unit

power ratings beyond 50-MW.

Realization of the long-mooted FastShip transatlantic cargo vessel project, in which each vessel would be installed with five Rolls-Royce Trent engines, would provide an enormous boost to the

marque in the emergent market for large fast ferries and very large naval platforms. FastShip would also showcase the largest waterjet design from one of the most prized elements of the Vickers' acquisition, the Kamewa.

Vickers' had completed its \$447.5 million purchase of Ulstein Holdings in May 1999, to be quickly followed that September by a Rolls-Royce cash offer for Vickers, finalized in December. The process of rationalization and streamlining set in train after Vickers' bought the Norwegian-controlled group will now be taken a stage further under the Rolls-Royce ownership.

What this will bring remains to be seen, but the combination of Ulstein Bergen and Allen diesel ranges will be one outcome. The integration of interests reflecting the earlier conjunction of Ulstein and Vickers is already evident in the adoption of product range names such as Ulstein Aquamaster azimuth thrusters, Kamewa Ulstein controllable pitch propellers and Rauma Brattvaag deck machinery.

While the FastShip program provides an outstanding, but as yet conceptual reference, American Classic Voyages' newbuild scheme represents one of the most prestigious commercial marine

projects in the U.S. involving Rolls-Royce group-supplied equipment. Each of the 72,000-gt luxury cruise ships from Ingalls, the first large passenger vessels to be built in the U.S. in more than 40 years, will be installed with two 12.5-MW Kamewa Mermaid podded propulsors. Under the newly-created structure for the Rolls-Royce marine business, overseen in its entirety by Sunerton, naval activities have been put under the aegis of managing director **David Price**, while the commercial sector is headed by managing director **Morten Ulstein**, previously chief executive of Vickers Ulstein Marine Systems.

Marine capabilities have been organized into seven market segments, so that each customer's particular needs can be directly addressed by specialist teams in terms of vessel design, engines, propulsion equipment and deck machinery. As a proven innovator, Rolls-Royce can be expected to continually invest in its expanded, chosen fields of technology in the coming years. Its track record in driving down unit costs while expanding business volume in high-value fields is graphically demonstrated by the growth it has achieved in aero engine market share over the past 12

They Said It ...

Quotes excerpted from an article on Rolls Royce as published in the June 20, 2000 edition of Marine-News.

"We still need what we need. If engineering tells us to get a Caterpillar engine, we'll get a Caterpillar engine. I can see where the consolidation would be good, and where it wouldn't be. Certainly, there's the standpoint of better worldwide distribution than you would ordinarily have. To us, anything that increases distribution and ready-access to materials, and hopefully results in a financial savings, is certainly a good thing." — **Ron Ross**, director of purchasing for Hvide Marine

"I guess the negative effects of the big mergers is the total confusion that ensues until they get everything sorted out. No one is ever quite sure of what everyone else in the company is doing, and it takes a while to get everything straightened out. In the past, when I wanted an Ulstein winch, I knew who to call; when I wanted an Aquamaster winch, I knew who to call. Now, they're both owned by the same company, and, until things are straightened out, I don't know who to call. On the positive side though, once things are sorted out, there are times I'm only making one phone call. When you've got a fleet with lots of different pieces of equipment, you used to know you'd be in for a long day of phone calls when ordering equipment from all the different manufacturers. Now, that time has been reduced dramatically." — **Tom Denning**, vice-president of engineering for Hvide

"In terms of propulsion, we only had one situation where we had a pre-existing quote from MTU North America, prior to the merger between MTU, Penske and Detroit Diesel. After the merger, we had to negotiate with Detroit Diesel for awhile, and then eventually the talks fell through. We ended up asking MTU if we could work directly with them. On the other hand, recently there was a smaller electronics firm we worked with that was purchased by Hose-McCann. We'd had problems with the firm in the past, mainly because it was a pretty small firm. Once Hose-McCann entered the picture, it was able to get the smaller firm past the problem areas they were running into. As long as the parent company can bring a greater amount of resources to the mix, the effect on us should be positive." — **Dennis Fanguy**, technical director of Bollinger Shipyards



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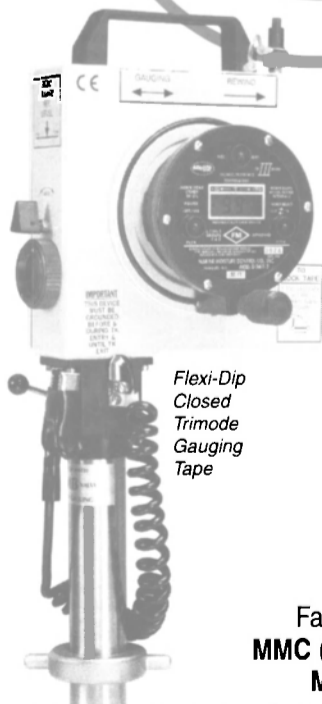
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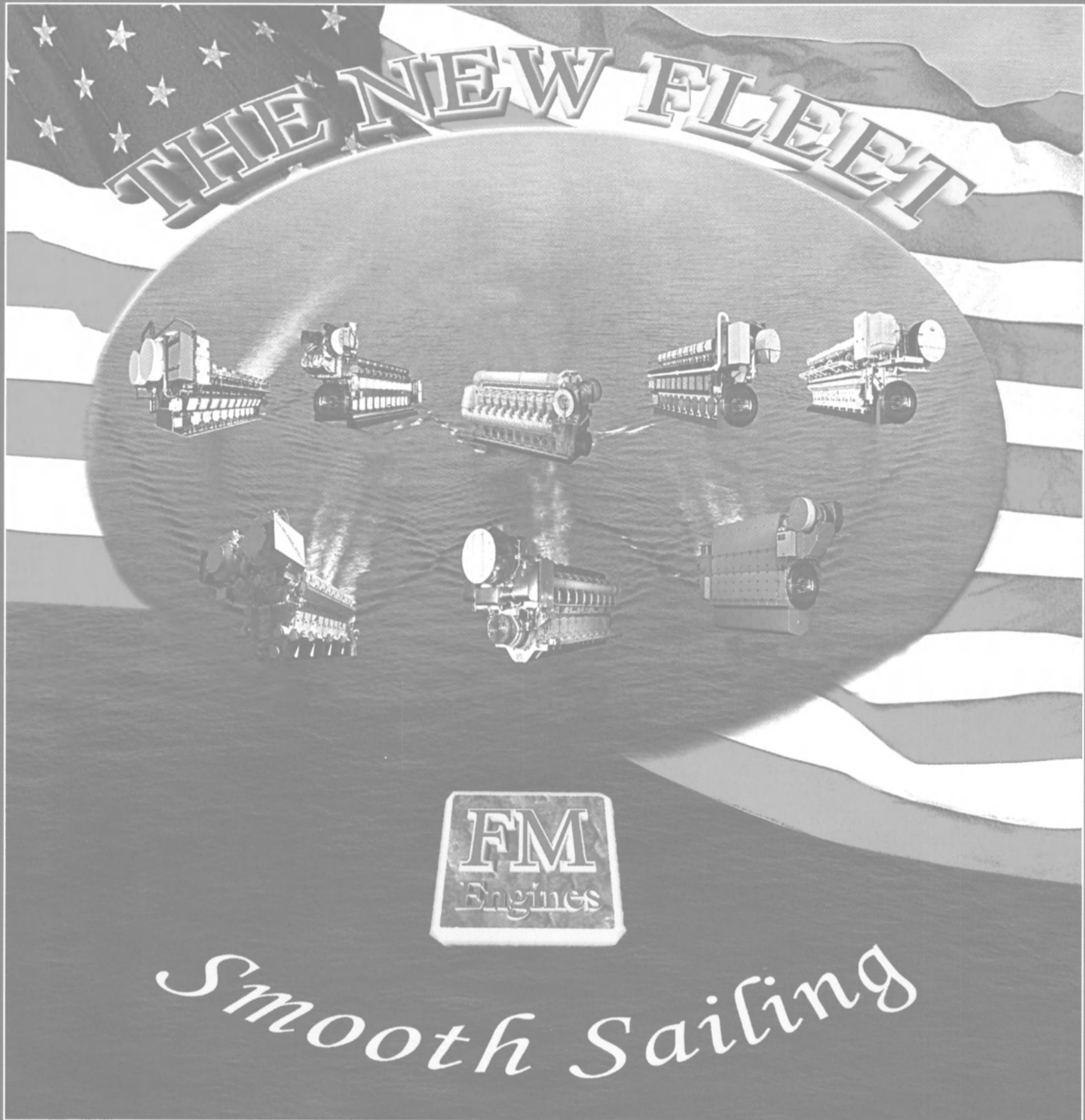
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Investment In Design

years, from eight percent to 35 percent.
Italian platform for electric drives

Italy's private shipowning sector, fundamentally concentrated in relatively small or family-owned businesses, continues to demonstrate both resilience and flair, and a receptivity to new design and engineering concepts. In the latest

demonstration of a holistic and far-sighted approach to newbuild powering, Savona-based Finbeta has endorsed diesel-electric propulsion in a new chemical tanker application.

The Finnish-developed system involved, distinguished by its elimination of the usual need for propulsion

transformers, was selected by virtue of a clutch of cost, efficiency, operational and space- and weight-saving benefits. It was only chosen after detailed evaluation of the various powering options, starting with consideration of a typical, diesel-mechanical configuration.

Constructed at Ancona by Cantiere

Navale Morini, the 12,000-dwt Turchese provides a new platform for the ABB system based on two 3,300-kW PWM (Pulse Width Modulation) drives. PWM technology, whereby frequency converters control sturdy, standard induction cage motors, offers system simplicity, reliability and efficiency factors, maximum torque in either direction and other operational plus factors such as an exceptionally high power factor, soft start and smooth control. Hitherto, the concept has been mainly employed in the marine environment on offshore vessels and cablelayers.

Finbeta runs a modern fleet of ice-classed, IMO type II stainless steel chemical/parcel tankers, and the ice-classed Turchese has started life in the North European and Baltic petrochemical trade.

Horizon To Build OSV Trio

Horizon Shipbuilding and SLOK Nigeria Limited have signed contracts for the construction of three offshore vessels — all of which will operate under a long-term contract with Mobil Producing Nigeria Unlimited.

The contract calls for Horizon to build a 200 ft. (61 m) steel Single Point Mooring (SPM) Oil Spill Response Vessel with a total of 4,000-shaft hp.

The vessel will be fitted with controllable pitch propellers and a dynamic positioning system, and will be constructed to ABS class requirements for unrestricted service, thus meeting all SOLAS requirements.

A second contract calls for Horizon to construct two 155 ft. (47.2 m) aluminum crew boats for SLOK Nigeria. The vessels, which total about 4,000-shaft hp, will be driven with five propulsion shafts. The crew boats will carry 95 passengers, liquid cargo and a deck load of 180 tons. In addition, Horizon Shipbuilding formalized a contract with Dixie Towing, Jacksonville, Fla. for the construction of a 70 ft. (21.3 m) Z-drive tug. Designed exclusively for Dixie by Glowacki Engineering, also of Jacksonville, tug is scheduled for a fall 2000 delivery.

Circle 69 on Reader Service Card

NOL Group Subsidiary

Contracts New Tankers

The NOL Group reported that its wholly owned subsidiary, American Eagle Tankers (AET), has contracted two new double hulled very large crude carriers (VLCCs) to be constructed by Hyundai Heavy Industries of South Korea.

The new tankers will become part of AET's current 18-member Aframax fleet upon their delivery in 2002.



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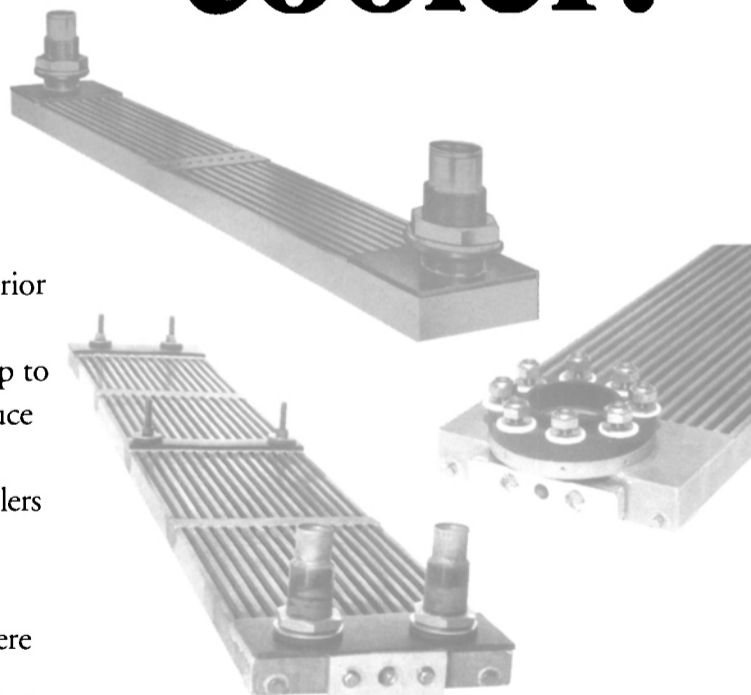
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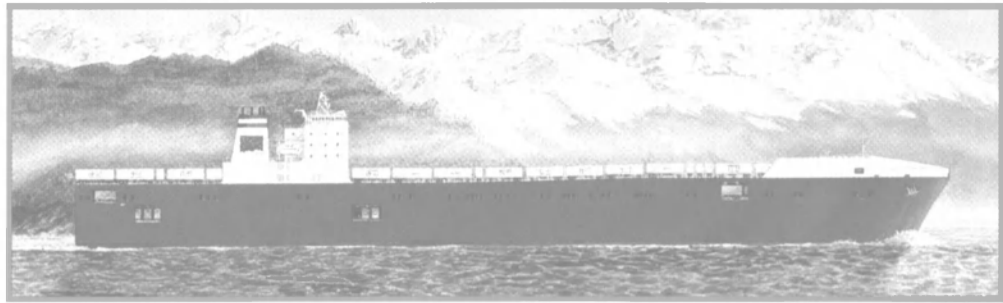
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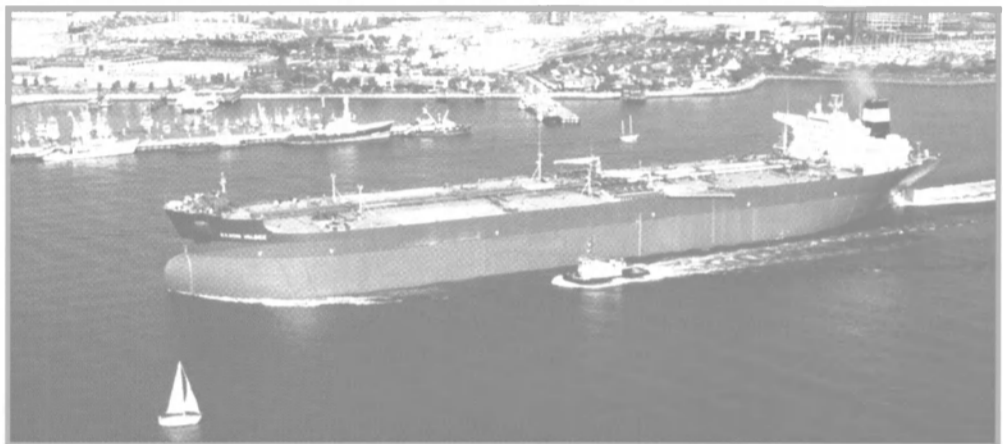
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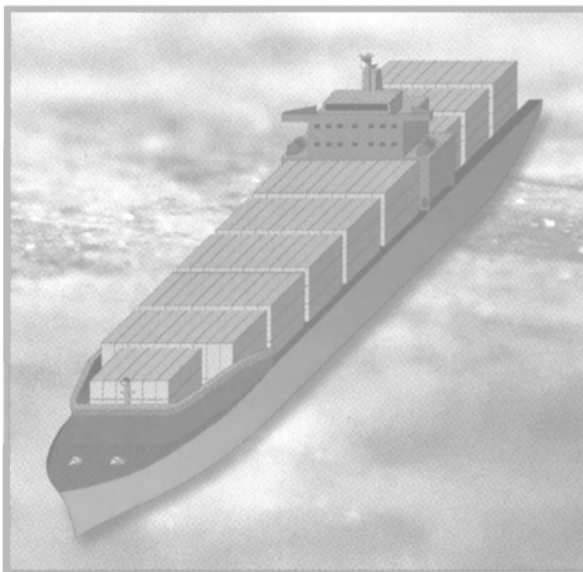
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NASSCO has been awarded a contract from Totem Ocean Trailer Express, Inc. (TOTE) to build two roll-on, roll-off trailerships. NASSCO created a unique design for these new ships, tailored to TOTE's specialized requirements for the rigors of Alaskan service.



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Legal Beat

A Practical Discussion Regarding Compliance

Maritime businesses are increasingly becoming the subject and target of federal criminal investigations. This is due, in part, to the increased emphasis on the enforcement of the criminal provisions

of labor, customs and environmental regulatory provisions. A federal investigation of a business or corporation typically begins with federal agents serving a grand jury subpoena requiring the

business to produce corporate records and documents. The subpoena requires that the business undertake a diligent and thorough search for the documents called for by the subpoena. Typically,

the subpoena will also require that the business present a custodian of records to the grand jury to testify as to the process employed to search for and gather responsive documents in order to satisfy the prosecutor that the company has produced all documents called for by the subpoena.

Recent Legal Development

A business or corporation is required to turn over all documents that are not privileged — including documents that reveal your wrongdoing. A corporation does not have a Fifth Amendment privilege to refuse to produce documents in response to a grand jury subpoena on the grounds that the documents would tend to incriminate the corporation. Likewise, under the "collective entity doctrine," officers and employees of the corporation cannot assert a personal right and decline to produce corporate documents in their possession on the grounds that the documents would tend to incriminate them. Recently, however, the federal appellate for the Second Circuit clarified the rights of former officers and directors to refuse to produce corporate documents. The court held that three former officers of a corporation had a Fifth Amendment Right to refuse to produce corporate documents in their possession.

An individual may claim an act of production privilege to decline to produce documents, the contents of which are not privileged, where the act of production is, itself: (1) compelled; (2) testimonial; and (3) incriminating. The Supreme Court has held that a current employee is precluded from claiming an act of production privilege. A current employee cannot claim a Fifth Amendment act of production privilege to refuse to produce corporate documents even though the documents might provide the government with evidence that could incriminate him. *See Braswell v. United States*, 487 U.S. 99, 108 S.Ct. 2284 (1988). While a current employee is not entitled to raise the Fifth Amendment as a shield against producing documents, there is a mitigating evidentiary privilege to reduce the risk that the individual will incriminate himself in the course of producing such documents. The government is precluded from using the act of production as evidence against the individual. A current officer and employee have no Fifth Amendment privilege to refuse to produce corporate documents on the grounds that the act of production itself would tend to incriminate him. The question that has remained unanswered, until recently, was whether former employees had any right to decline to produce corporate documents in response to a grand jury subpoena.

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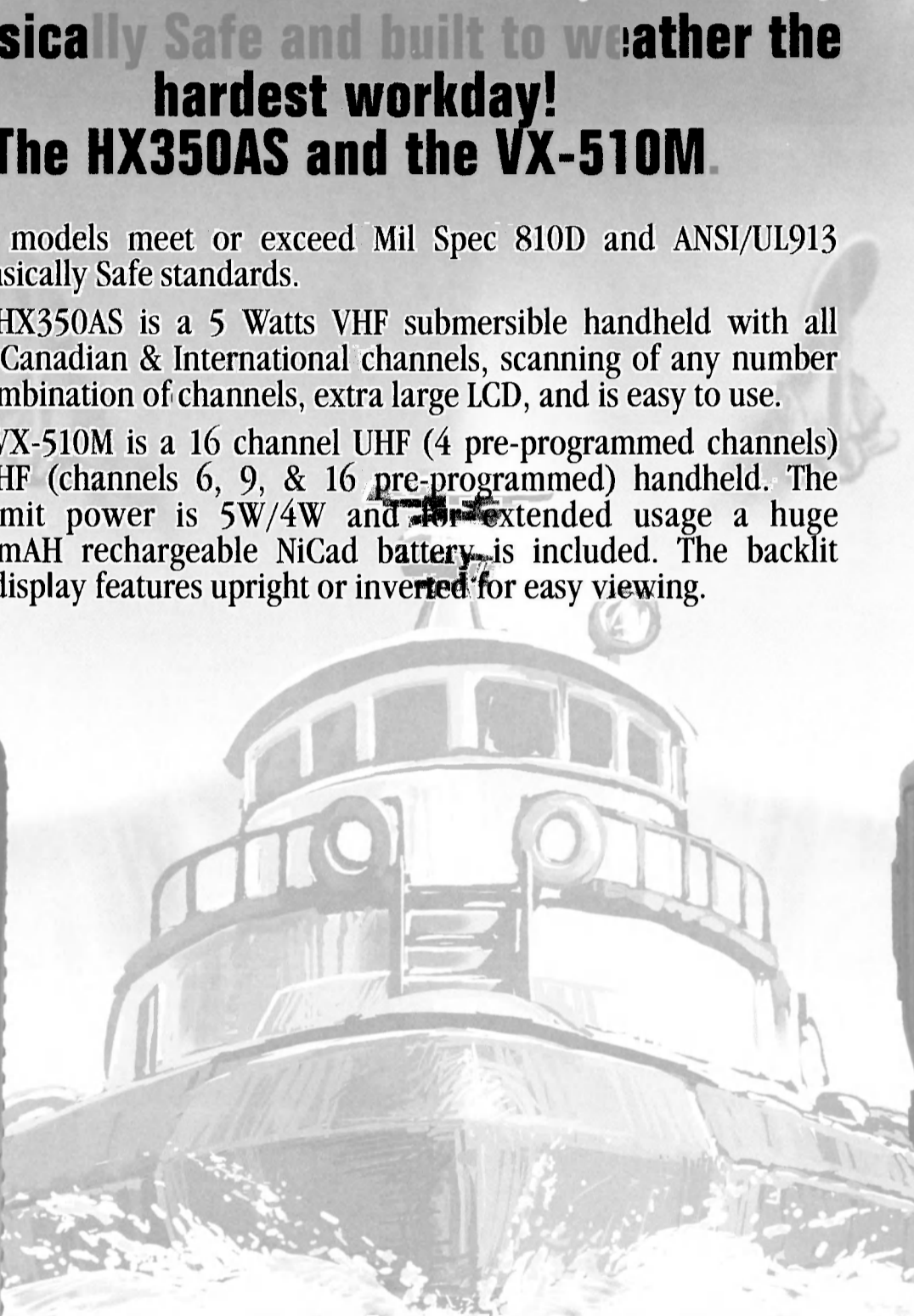
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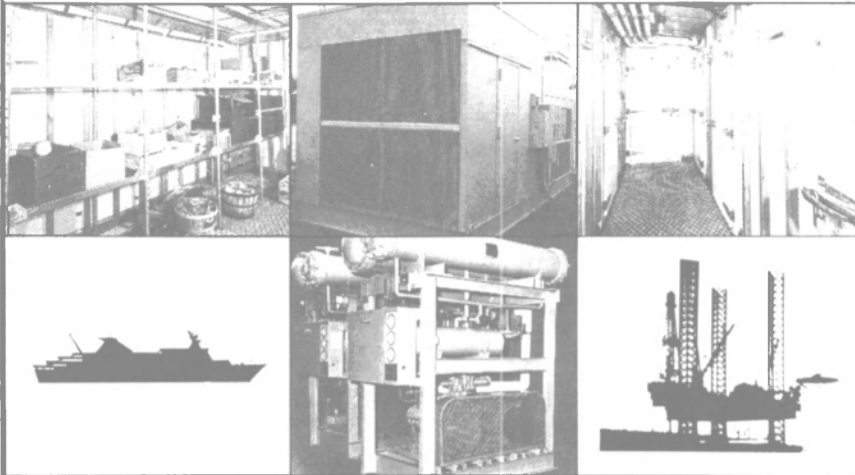
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Legal Beat

The federal court of appeals is divided on this issue. The Third and Ninth Circuits have held that former officers of a corporation have a Fifth Amendment Right to refuse to produce corporate documents in their possession after they terminate their employment. The federal court of appeals for the Eleventh Circuit and District of Columbia district court has held that they do not.

In the case of *In Re Three Grand Jury Subpoenas Duces Tecum Dated January 29, 1999 v. Doe*, 191 F.3d 173 (2nd Cir. 1999), federal prosecutors sought to enforce subpoenas for documents issued by a grand jury in the Southern District of New York in connection with a criminal investigation of a corporation and its employees. The government alleged that the targets of the investigation falsified the corporation's books and records and misapplied funds in the corporation's custody. In connection with this investigation, in June, September and October of 1996, the grand jury issued subpoenas to the corporation for records related to the investigation. The September subpoena was broad in scope and covered virtually all of the conduct ultimately investigated. The October subpoena supplemented the September subpoena and set forth two additional document requests. Two individuals, Doe One and Doe Two were corporate officers when all three grand jury subpoenas were served on the corporation and during the time in which the corporation responded to the subpoenas. In connection with the corpora-

tion's compliance with the subpoena, an attorney for the corporation met with Doe One and Doe Two separately and requested that they produce responsive documents. Both individuals produced some documents, but were alleged to have retained others. By July of 1997, both individuals had left the corporation's employment. A third individual, Doe Three resigned from the company in mid-July 1996, after the June subpoena was issued and served. The corporation's attorney attempted to contact Doe Three to inquire whether she had responsive documents, but was unable to do so.

In January of 1999, the government discovered that a former company employee had in her possession incriminating corporate records that were responsive to the 1996 subpoena but were not produced by the corporation. The government then served a fourth grand jury subpoena on twelve former employees, including Doe One, Doe Two and Doe Three requesting that they produce documents relevant to the investigation.

Nine of the twelve former employees produced documents responsive to the subpoena. Doe One, Doe Two and Doe Three refused to produce any documents and asserted a Fifth Amendment privilege against requiring them to produce the documents. The government argued that the documents requested were corporate documents and that the three individuals remained corporate custodians even though they had left the corporation. The government requested that the district court order these individuals to produce the documents. The district court denied the government's motion and held that the act of production by an individual who is no longer employed by the corporation is self-incriminating and, thus, not permitted by the Constitution. The government appealed.

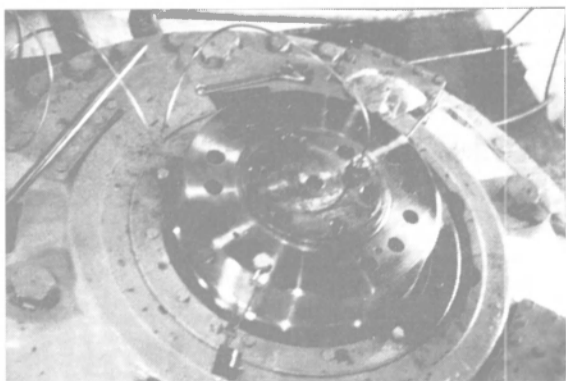
The court of appeals affirmed the district court and applied the act of produc-



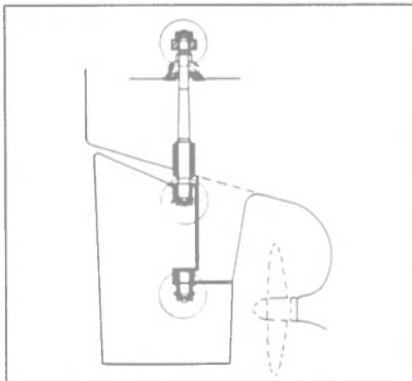
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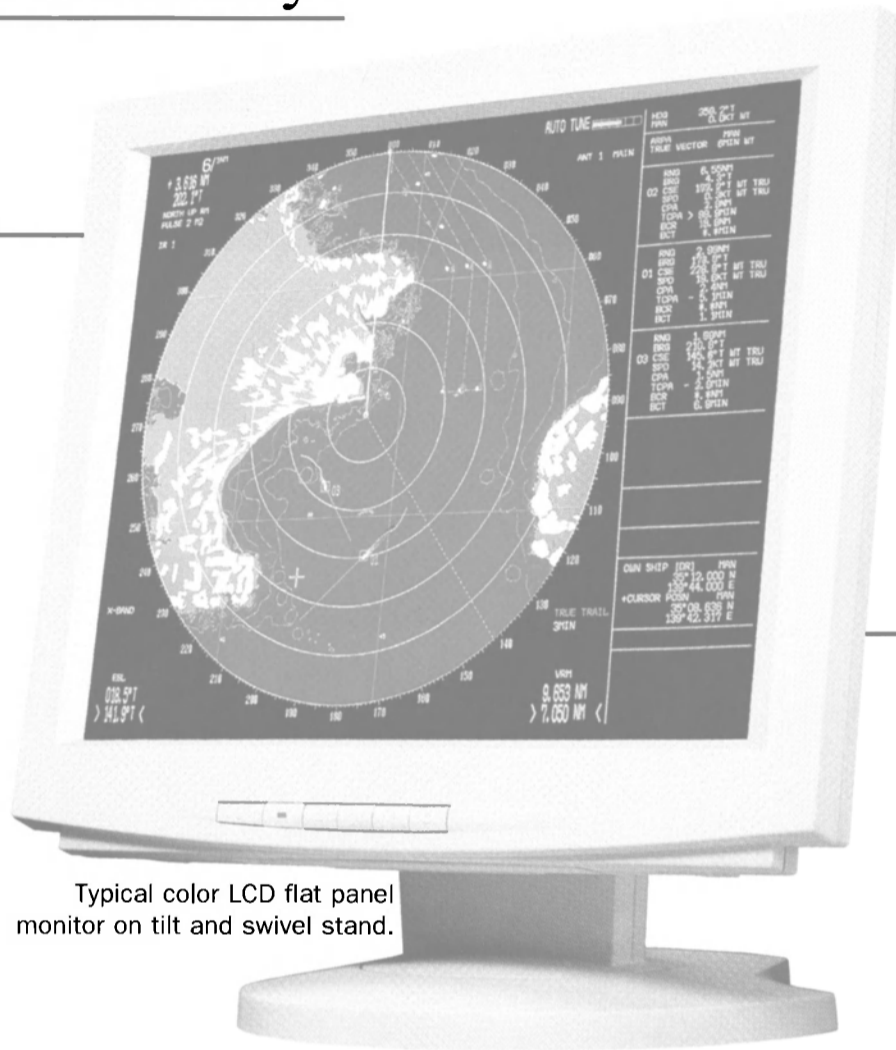
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Legal Beat

tion privilege under the Fifth Amendment to former employees holding corporate documents. The court reasoned that after an individual leaves a corporation, he no longer is a custodian for any corporate document and any act of producing documents in response to the grand jury subpoena would be an act in

an individual capacity. The court pointed out, however, that the government is not left with recourse to recover the documents in possession of a former employee. The government is free to seek and obtain a search warrant to recover the documents without compelling their production by the person in

possession.

Conclusion

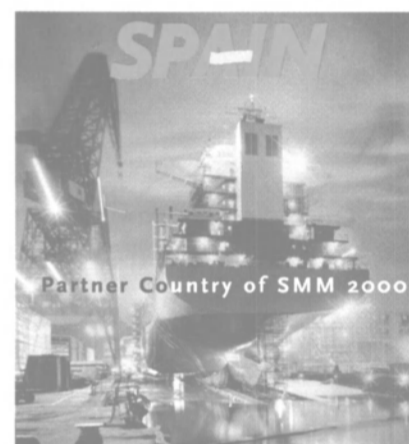
Complying with a federal grand jury subpoena requiring the production of documents is a serious undertaking. Thus, a diligent and complete effort should be made to locate documents

responsive to the subpoena. The failure to do so may expose the business to a civil contempt sanction or a criminal contempt conviction.

The preceding was authored by Thomas M. DiBiagio, Dyer Ellis & Joseph, Washington, D.C.

Spain Chosen As Partner Country of SMM 2000

The Instituto Espanol de Comercio Exterior, ICEX, (Spanish Export Institute) will bring together more than 50 companies in the Shipbuilding, Machinery & Marine Technology International Exhibition (SMM Hamburg), in the



biggest ever Spanish representation in a tradefair of the marine sector.

Spain is to be the official Partner Country at SMM, widely regarded as the most influential ship machinery exhibition in the world. Its exhibitors in 1998 came from 42 countries and attracted over 36,000 visitors from 50 different countries.

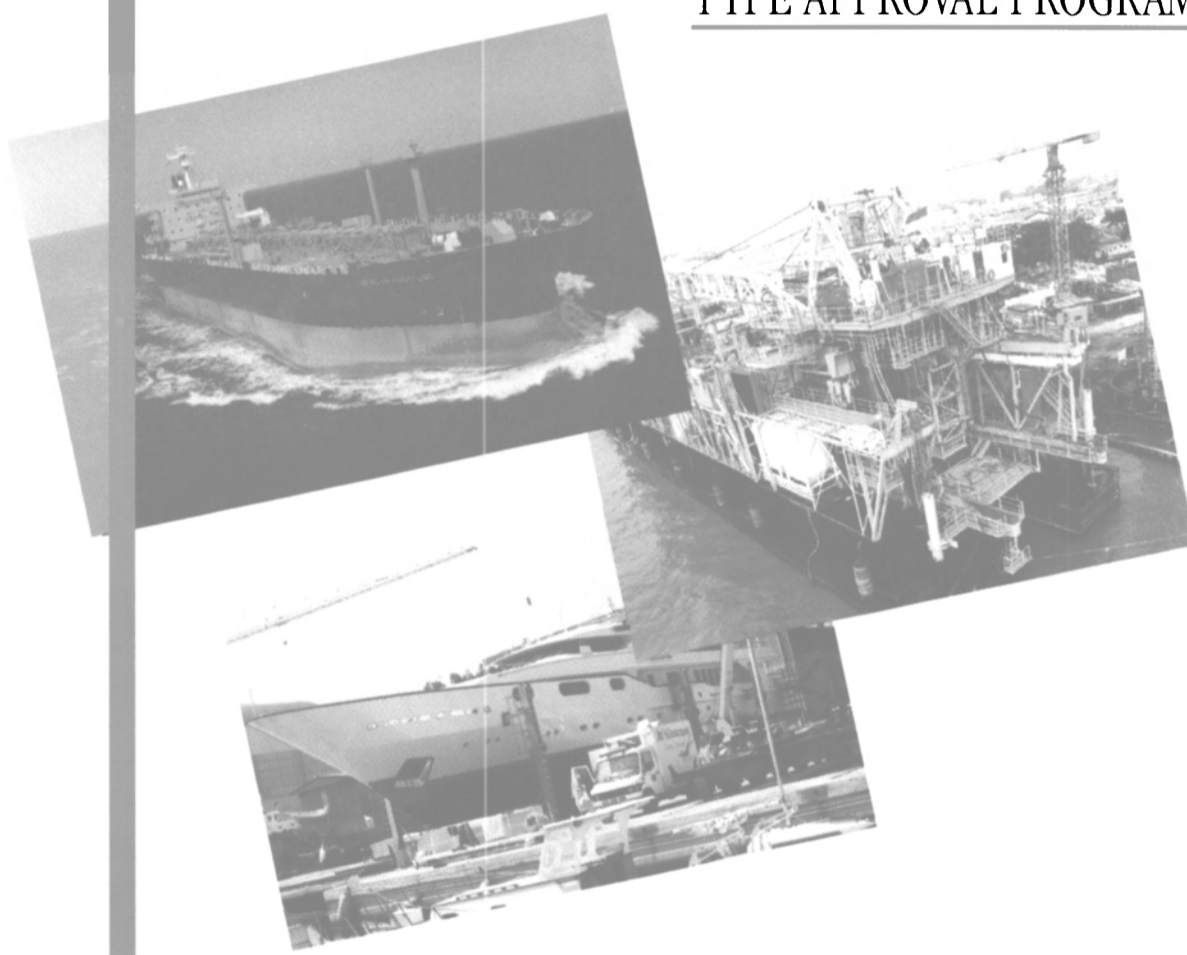
The Spanish national pavilion will be the biggest in SMM 2000 and cover an area in excess of 1,000 sq. m. In these confines will be 27 equipment manufacturing companies, four of them engine manufacturers, plus three engineering companies and five service specialists, which, together with 12 shipyards, will give a fine sample of the very best that Spain has to offer in this sector.

Spain's representation will also include five associations, two national and three regional, to give, between them, a good idea of the whole sector.

SMM 2000 is scheduled from September 26-30 in Hamburg, a fitting host as one of the world's foremost shipping cities. Last year Spain's shipbuilding industry had a turnover in excess of \$1.4 billion, of which 85 percent was for export; these activities generate more than 40,000 jobs in Spain. The Spanish shipbuilding sector boasts 51 shipyards and can tackle complex projects like FPSOs and shuttle tankers built to operate in the North Sea or dual drilling units for the Gulf of Mexico.



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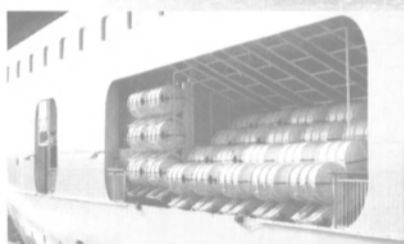
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Workboats



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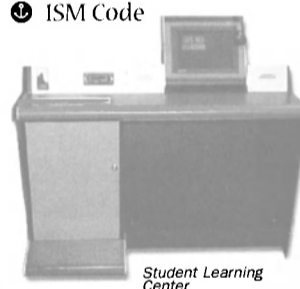
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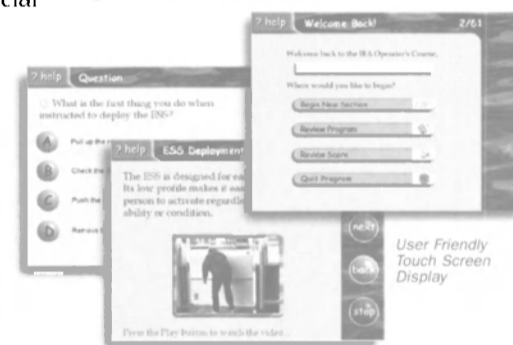
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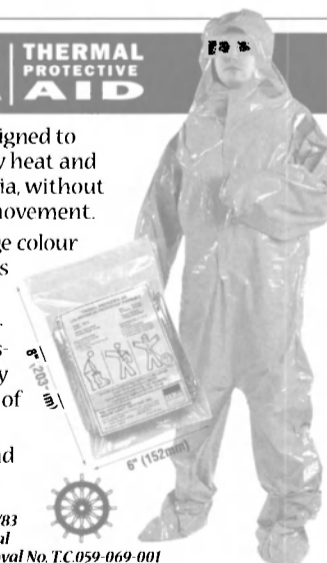
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Contracts

Abu Dhabi Awards Construction Contract

Abu Dhabi Shipbuilding (ADSB), has granted a major construction contract worth \$12.2 million to a joint venture of Arabtec and Overseas AST Co. The contract is the first of two major construc-

tion contracts planned in ADSB's ongoing facility expansion. This past August, the company signed a separate contract with Synchronlift for a new shiplift system, which is currently being manufactured.

This contract with Arabtec and Overseas AST includes the construction of

shiplift piers, dry berths, a new quay wall, two large assembly halls and the basic site infrastructure. The shiplift, dry berths and assembly halls will all be connected by a modern, land-level ship transfer system, which will significantly increase ADSB's vessel lifting and launching capability from its current

500 tons to 2,000 tons.

Metropolitan Stevedore Lands Cruise Contract

Metropolitan Stevedore has been awarded the stevedoring services contract for Commodore Cruise Line's new day cruises sailing between San Diego and Rosarito Beach, Mexico.

S/S Enchanted Sun will call at San Diego's passenger terminal, operating nine calls per week with one daily round-trip voyage Sunday through Thursday.

Metropolitan Stevedore Co. also runs the Los Angeles Cruise Ship Terminal and the San Francisco Cruise Terminal-Pier 35, providing both terminal and stevedore services.

Norshipco Granted \$9 Million-Plus Contract

The U.S. Navy awarded the work package on its USS Whidbey Island to Norshipco, a member of the U.S. Marine Repair shipyard family. The contract, which calls for topside phased maintenance, fixed-price availability, states for work to commence on May 24 for a September 1 completion.

The work package includes topside repairs, electrical and mechanical repairs, and ship alterations. Specific mechanical repairs entail main propulsion diesel engines, and ship alterations include the RAM Mk31 Mod and Ship's Self Defense System installations.

Circle 57 on Reader Service Card

NASSCO Lands \$22 Million Conversion Contract

National Steel and Shipbuilding Company (NASSCO), was awarded a contract valued up to \$22 million to finish off the second phase of a program to convert a U.S. Navy Strategic Sealift Program vessel to comply with the enhanced readiness capabilities of the U.S. Marine Corps' Maritime Prepositioning Force. Preceding by this was the project first phase, which called for the development, design, material specifications and planning for Phase II — the actual conversion work — which will commence immediately.

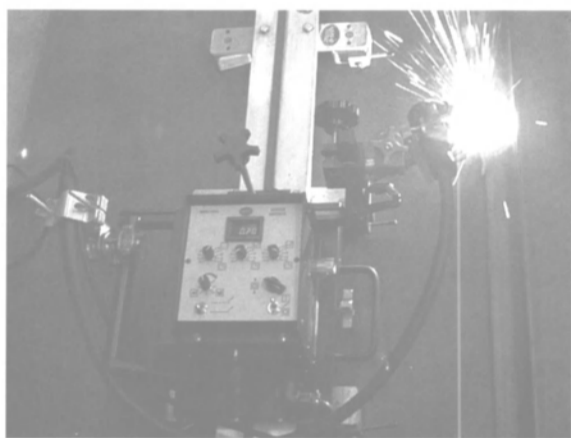
Circle 58 on Reader Service Card

Vericor To Supply Two Gas Turbines

Vericor Power Systems is scheduled to supply Aker Finnyards Oy, Rauma, Finland, with two TF40 marine aeroderivative gas turbines. The equipment will be utilized to power the Finnish Navy's new prototype T2000 Air Cushion Vehi-

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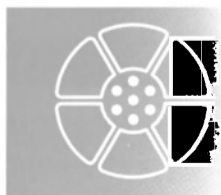
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Contracts

cle. This multi-purpose T2000 hovercraft will measure 90 ft. (27.4 m), with a total weight of eight tons. Maximum speed is expected to be 50 knots. Designed to operate year-round, the vessel will not be hindered by difficult coastal conditions. In addition, stealth properties will be maximized, with inclined surfaces that will give a small radar cross section.

Circle 5 on Reader Service Card

Hyundai Wins Container Terminal Order

South Korea's Hyundai Engineering & Construction has won a \$510 million order to build a container terminal in Hong Kong. Hyundai was reportedly awarded the deal by a group of Hong Kong companies; including Modern Terminals Ltd. Work is to begin May 12 for completion by October 2004.

South African Navy Taps GE

GE Marine Engines will install its LM2500 aeroderivative gas turbines in a combined diesel and gas turbine-waterjet and refined propellers (CODAG-WARP) configuration on four of the South African Navy's innovative MEKO® A-200 corvettes.

Each Blohm + Voss-constructed A-200 will utilize one LM2500 directly connected with a gearbox to a 20-megawatt waterjet. Propulsion will be provided by two interconnected shafts powered by diesel engines propelling two independent propellers.

The first gas turbine is scheduled for a 2001 installation, with commissioning of the first vessel slated for 2004.

GE Marine Engines is set to supply Motoren- und Turbinen-Union (MTU), Friedrichshafen, Germany with a pair of GE LM2500+ aeroderivative gas turbines. The units will be utilized to power the Corsaire 14000-class monohull fast ferry being constructed for Maritime Company of Lesvos (NEL), Piraeus, Greece.

France-based Alstom Leroux Naval Shipyard is building this innovative new vessel class of fast ferry for NEL. The yard also constructed the Corsaire 13000, which is scheduled to enter service this June for Societe Nationale Maritime Corse Mediterranee (SNCM).

LM2500+ gas turbines will be used in a Combined Diesel And Gas turbine (CODAG) configuration with two diesel engines. With a total propulsion of 66 megawatts, the 460 ft. (140 m) fast ferry will be designed to transport 1,800 passengers with a cruising speed of 42 knots on its route from Piraeus to the island of Lesvos.

Circle 88 on Reader Service Card

Jumbo Dredgers Will Be Wärtsilä Powered

An order for a 23,700 cu. m trailing suction hopper dredger contracted in December 1999 by Ham Dredging at IHC Holland, which is due for delivery in Autumn 2001, will be powered by a pair of Wärtsilä 12V46C main engines

of 25,200 kW, in conjunction with a 1,860 kW Wärtsilä 6L26 auxiliary engine. The dredger will measure 556 ft. (169.5 m), with a Panamax beam of (32 m), a draft of 12 m and deadweight of 36,450 tons.

Similar machinery will also be implemented in the 21,500 cu. m dredger, Rotterdam, which was ordered last year

by Ballast Nedam for a 2001 delivery.

Twin Wärtsilä 12V46 main engines, as well as a 6L26 auxiliary were also installed on each of two 23,400 cu m dredgers — the WD Fairway and Queen of the Netherlands — built in 1997 and 1998, respectively for Royal Boskalis Westminster.

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Contracts

Swift Ships Completes Candy Fleet

Two pairs of Hamilton HM651 jets with 25-in. impellers are being installed on two 170 x 30 ft. (51.8 x 9.1 m) hulls being built for the Candy fleet at Swift Ships Morgan City shipyard.

Powered by 12-cylinder Cummins KTA38-M2 engines rated for jet application at 1,350-hp at 1,900-rpm, the jets were introduced at last year's Workboat Show in December.

Auxiliary power will be provided by two Cummins 6B5. 9GM-powered 50 Kw gensets. Cargo capacity on the ves-

sel's 105 x 24 ft. (32 x 7.3 m) aft deck will be 200 long tons.

Circle 89 on Reader Service Card

Wärtsilä Orders Surge

A dramatic increase in orders was experienced by Wärtsilä NSD Corp. for marine diesel engines in China during

the first part of this year totaling more than \$36.5 million. Just this past March, the company received orders for a total of 115,000 kW of four-stroke engines and 33,200 kW of two-stroke engines.

Specific projects filled by the company included main and auxiliary engines for the second RoPax vessel for Rederi AB Gotland, Sweden, at Guangzhou International Shipyard. This vessel will be equipped with four Wärtsilä 12V46C main engines, each of 12,600 kW at 500-rpm, and three Wärtsilä 9L20C auxiliaries, of 1,530 kW each at 900 rev/min.

The company is also supplying the auxiliary engines on five VLCCs contracted at Dalian New Shipyard for National Iranian Tanker CO. Wärtsilä will provide 15 of its 9L20 type engines.

Circle 62 on Reader Service Card

Stratos Wins Offshore Nova Scotia Contract

Stratos has been awarded a contract to supply C-band satellite equipment and teleport services for PanCanadian Petroleum Limited's exploration drilling program offshore Nova Scotia. Stratos will be responsible for communication and monitoring access to its offshore platforms through the Nova Scotia Teleport.

In collaboration with Maritime Telegraph & Telephone (MTT), Stratos is implementing a purpose-built C-Band Teleport in Halifax that will provide high quality satellite earthstation access for the booming offshore oil & gas exploration and production industry.

MacGregor Wins Redesign Contract

Under the first phase of a conversion project being undertaken by NASSCO, the shipyard has called upon MacGregor to redesign USNS Snodeman's 138 ft. (42 m) long slewing ramp to comply with new requirements.

The revision will allow the RoRo ramp to be deployed and used for vehicle access from a quay or floating dock platform, as well as amphibious mode.

The 11 vessels that have entered NASSCO's Strategic Sealift Ship Program so far will be joined by an addition five, with three more next year, rounded out by the final ship in 2002.

Each MacGregor shipset holds two single-pedestal twin cranes - the largest pedestal-mounted rotating marine cranes ever installed - a stern slewing ramp, sideport ramp systems port and starboard, and various cargo handling vehicles.

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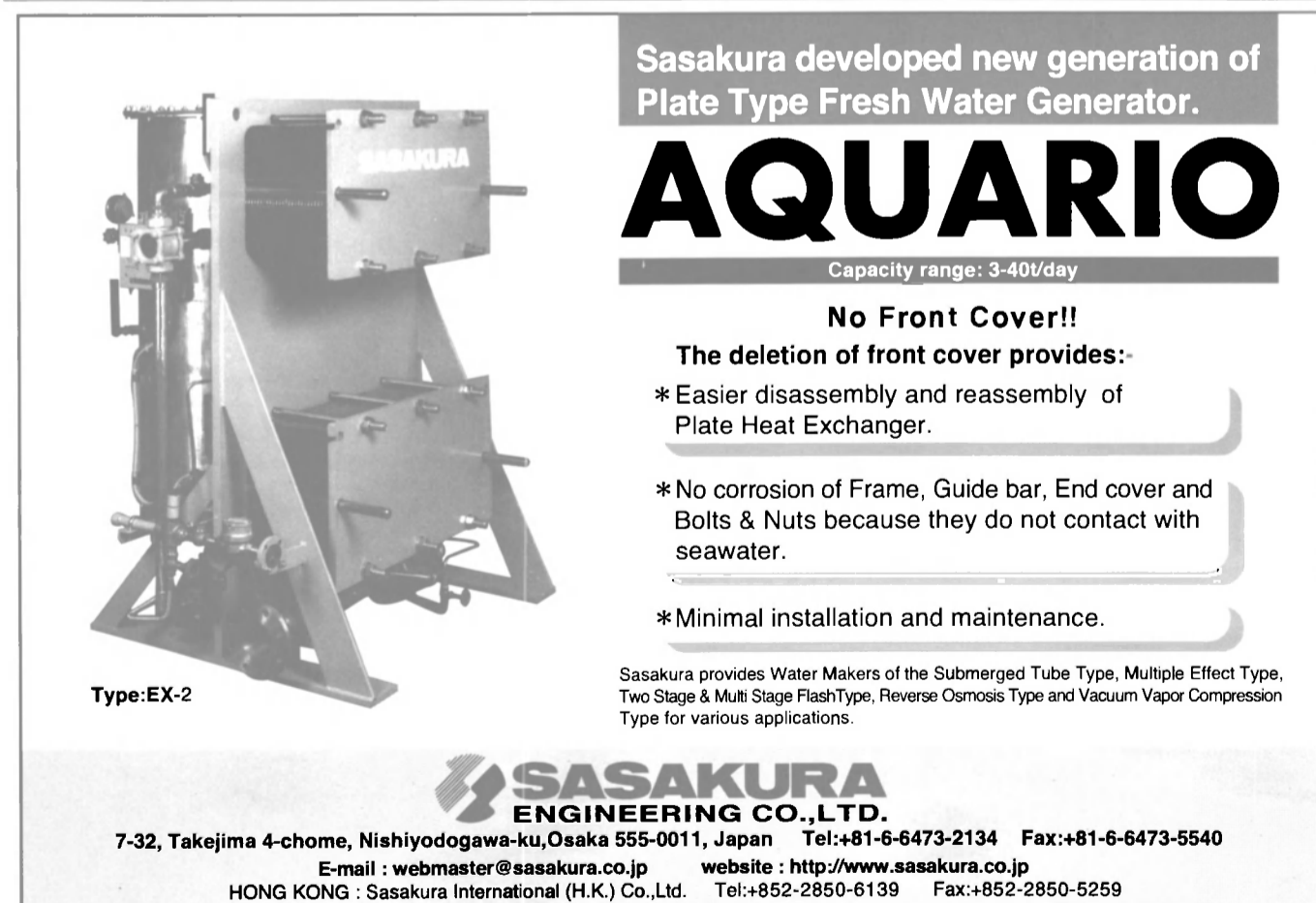
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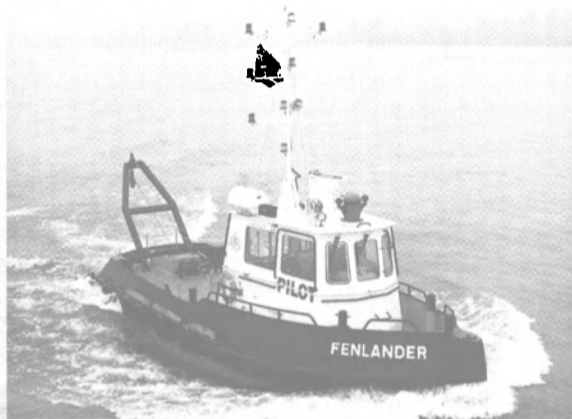
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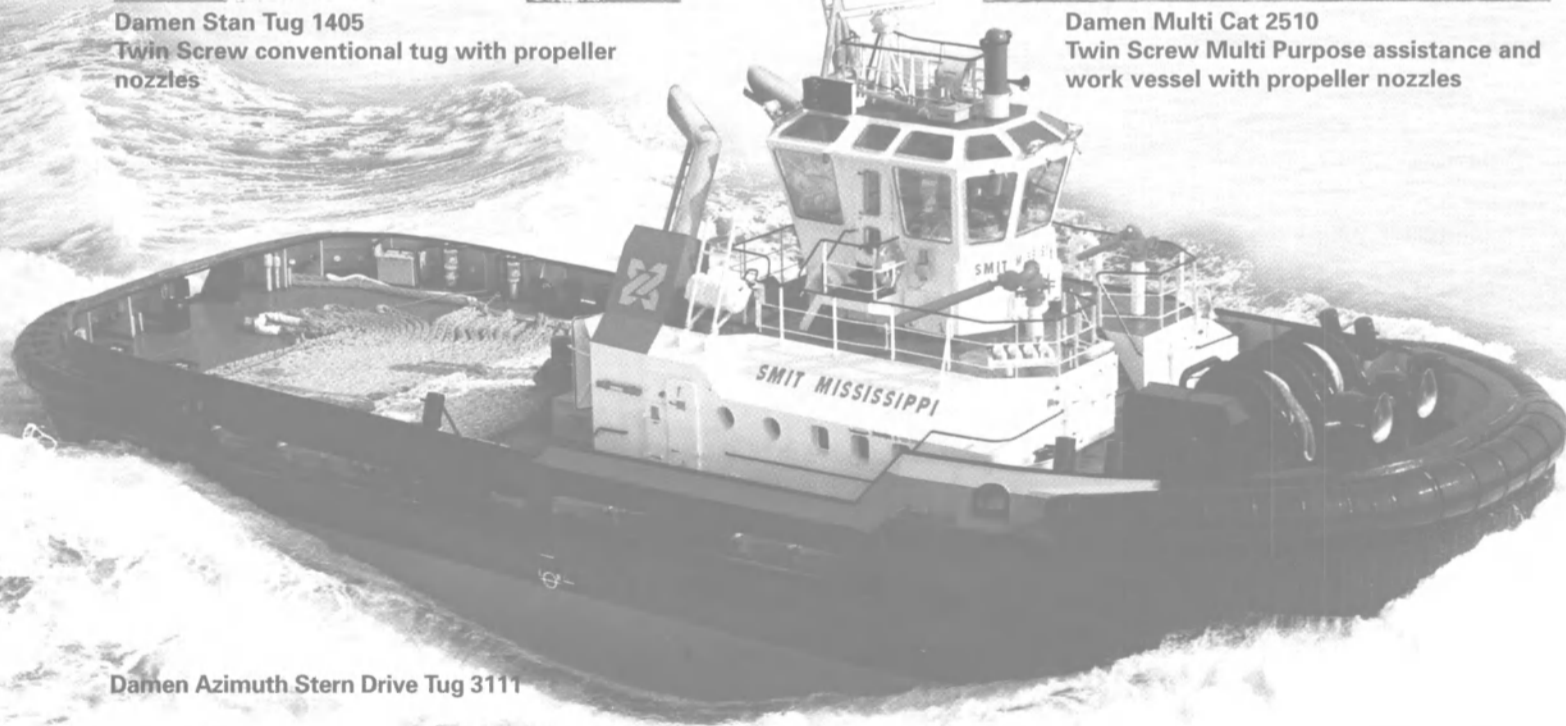
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Midland Enterprises Expands With The Times

Since planting its roots in 1925 as a small coal delivery business known as the Ohio River Company (ORCO), Midland Enterprises has evolved from one chartered boat and four barges to more than 85 boats and 2,400 barges moving the entire eastern inland waterways system. Established by **Albert Converse Ingersoll**, the Ohio River Company's

main focus at that time was to float West Virginia coal to Cincinnati using its premiere boat — the E.D. Kenna. Built for its newest customer, Cincinnati Gas & Electric (the company's longest running business relationship), the vessel cost \$179,325 in 1926. Subsequent to this successful venture, the company's demand continued to grow, causing a

need for added capital. Ingersoll called upon **C.E. Hutchinson**, president of the West Virginia Coal and Coke Company to discuss a possible venture. Talks between Ingersoll and Hutchinson proved favorable, as ORCO was incorporated as a subsidiary of the coal-mining company on April 17, 1925. Operating under the partnership of Ingersoll and W.W.



TOP: Captain **Edgar "Jocko" Meeks** uses a telegraph to communicate with the engine room. Pilot house control and radar navigation was not established until the 1940s.
BELOW: A contemporary pilot house outfitted with advanced radar systems, computers, phones and other innovative equipment.



Marting, the company's contract with CG&E spawns the construction of another facility in 1931 — the Mill Street terminal in Cincinnati. Located next to the utility's company plant at Front and Rose Sts., the new building is able to unload coal barges into either railroad trucks or cars.

In 1937, Ingersoll formed an Illinois division of the company to move coal from Havana, Ill. to Commonwealth Edison's steam plants in Chicago. Headed for a short time by Ingersoll's son A.C., the division eventually fell under the direction of **John C. Marting** (son of W.W.) whose tenure with company spanned 35 years.

An era ceased in 1938 when both Ingersolls left the company to establish Central Barge Company in Chicago, which would eventually evolve to become part of the Valley Line. **W.W. Marting**, Ingersoll's original partner takes over the company that he worked to establish — as general manager — position he would hold until his death in 1945. The 1950s brought about myriad of change for ORCO, beginning in 1954, when the company was taken over by a group of New York businessmen headed by **Simon H. Scheuer**, instilling a change in leadership and direction. Scheuer, along with attorney **Eli Goldston**, the company's new vice president, collaborated in the selling of coalmines to focus on barging. One year later, West

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Virginia Coal and Coke's name is changed to Midland Enterprises; the towing end of the business continues as The Ohio River Company.

At this time, not only was it the end of the former West Virginia Coal and Coke, but it was also the end of an era with the traditional steamboats being replaced more modern, streamlined vessels powered by diesel engines. Difficult changes to get accustomed to, many steamboat captains were not shy about expressing

their dissatisfaction with this new development. "They're [the new vessels] noisy and they stink," one captain quips. "Besides, they don't have a decent whistle, only a bleating horn."

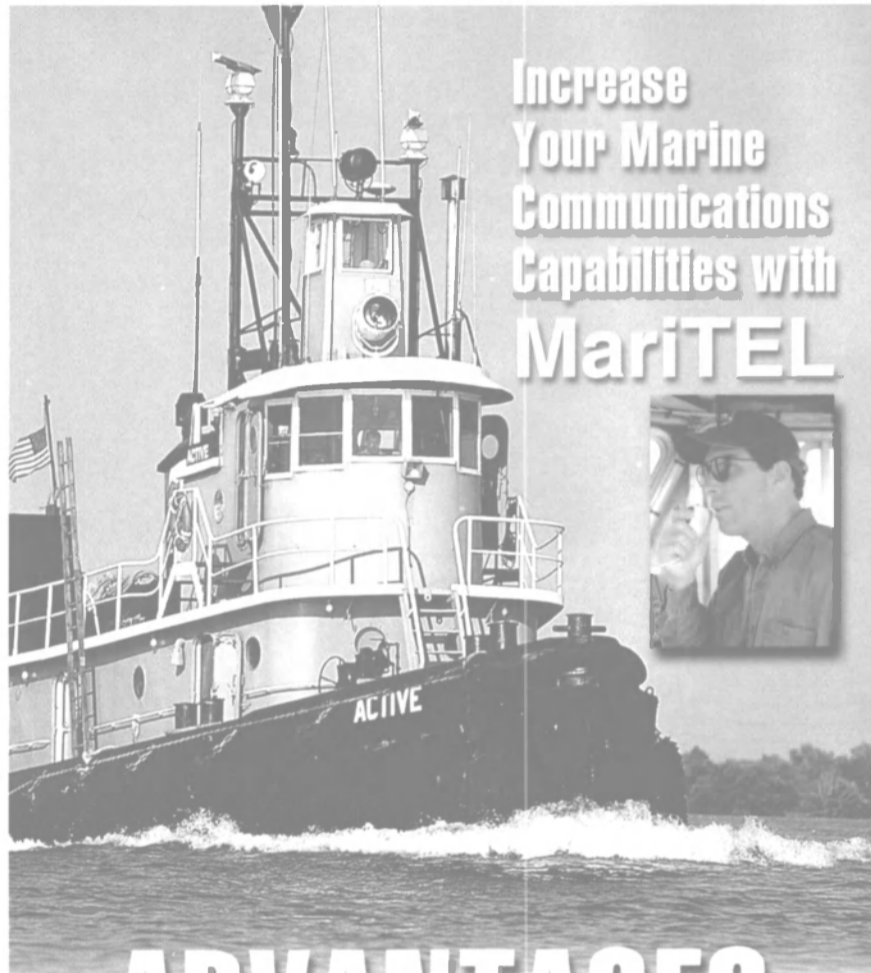
In 1961, the company is very appealing to Eastern Gas and Fuel Associates of Boston, who purchase ORCO and its parent company. At the time, the company estimated as holding revenues of \$24 million and handling 15 million tons a year, is employing 900 people. That

same year, the new company deploys the John Ladd Dean, which in 1962 set record for tow size by picking up 43 standard and two jumbo barges.

Expansion best describes the focus of the company throughout the 1960s and 1970s with the formation of the Orgulf and Red Circle divisions, as well as the signing of a 15-year contract with Freeport Sulphur Company in 1967 for the transportation of 2.25 million tons of wet phosphate rock from Tampa to

Uncle Sam, La. In 1969, it was noted that the complete Midland conglomeration of companies was moving more than 25 million tons of cargo annually. Known as the largest tonnage carrier on the inland waterways, the company operated 30 towboats and more than 1,000 barges at that time.

Shortly before the company is taken over by "the modern era," John D. Geary is elected president of the company in 1974. Geary spearheaded a sig-



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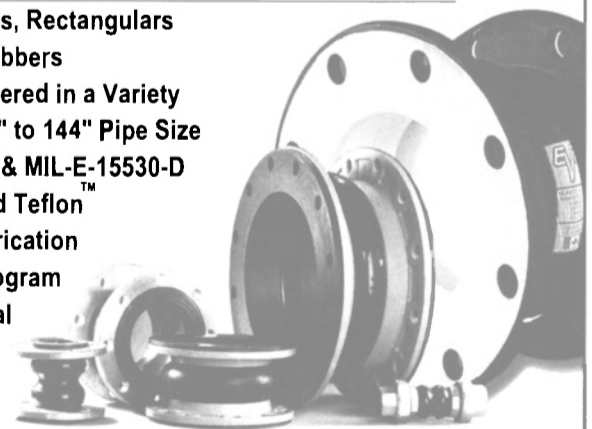
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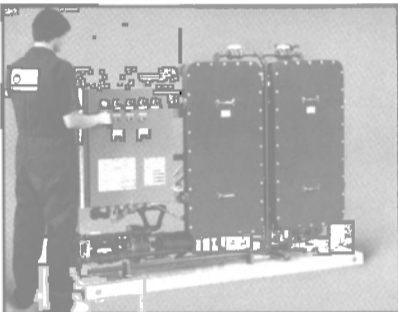
nificant fleet expansion, the commencing of barge building at Port Allen Marine and renovations at Huntington Terminal. He also furthers the importance of long-term contracts, which will prove to be instrumental for the company's success. In 1982, Midland further expands its base with the acquisition of two companies in Paducah, Ky. — Walker Boat Yard and R&W Marine. The company also attains Federal Barge Lines two years later — a move that

would expand its presence in the transportation of grain and grain products. Midland also changes with the times in the mid-80s by joining the technology revolution by installing a system called TowLine, a computerized tracking system that gives customers the most revised information about each barge load. In addition, onboard computers become a standard fixture on all operating equipment in 1993. Following the end of Geary's tenure in 1988, **John W.**

Hancock for whom the company's training center is named, now heads the company. Established in 1990 on a deck barge at Walker Boat Yard, this floating classroom provides facilities for deck-hand orientation and other types of training. In cooperation with Seaman's Church Institute, the first group of Midland captains completed Midland's training program in 1997. Presently, the company has moved to partner with customers and signs agreements to provide

complete U.S. water transportation logistics for Trico Steel, as well as managing dock operations for Lafarge Gypsum. According to **Mark Cook**, Midland's current president, the company will continue to prosper for another 75 years because of its strong ties to its customers and reputation for service. The announcement by Midland's parent company that it will merge with KeySpan Energy of Brooklyn, N.Y., best echoes Cook's sentiments.

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Maritime Reporter/Engineering News

New & Notable

Flender Werft Delivers Second Of RoRo Series



Flender Werft delivered the second of a three-part RoRo series to owners Wagenborg Scheepvaart on April 28. Named Schieborg, the 602 ft. (183.4 m) vessel will be put to service between the ports of Gothenburg and Zeebrügge for Finnish-Swedish forestry product group StoraEnso. Designed to carry heavy paper and cardboard supplies transported in the StoraEnso Cargo Units, the vessel is equipped with specially fabricated tall containers, whose measurements of 45 x 12 x 12 ft. (13.8 x 3.6 x 3.6 m) exceed the conventional 40 ft. container. The company uses approximately 900 units of these containers, which can hold up to 70 tons of paper for the combined rail and sea transportation of their products. Built according to Bureau Veritas standards, the Dutch-flagged vessel's propulsion is provided by a long-stroke cross-head Wartsila diesel engine with an output of 10,920 kW at 135-rpm.

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Main Particulars

Length	602 ft. (183.4 m)
Breadth	83 ft. (25.2 m)
Depth	50 ft. (15.3 m)
Draft	25 ft. (7.5 m)
DWT	13,000

Cisne Branco Is Built To Train

Damen Shipyards has constructed its second sailing vessel — Cisne Branco — built as a training vessel for the Brazilian Navy. Developed as a result of a sister vessel that the yard was concurrently building for the City of Amsterdam and a Dutch Job Agency, Cisne Branco is a square rigged clipper built accordingly to Lloyd's Register standards.

Main Particulars

Length	249 ft. (76 m)
Beam	34 ft. (10.5 m)
Depth	21 ft. (6.4 m)
Draft	16 ft. (4.8 m)
Displacement	1,038 tons
Main Engine	Caterpillar 3506 B
Propelle	Berg
Gensets	Caterpillar 3306B
Speed	17 knots
Gearbox	Reintjes

Hvide Marine/Sun State Christens U.S.-Built Cargo Ship

Hvide Marine Incorporated (HMI) and subsidiary Sun State Marine Services, Inc., recently christened the first in a series of new cargo ships at its U.S. shipyard facility in Green Cove Springs, Fla. Constructed entirely on-site by Sun State

Marine Services, Inc., the 190-ft. (57.9 m) landing craft-type freight vessel is specially designed and suited for conducting trade with Bahamian and Caribbean markets with minimal or unimproved facilities.



"The landing craft has a reinforced hull allowing use of unimproved landing sites such as beaches or boat ramps by actually grounding the forward part of the vessel," said **Robert J. Coppedge**, vice-president of Sun State Marine Services, Inc.

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Conrad Delivers Spud Barge

Conrad Shipyard, Inc., based in Morgan City, La., has delivered a new double rake, spud barge named Norman B for Sterling Equipment Company of East Boston, Mass. The barge is 150 x 45 x nine ft. (45.7 x 13.7 x 2.7 m), and has 2-24 in. square spud wells. The main deck is ABS approved for 2,000 pounds per sq. ft. uniformed deck loading. Conrad Shipyard's in house design and engineering expedited production. Construction time for the Norman B was eight weeks. Sterling Equipment Inc. is a major East Coast marine and heavy equipment rental company.

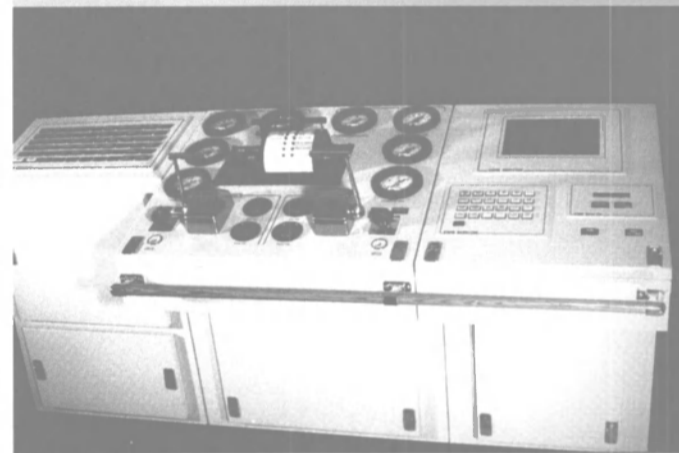
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Bollinger Delivers Two Barges

Bollinger Marine Fabricators was able to formulate the plans for two 356 x 54 x 13 ft. (108.5 x 16.4 x 3.9 m) double skin asphalt barges for American General Transportation, Mobile, Ala. Studying the influence of barge design and operations by various industry pro-

fessionals, **Normond J. McAllister, Jr.**, president of American General, came up with the AGT 3600 series asphalt cable barges, which were designed and built in conjunction with Bollinger. According to McAllister, "The 356 ft. (108.5 m) length was chosen because it can carry more cargo in each barge and its length is currently the largest barge length allowed through the remaining 360 ft. (109.7 m)

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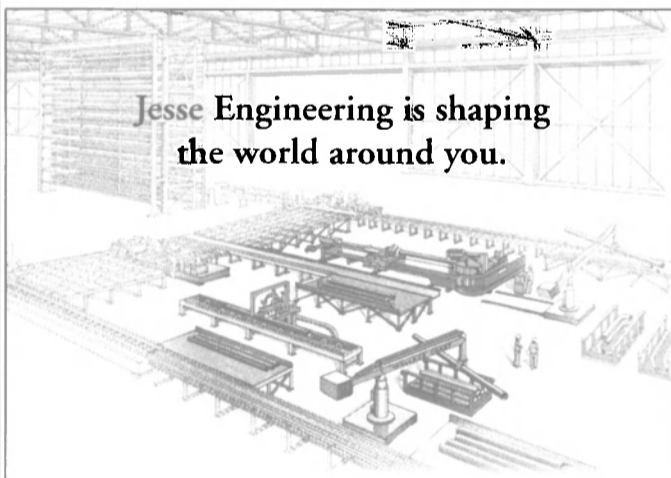
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able to leak from any tank should an accident occur.

Each cargo tank has an additional block valve for added flexibility to the system and offers an auxiliary method of securing a tank with a broken valve — thus avoiding an overflow spill

caused by a single leaking valve.

The centrifugal pump has a capacity of 7,200 barrels per hour and the positive displacement pump's capacity is 3,200 barrels per hour.

The tow has a combined discharge capacity of 20,800 barrels per hour.

These pumping rates are achieved by using one of Caterpillar's newest engines — the all electronic model 3456 engine, which is rated at 550-hp. The entire tow can discharge a cargo of 62,000 barrels in slightly over three hours.

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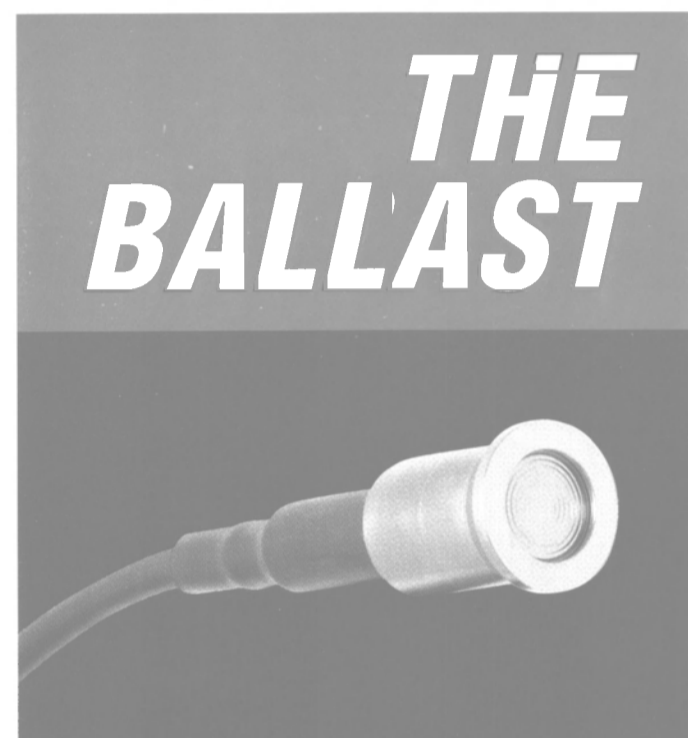
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New & Notable

WaveMaster Ahead Of Schedule With Ferry

WaveMaster International launched its innovative 164 ft. (50 m) high-speed monohull ferry — one week ahead of schedule — on April 29. The vessel is known as the largest aluminum mono-

hull ferry to be exported by an Australian shipyard to Europe.

Christened as Speedy, the ferry's construction commenced in December 1999. Following four weeks of sea trials, the vessel will be delivered to its owners in Germany.

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Cenac Towing Commissions Offshore Tug

Houma, La.-based Cenac Towing commissioned a 100 ft. (30.4 m) offshore tug with a trio of Cummins big 12-cylinder KTA38 M0. The vessel's 34 ft. (10.3 m) beam and 12 ft. (3.6 m)



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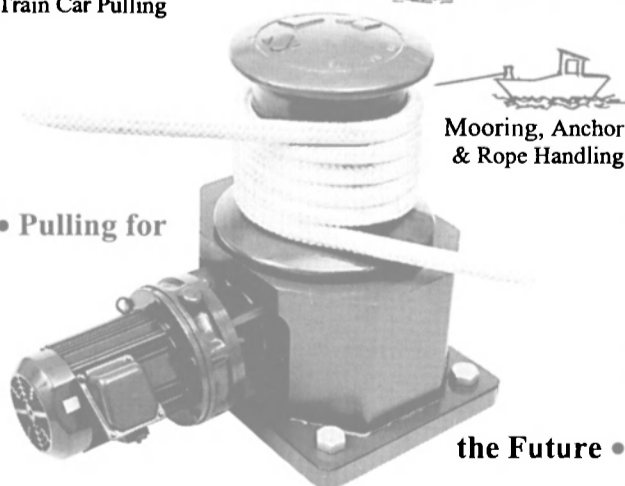
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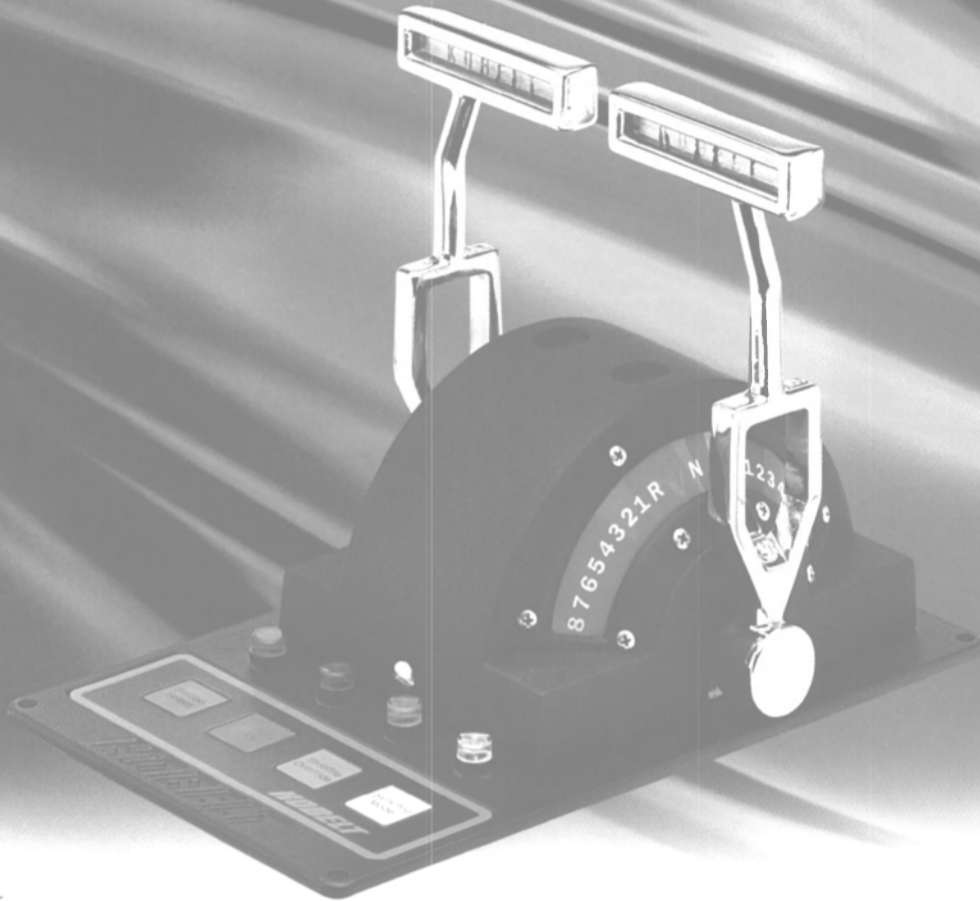
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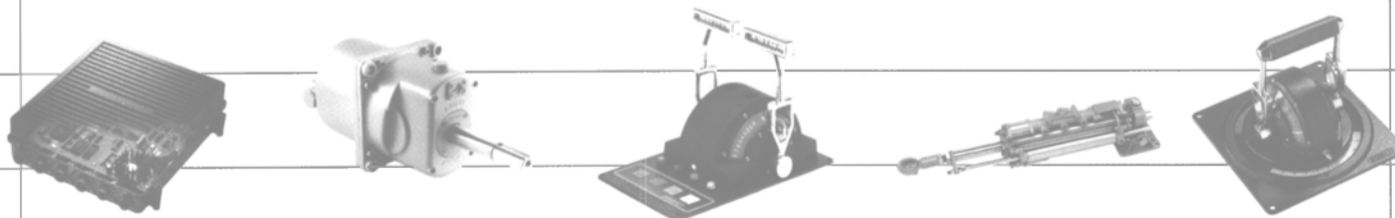


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Cenal Launches Hull

In May, Cenal Shipyard, Gdansk, Poland completed its third launching of the new millennium. Constructed to DSI rules and regulations, the launched hull measures 73 x 20 x 9 ft. (22.4 x 6.2 x 2.7

m) and is one of the 16 hulls contracted with Dutch clients. Final delivery and acceptance will occur after the vessel arrives in Holland.

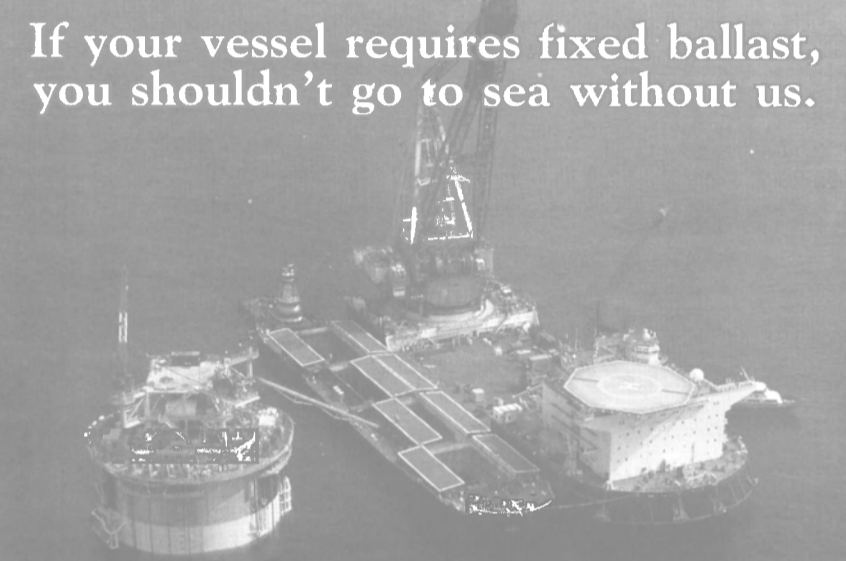
Following this, on May 12, the yard completed its hull launching of a fishing vessel, long liner, which has been built

in compliance with DNV rules, will be towed to Norway for outfitting and commissioning where it will subsequently be used by Mek. Verksted AS.

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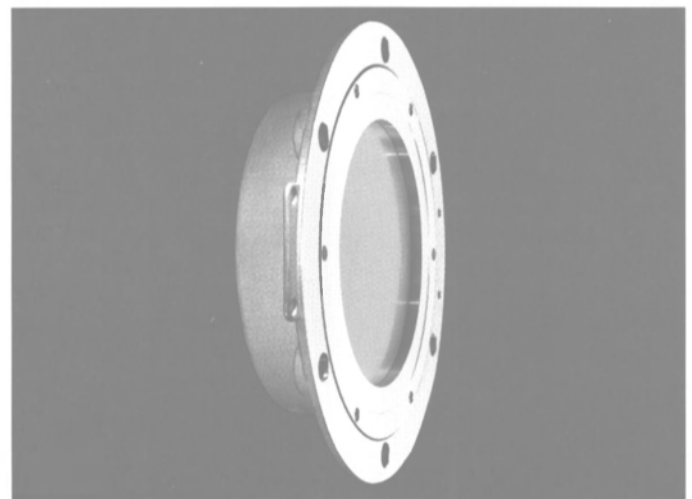
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(Continued from page 7)

Technical Challenges

While the creation of a successful design for these series of vessels for Transocean was obviously the largest and most prominent construction issue, it is clear that innovation onboard the drillships went straight through to the delivery of Discoverer Deep Seas.

Upon touring the vessel just prior to delivery, **Francisco de Bartolome Guijosa**, the engineering manager, provided

keen insight to slight, yet significant changes incorporated into the ships. For example, special anchor supports were mounted outside of the hull to support the load during the critical mooring phase. (See picture far right). Also, as previously mentioned, each of the three vessels was moved to Bazan for final fitting of the Aquamaster thrusters (see picture, bottom page). Astano engineers, with manufacturer support literally

developed their own system of installing the units based on the physical limitations of the yard. Drastic improvement regarding the installation of these valuable units, as would be expected, was seen from the beginning to the end. For example, it took four days to place the first unit on the first vessel, while installation aboard Discoverer Deep Seas was two units per day. The four massive 80,000 capacity cranes, designed for

handling of the drilling risers, BOP, removal of the thruster motors and other machinery equipment, presented their own technical challenges. Specifically, the crane pedestal was modified from the first ship to the last, with Discoverer Enterprise sporting cylindrical pedestals while Discoverer Deep Seas' cranes stability was enhanced with a new shape, illustrated on page 7.



These anchor mounts help ensure stability during critical mooring operations.

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Astano: A matter of survival

While it is obvious that Astano, along with most if not all of its European ship and offshore building colleagues, are concerned regarding the expansion of building capacity and technical expertise within the Korean shipbuilding community, it is obvious that it will fall back on traditional strengths to fend off competitor's best shots.

For example, Research and Development, activities, which had slowed considerably at Astano over the past two years as most efforts were geared toward the successful completion of the Discoverer series, are now stoked and focused on developing a new FPSO design geared for ultra deepwaters (waters from 3,000 to 10,000 ft.). According to **de Bartolome Guijosa**, the engineering manager, challenges inherent in this design will be mooring and station keeping capabilities. Meanwhile, Astano, again like all of its offshore building colleagues, are eagerly awaiting the upturn in offshore business due to the rising and sustained price per barrel of oil. According to **Luis A. Mendez**, the big areas of interest currently are offshore Africa, with a pair of contracts pending decision relatively soon. The first project is the Amenam Field in Nigeria, a project calling for a 2.4 million barrel FSO. A decision on the Elf project builder was due at press time. The second impending project is for Texaco and involves the Agbami Field, a project which will require an



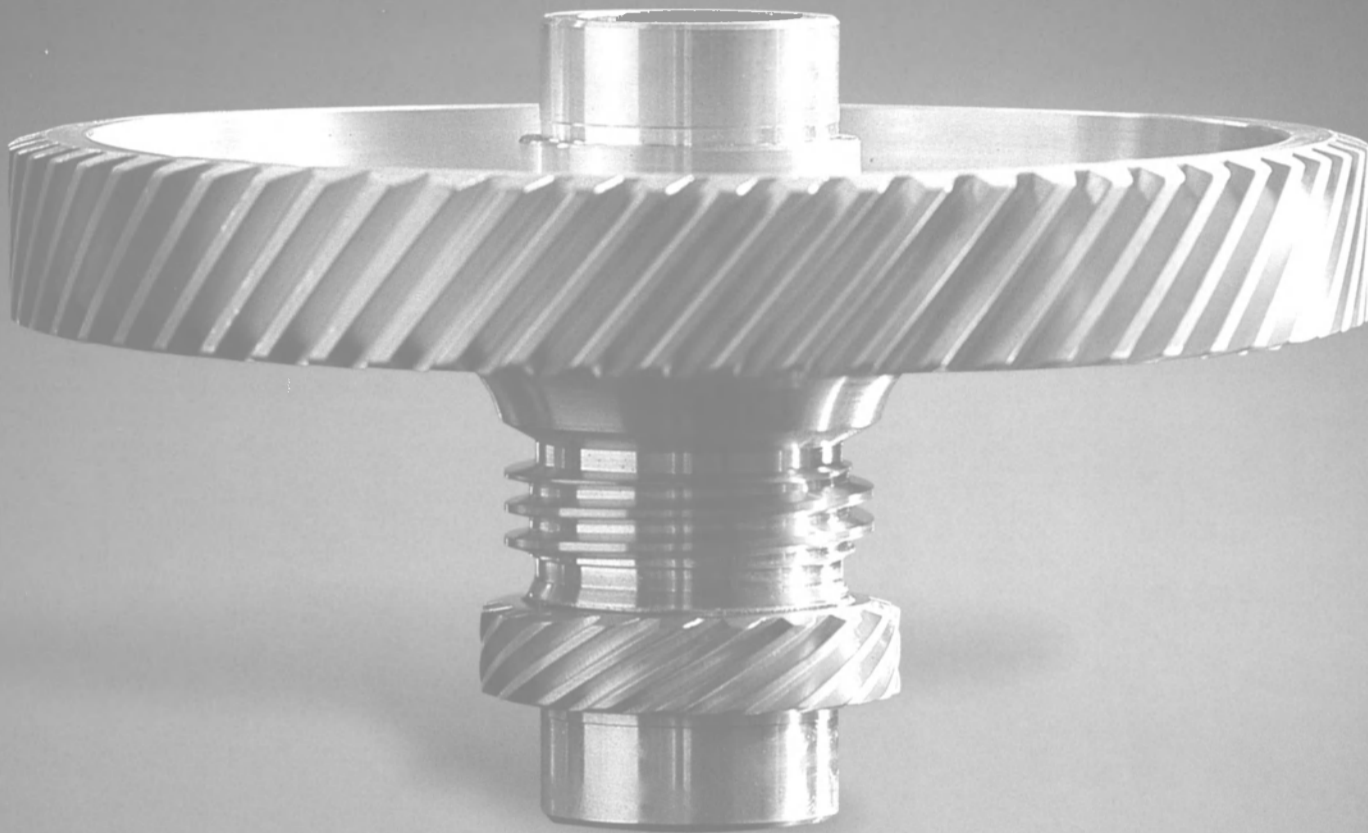
Six massive, 5,000 kW Aquamaster thrusters ensure Discoverer Deep Seas stays on station.

FPSO in the range of two million barrels with a production rate of 200,000 bpd. A decision on this vessel is due at the end of the year. While the West African projects provide the best overall offshore projects at this time, the tenuous political situation has dampened hopes and provided a string of problems for the oil companies.

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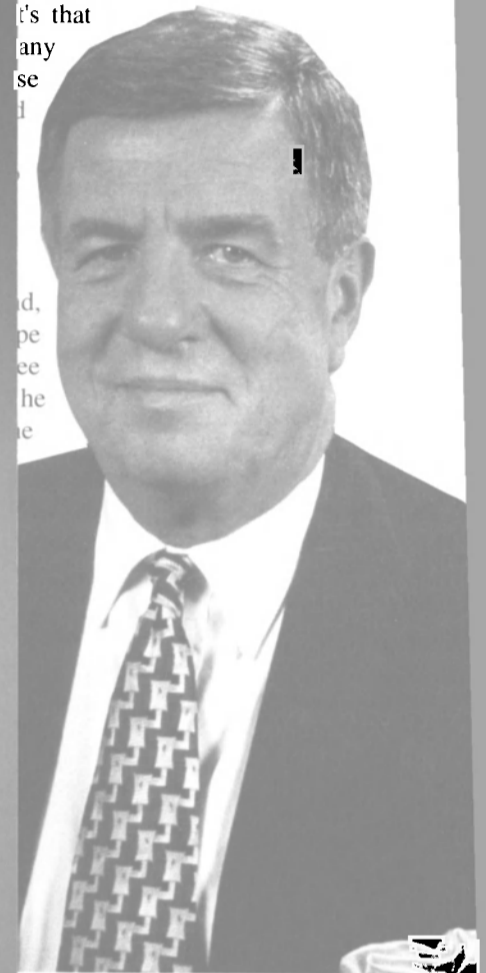
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McLeod, president & COO, AMCV.

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In this place, McLeod incorporated his years of marketing, sales and all-around managerial

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"In a nutshell that's (the job at Scott) what I did, he said. "I just wanted a decent job where somebody would hire me and pay me a decent wage."

Not desiring a career in the toilet paper business, McLeod left Scott and decided to try his hand in New York's whirlwind advertising mecca on Madison Avenue. His path finally cleared when he was

granted a spot in Young and Rubicam's (Y&R) Account Management Development Program — a program that is known for cranking out future executives — such as Y&R's current president. While at Y&R, McLeod handled consumer accounts dealing with everything from potato chips to a major airline. He remained there until 1969,

when he left New York again, this time for the heat of South Florida to join an ad agency in Miami, where he eventually landed the Royal Caribbean Cruise Line (RCCL) account. It was a favorable match for both McLeod and the client, who in 1972, asked him to join the cruise line full time as its first marketing director. McLeod had a daunting task

ahead of him, since in the 1970s cruising was known as a fledgling industry that was near death. McLeod remained at RCCL for the next 25 years, except for a two-year period when he took a break from RCCL to help Norwegian Cruise Lines with its declining balance sheet, literally taking a company that was \$6 million in debt in August 1986 to a gain of \$20 million when he returned to RCCL in October 1988 as executive vice president of sales, marketing & passengers services — a position he would hold until his resignation from the line in 1996.

Following his departure from RCCL, McLeod, who could not work for another cruise line due to a one-year non-competition agreement that he had with RCCL, was tapped by his good friend, Carnival CEO, and NBA Miami HEAT owner, **Micky Arison**, to serve as the team's senior vice president of marketing. Comparing his stint with the HEAT to a "refreshing scoop of sorbet between dinner courses," McLeod enjoyed his time with the team during its 1996-1997 season.

After the expiration of his non-competition agreement, his good friend Arison made him an offer he couldn't refuse as senior vice president of marketing for Carnival Corp. McLeod went back to the industry where he found his niche, working with Carnival's senior management groups to develop cross-marketing opportunities.

Proud To Be An American


Besides working to further U.S. Lines' strong sense of patriotism to potential customers, McLeod, who is very hands-on in dealing with customer satisfaction, still has many goals to accomplish before retiring, such as expanding U.S. Lines' excursion base to beyond Hawaii, to destinations in Alaska and the South Pacific.


Patriotically, not politically speaking, McLeod has one specific goal to meet before he reaches the last stop on the ports of call in his career. "The day that I leave, I want to be able to walk out that door knowing that **Phil (Calian)** and I created an organization that gives customers the opportunity to experience a U.S.-flagged passenger vessel calling at a U.S. port with an all-American crew," he said. "I want to customers to experience this by giving them this new option."

"This is the end of the line for me," he added. "I'll make one more stop though — for a cup of coffee on my way to the first tee."

There is more Cruise Industry coverage, including the current orderbook, continuing on page 63.


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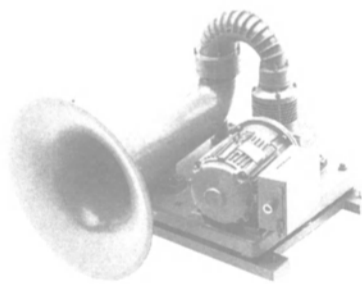
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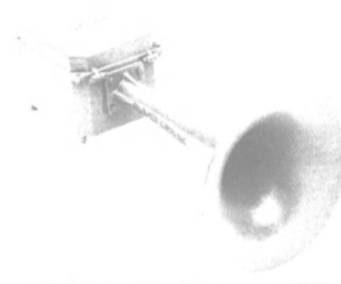
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Transforming a Transportation Company into A Successful e-Business

By **Walter "Walt" Kross**, managing director; **Caroline Calkins**, director, KPMG Consulting's Transportation Practice; **Charles Gill**, partner and national director, KPMG's Maritime Practice

The maritime industry is at an historic crossroad — and the direction that companies take can determine whether their future is filled with success or failure.

Consider this — maritime accounts for 96 percent of all transportation — driving much of the momentum of the world economy. Meeting these global needs has meant that modern maritime has embraced such advances as containerization and intermodalism. Now however, the industry is poised to accept the most dramatic change yet — digital networking and electronic commerce. While this new e-business (electronic business) model represents perhaps the greatest challenge yet faced by the industry, it also offers dramatic opportunities.

E-business presents substantial opportunities to transportation companies that have the foresight and willingness to capture the benefits by adopting new technology and modifying their business models. These benefits, however, will not come without sacrifice and substantial change. For transportation providers who do not wish — or who cannot afford — to jump on the Internet bandwagon, the development of e-business poses an enormous threat. These companies risk becoming undifferentiated, low-cost wholesalers, subordinated to transportation companies and intermediaries that own the electronic customer relationship.

Among the greatest opportunities presented by the e-commerce revolution is its astounding growth potential. The business-to-business sector (80 percent of e-commerce) is projected to reach \$1.3 trillion by 2003 (Forrester Research). While some of this is new business, representing expansion

of global trade enabled through the Internet, much of it will represent a channel shift from the way business is done today.

Not even one established carrier appears to be leapfrogging the competition — at least not yet. Most carriers have a patchwork of legacy systems and platforms, with little or no automated integration of data. Most companies have difficulty overcoming the investment hurdle and the cultural change necessary to embrace e-business fully.

How do you embark on e-enabling your company, if you are just starting out down the path?

- Demonstrate support** — Support for e-business needs to come from the top of the organization. It needs to be incorporated in the company's vision and play a role in how executives lead the company. They must demonstrate enthusiasm for the concept. Creating incentives for e-enabling the company can help drive constructive behavior throughout the organization.

- Hire professionals** - Build a team of people from in house or from the outside who bring a fresh perspective and in-depth knowledge of e-commerce. Many traditional businesses have failed to develop easy-to-use Web sites that enhance their business because they treat it as just another IT project.

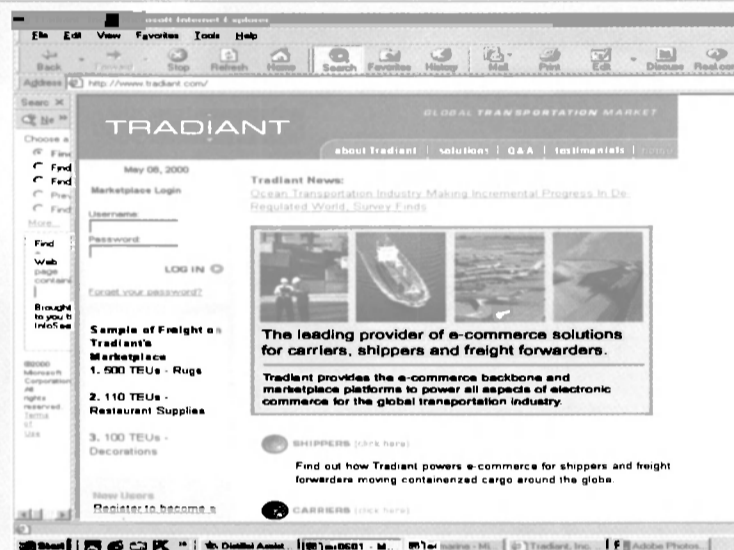
- Dedicate resources** — Building a new business is a full-time occupation. It can't be done part-time. Resources must be dedicated — and be held accountable - for the effort to succeed.

- Understand your competition** — Analyze your sources of competition. It may come from your traditional competitors, but new business models and intermediaries may pose an even greater threat. You need to identify them and understand their business models to compete against them effectively.

- Start from ground zero** — When designing your e-commerce solution, start from

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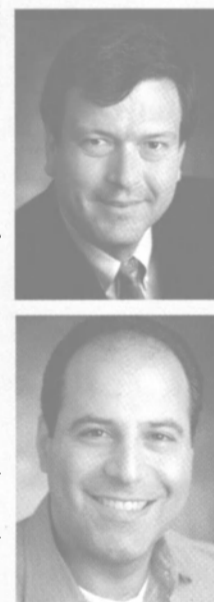


By **Greg Trauthwein**, editorial director

The creation of broad stroke, groundbreaking business deals are traditionally portrayed as being hatched on the golf course, at an exclusive social function or within the confines of a harried boardroom. The creation of Tradiant — which is a new e-commerce solution that promises to change the very foundation of the shipping business — is as unique as its lofty goals.

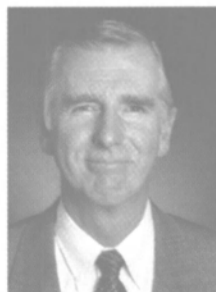
Co-founder **Aaron Sasson** and current president and CEO **John Urban** met at their daughters' PTA meeting.

While the field of e-commerce solutions serving the maritime industry is quickly becoming crowded with an equal mix of idealists and fortune seekers, Tradiant stands out with its co-mingling of technical expertise and in-depth industry knowledge. The latter is a fact not to be minimized, as the quick pace of technological access and expertise has lowered barriers of entry to a given business arena, allowing organization with scant or no real market insight as to a given industry's issues an immediate, if not long-lasting, base of business. Given the rapid pace at which electronic transactions are making all international business more efficient and cost effective, it is little wonder that the business of transporting goods from one destination to another has garnered its fair share of "solution" providers. The maritime business, in particular, is ripe for change, as many of the processes and activities surrounding activities from the selection of carriers to the filling and filing of mountains of paperwork is in many cases stuck in a laborious, manual procedure ruled more by "business the way it's always been" rather than a reality (or efficiency) check. Still, owners and operators or vessels are notorious for adhering to ways of the past, and while many claims of grandeur look good on paper (or computer screen, in this case), the true test of success will be told years from now. But if Tradiant president and CEO **John Urban** is to be



Urban (above) and Sasson hatched the idea for Tradiant at a PTA meeting.

(continued on page 40)



Walter "Walt" Kross

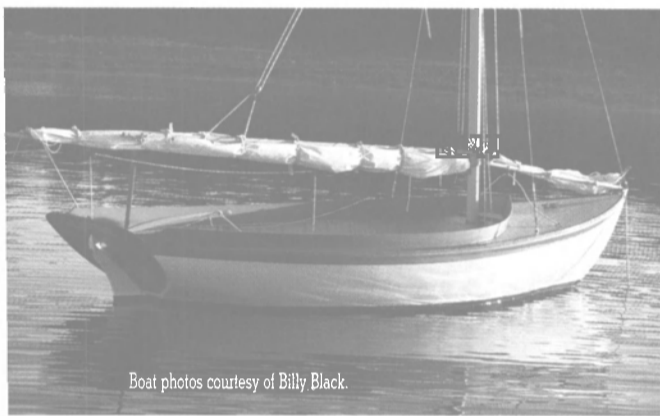


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the perspective of an Internet startup, lacking the assets and infrastructure that you have. How would you conduct business differently without your asset base? Then consider how you can leverage this model to enhance your business.

• **Build a road map** — Careful planning with aggressive milestones and regular

monitoring of progress will help ensure a timely rollout. The plan should not stop with the first development of the Web site. It should continue on to a long-term vision of what value the site can provide to customers and to your company.

• **Prioritize** — The possibilities

are nearly limitless for the functionality and services you can offer. Start with those that your customers need and desire most and that can be put in place most quickly and cost effectively. Expand from there based on the value provided to customers, cost, and speed of implementation.

• **Develop partnerships** with your customers — customers can be your greatest sales tools if they believe in the product. Enlist their comments and get them involved through on-line chat sessions, beta sites, or up-front interviews to determine the design.

Why haven't more maritime businesses advanced beyond the basic level-passive, vendor-on-demand information made available on the Internet? In a study covering more than 250 e-business efforts, KPMG Consulting and Cisco Systems Inc. have identified some basic issues that cut across industry type as well as organizational size. They included the following:

- Companies lacked a strategy.
- Companies neglected to establish a comprehensive rollout schedule with benchmarks.
- Market pressures have pushed e-business initiatives to the side.

So before a company can successfully implement an e-business plan, it must first ask a key question — what is the business itself about?

Answering that means more than just examining the company's market. It involves exploring the business' current position, where it will be in the future and how it plans to get there, and how it relates to customers. It also means ensuring that top management, including the CEO, COO, and CFO, supports a review of the corporation's culture, with a willingness to make it over to a more customer-responsive model. While the actual transformation process will be unique — reflecting the individual circumstances of each enterprise — there are sets of services and solutions that ease the process of end-to-end e-business transformations.

A successful approach leverages strategy, architecture and integration services to enable new ways of doing business with a company's core constituencies: customers, suppliers and employees. Under this model, clients achieve their e-business vision and goals by developing a strategy that addresses key business elements and constituencies. Each business element is evaluated for impact and contribution to the overall strategy, and is mapped to key strategic goals including: customer and partner intimacy, revenue growth and cost reduction, new products, services and markets. This vision-creating step lays the basic foundation for an e-enterprise.

The next stage consists of setting up Internet-powered architecture. This involves installing foundation technology, acquiring the requisite systems and enabling technologies, and merging them all together in networked applications. The goal in this stage is to create an integrated, self-running "engine" that

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is transparent to clients. In our experience, this process is often accomplished more easily when it is implemented as a series of smaller e-projects.

This offers dual benefits: it gives employees at all levels more time to become familiar with the e-process, and it also enables internal and external financial professionals to more easily measure the capital expenditures and ROI (return on investment) associated with the implementation of an e-business program.

This matrix, however, is not limited to hardware and software development. A Web-centric corporate culture is also vital to the success of an e-business. Top management, which bought in to the process at its first stage, should also foster understanding and acceptance of the e-business model throughout the company. Transportation companies, which ignore the trends toward e-business, risk becoming commodity wholesalers to new Internet intermediaries that can analyze tradeoffs among various carriers' services and prices, providing the optimum shipping solution to shippers on a shipment-by-shipment basis through a single site.

These intermediaries have begun to pop up in all industry sectors, but are particularly dangerous in industries like transportation, where there is a tendency for customers to view products and services as commodities. These intermediaries have developed new and powerful business models that can provide shippers with a comparison of delivery times, costs and carriers. While many of these sites currently cater to consumers making on-line purchases, the logical extension of this trend is business-to-business trade, and entrants are emerging in this space as well.

The Internet has also been instrumental in developing more complete backhaul networks. While much transportation business today is contractual, buying groups could form on the Internet, to consolidate volume and drive prices down for the users. Over time, they could command enough volume to damage carriers that are unwilling to play by the new rules. The best defense is maintaining a value-added relationship directly with your customers.

The Internet allows companies to extract valuable information about customer behavior and characteristics from one centralized source. Through it, companies can track each page of their customers' visits, how long they spend at each site, how they navigate around the site, what orders they cancel, and what orders they eventually book.

Companies can then use this data to identify attractive customers and markets, tailor new, higher-margin products, and reduce the costs of service and sales. With this technology, transportation companies can understand and respond

to their customers' behavior at a level never before possible. An e-business transformation is a never-ending process. It is a continuous evolution where the customer is the key. A well-organized e-business is one that asks what its customers want — gives it to them — and then continues to ask what they want.

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Fort Lauderdale, Fla.; **Caroline Calkins** is a director in KPMG Consulting's Transportation Practice in Chicago, Ill.; and **Charles W. Gill** is a partner and the national director of KPMG's Maritime Practice in New York City.

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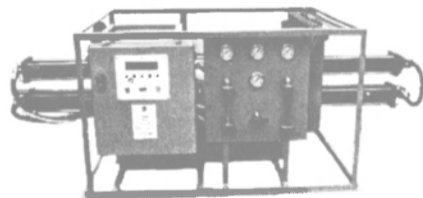
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(Continued from page 36)



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believed, his company will be one of the majors left standing, as he explains Tradiant's system will take a 2.5 week process and whittle it down to an afternoon's work.

Tradiant, unlike similar competitors in the market, has created a system which is touted as an innovative e-commerce platform for shippers, carriers and freight forwarders designed to power all aspects of e-commerce for companies involved in the estimated \$1 trillion market for transportation services worldwide. The company's e-commerce platform is known as Tradiant Trans-Commerce, and is designed as an e-commerce backbone to streamline disparate back-office functions, offering a robust set of public and private, business-to-business marketplaces to move freight across all modes of transportation. At the time of the company's meeting with *Maritime Reporter*, it had already contracted with 24 carriers for participation.

In a meeting with president and CEO Urban, he is quick to point out that Tradiant is not, by any definition, an auction site. "Auction models are devastating to a carrier," he said.

Urban, it should be noted, is intimately in tune with the needs of carriers, with more than two decades of experience in the global transportation industry, including extensive experience in Latin America and Asia. For 15 years he worked for American President Lines, now part of NOL. While with APL, he built the company's Latin America group into a \$150 million per year business. "At APL, we had 153 sales representatives, but only strong identifiable relationships with about 6,000 customers," said Urban, which is less than 10 percent of the 70,000 small and medium size importers and exporters that are available for business. Tradiant, he contends, will give shippers a much wider and much more cost-effective access to their customers.

Deep Pockets

While competitors — both directly and indirectly — in its business arena are inevitable given the ease of access with today's technological solutions, Tradiant brings to the table a feature not readily available to most — the backing of world-class and extensive financing. Tradiant's investor group is led by Warburg, Pincus Venture Partners, a leading private equity firm. The investor network also includes Silicon Valley stalwarts **Aaron and Ori Sasson**, founders of the successful Scopus Technology, a company that was acquired by Siebel Systems for \$480 million in 1998. While strong financial backing is imperative to long-term success, the Sasson brothers bring with them cash and a proven technical expertise to help ensure Tradiant's solution is technically compatible with industry needs. **Aaron Omid Sasson**, chairman of the board, has more than 20 years of experience as a technology leader and has helped found four companies, including Tradiant. Before starting Tradiant, Sasson was co-founder of Scopus Technology and served as senior vice president of Field Operations. At Scopus, Sasson played a key role in its successful initial public offering and in driving revenues to more than \$100 million in six years. He also led the company's successful merger with Seibel Systems, an industry leader in enterprise relationship software. Sasson was also a founder of Plato Software, which was later acquired by Genesys Labs. He has held executive-level and management positions at Opus Systems, Sun Microsystems, GenRad, and Motorola. He earned a Bachelor of Science degree in Electronics Engineering from the University of London.

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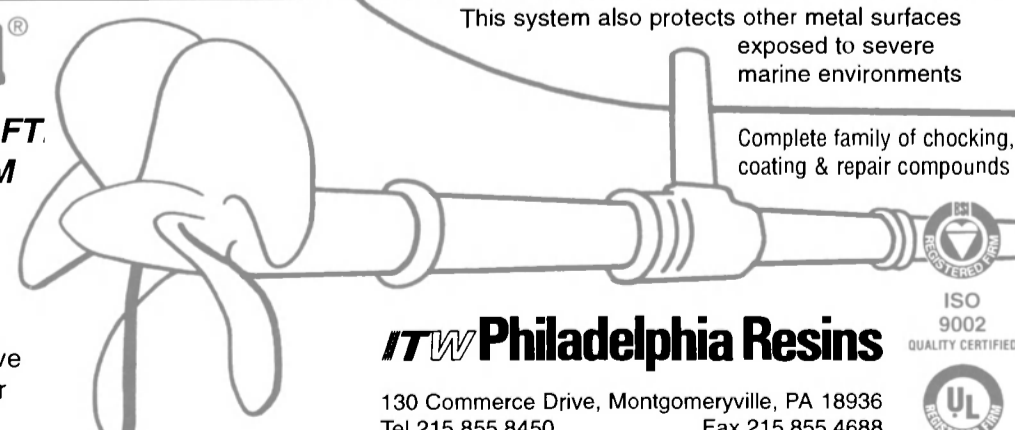
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Dot Com, Maritime Style

Much as has transpired in mainstream consumer markets, the dot com craze has recently enveloped the maritime world with promises of cost savings and operational efficiencies.

While an attrition and natural process of consolidation can eventually be

expected, the world of e-commerce solutions for the maritime market is definitely in its infancy. While it is impossible to judge the full working models in this report, the following text contains synopsis reports on some of the more noteworthy market entrants.

Site Name/Address

Boat-Park.com

Purpose

Virtual trade show for suppliers, manufacturers, distributors, marinas, trade associations and publications

Status

Recently launched by Boston-based Web-Park Corp., Boat-Park.com is an on-line virtual trade show, which seeks to bring together worldwide participants into its virtual trade

show, which is open 24/7. The company's database is designed to bring together thousands of international marine businesses into a logically structured WebPark. Boat-Park.com features boating related businesses, in more than 20 major categories. The company offers a full cadre of marine products, including components, engines, electronics, hardware, plumbing and safety equipment, to name just a few.

Circle 71 on Reader Service Card

Site Name/Address

www.bolero.net

Purpose

Provide a global e-business platform for importers, exporters, shippers and financial institutions

Status

bolero.net, the e-business infrastructure company, has retained the investment bank UBS Warburg to advise on a private placement of shares aimed at leading venture capitalists. The new equity is being raised in order to accelerate the company's business plan. The company has successfully tested the bolero.net system and over 30 major corporations have now signed up as users. The company plans to become a key infrastructure provider for B2B e-commerce and a facilitator of global trade flows. Substantial operating cost savings are expected to be generated throughout the logistics chain for users of the bolero.net system. bolero.net was created by the TT (Through Transport) Club, which serves as the investment vehicle for the world's container fleet carriers, ports and terminals and logistics companies; and the international financial community through S.W.I.F.T. (the Society for Worldwide Interbank Financial Telecommunication).

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efinance-it.com
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Site Name/Address

www.eFinance-it.com

Purpose

Equipment Buyer's Finance Resource

Status

In mid-April CIT Equipment Financing — a well-regarded marine commodity — announced the re-launch of its Web site, eFinance-it.com, which is designed to be a unique application for equipment buyers with a variety of finance and industry resource functions. For 12 months CIT has developed efinance-it.com to a comprehensive site by combining financing functions with relevant industry information for customers and other users. Tailored to the specific needs of the equipment buying community, the site provides CIT customers, vendors, manufacturers and brokers with a complete loan servicing package that includes online credit application, reporting, invoicing and analysis, all in a protected and secure environment.

Circle 73 on Reader Service Card

Site Name/Address

www.etermsys.com

Purpose

Terminal Management for Ports

Status

eTERM is an Internet Terminal Management System that was introduced by Americas Systems, Inc. (ASI) to provide full terminal management functionality for ports, marine terminals and depots at a fraction of the costs of existing systems. The system is capable of accommodating a wide variety of



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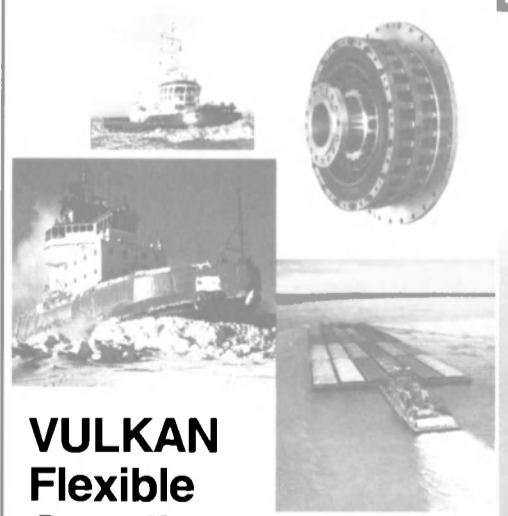
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Site Name/Address

www.marinelink.com

Purpose

Marine Industry News, Analysis and Resources

Status

A product of the Maritime Group — publishers of *Maritime Reporter & Engineering News*, *MarineNews* and *Maritime Week*, Marinelink.com was one of the marine industry's first informational websites when introduced in 1996. The site has quickly evolved to include current and archived marine industry information, news, analysis and directories. Marinelink features a continuous news stream throughout the business day, and featured full archived versions of *Maritime Reporter & Engineering News*, *MarineNews* and *Maritime Week*. Marinelink's keyword searchable database makes information recovery an easy, time-efficient operation. Other key features include: Classified Ads and Job Postings; Comprehensive shipyard, shipping company and equipment supplier directories and "Yellow" pages; and special "Interactive Editions" which allow individuals to quickly and efficiently gather information on key industry companies.

Circle 80 on Reader Service Card



terminals, does not require expensive hardware and software investments, as eTERM takes advantage of the power of the Internet. "Whether terminal operator, carrier, shipper or forwarder, the many features of this product can assist your business," said Steven Bushey, ASI president. The pricing is transaction-based.

Circle 74 on Reader Service Card

Site Name/Address

e4marine

Purpose

Free means to procure goods and services for shipboard use

Status

e4marine is touted as the marine industry's first truly open and free web/EDI business-to-business solution. The site combines the strengths of Unitor, Visma and Umoe, this new service will ensure shipowners, managers and operators with a means to procure goods and services for use onboard. The core application within e4marine provides a solution for the marine procurement cycle, from initial enquiry from the vessel to final payment of the invoice. Income will derive from fees based on the members' savings; telecom traffic commissions; on-site promotion; site sales commissions and Web hosting. Examination of a typical marine purchasing transaction reveals up to 25 distinct steps with an average cost per order transaction estimated at \$150.

Circle 75 on Reader Service Card

Site Name/Address

Equilinx.com

Purpose


A gateway for searching, selecting, and buying ship repair and replacement parts, equipment, and services.

Status

The gateway combines databases of catalogs with a search engine that allows buyers to locate parts for ship repairs and maintenance. Sapient, a leading e-services consultancy, is providing the digital business strategy, creative design, and implementation to power this new gateway. Commerce One, a leader in global e-commerce solutions for business and Vitria Technology, a leading provider of eBusiness infrastructure software, are providing the technological foundation of the initiative. "Equilinx is essentially Web-enabling and streamlining the maritime procurement process for buyers and suppliers."

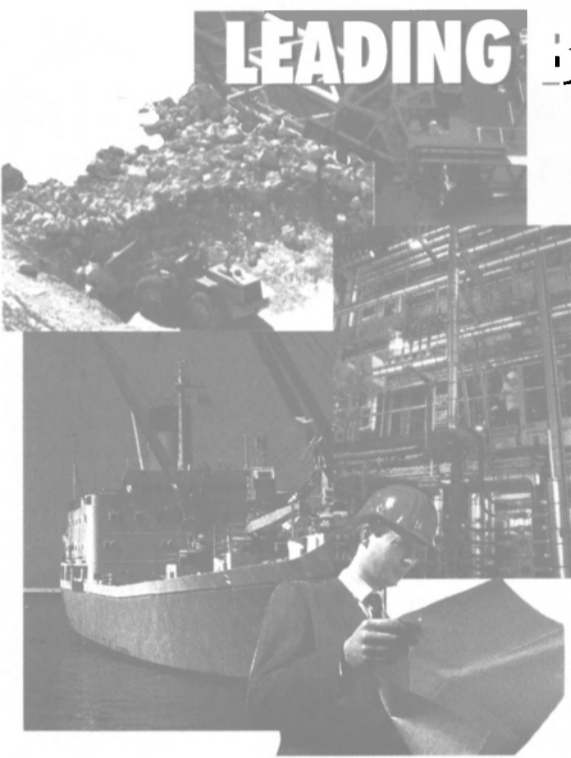


June, 2000



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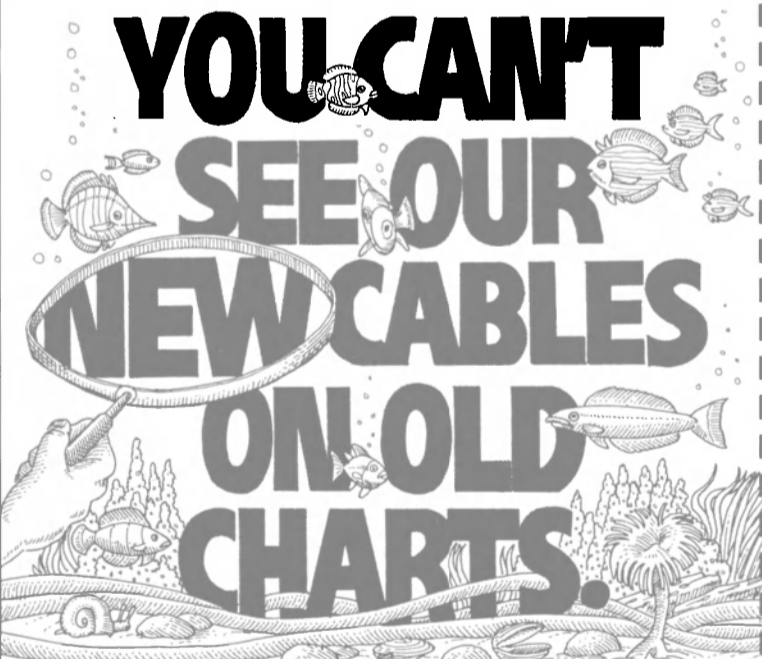
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THE WORLD YEARBOOK • E-COMMERCE

ers. Currently, purchasing agents must sift through many unwieldy catalogs and spend numerous hours tracking down parts and services through phone calls, faxes and e-mails," said **Jim Ungerleider**, CEO and president of Equilinx. Equilinx has signed on several premier buyers and industry suppliers as charter members, including Maersk Line, the world's largest provider of containerized transport solutions, and Osprey Ship Management, Inc.

Circle 87 on Reader Service Card

FreightDesk.com™

Site Name/Address

Freightdesk.com

Status

Freightdesk.com was created by industry insider (or some would say industry 'inciter') **Rob Quartel** — who is well known for pushing the business-as-usual norms out the door and fighting for ideals for the betterment of marine transportation around the world. Freightdesk.com is designed as an easy-to-use Web application service that enables international freight intermediaries to address technology and information needs. The service, which also features a full roster of shipping industry talent, is touted as a revolution in cargo management, enabling business to be conducted smarter, faster and more cost-effectively. The powerful suite of products gives freight forwarders and brokers the tools needed to book, track, move and clear goods quicker, easier and more efficiently. FreightDesk.com offers the ability to:

- Track purchase orders from inception to completion— down to the SKU
- Get detailed visibility into the shipment pipeline
- Exchange shipment information and collaborate across the transportation chain
- Eliminate phone calls, faxes and e-mails
- Track your cargo from computer, PDA or web-enabled phone
- Connect to schedules, tariffs, business tools, Internet marketplaces and other vital information

Circle 76 on Reader Service Card

Site Name/Address

www.GoCargo.com

Status

GoCargo.com is designed to be a leader in the container shipping industry, touting its ability to help shippers — regardless of size — procure cost effective and efficient transportation. Designed for shippers or qualified transportation service providers, the site purports to help users to break through barriers and enjoy a more efficient and profitable way of doing business. Shippers receive multiple competing bids from service providers in an auction format. Shippers make the decisions by viewing and evaluating options. GoCargo.com is independent and has no affiliation with any shipper or service provider. Registration is free.

Circle 77 on Reader Service Card

Site Name/Address

LevelSeas.Com

Purpose

LevelSeas.com is designed to be a leading global marketplace for buying, selling and managing bulk ocean transportation.

Status

Plans were recently announced to create a new Internet-based on-line exchange set to revolutionize the traditional marketplace where ship owners, shipbrokers and cargo owners conduct business. LevelSeas.com

June, 2000

will offer a 'life-of-the-voyage' solution for all seaborne wet and dry bulk commodity shipping. It will provide comprehensive freight management services encompassing market intelligence, online chartering, pre and post fixture activities and risk management tools, including freight derivatives. LevelSeas.com has the backing of BP Amoco, Cargill, shipbroker Clarksons and Royal Dutch/Shell Group — investors who represent significant shipping volume and expertise — and will

accelerate industry-wide adoption of the new marketplace.

Circle 78 on Reader Service Card

Site Name/Address

MAREX.com

Purpose

Marex.com's mission is to provide a central on-line procurement hub for the marine industry that automates transactions, aggre-



gates information and provides related services.

Status

Marex.com is a business-to-business e-commerce solution, open only to marine businesses. Marex.com has developed a proprietary set of procurement solutions that together address the entire marine industry

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THE WORLD YEARBOOK • E-COMMERCE

purchasing lifecycle, from planning through procurement to liquidation. The company has been active in pulling together deals, which enhance the functionality and value of its site, most recently aligning with freightquote.com, a provider of online freight services for shippers and e-commerce companies, to offer its members freight logistics services, including access to online rating, scheduling, tracking, and reporting, using a single electronic interface.

Circle 79 on Reader Service Card

Site Name/Address

mE-World/www.btme-world.com

Purpose

Suite of information, messaging, tracking and transaction services

Status

Launched last Autumn at the Europort exhibition in Amsterdam, mE-World (Mobile Electronic World) aims to provide all of the tools and services to manage merchant marine business from a PC or laptop. "mE-World is a unique and powerful 'total business environment' that puts fleet management into the desktop or laptop," said Patrick Spink, head of external affairs, BT A&M and the mE-World program owner. He added: "It's not a first-generation e-shop that you may enter once a week or once a fortnight. This is a big step forward, an everyday all-day operational environment in which to run a marine business." The front-end to the system is a full-time desktop dubbed mE-Desk, which brings together all the functions of a fleet management office within a desktop environment. It also features a new mE-Mail multi-format communications platform, built on BT's new

ICIS communications engine, which is a unified messaging and information system. With just one inbox and outbox, the user can process all common message formats including telex, fax, voice, video, e-mail, video, graphics and data files, as well as attached files.

Circle 81 on Reader Service Card

Site Name/Address

www.OceanConnect.com

Purpose

Online Marine Fuel Supplier

Status

OceanConnect, which seeks to bring the business of buying ship's fuel online in a fast and price-efficient manner, has lined up a host of industry power in an attempt to make its yet-to-be launched service stand-out among the current and anticipated e-commerce clutter. The most recent alliance was struck with ship broking group Horace Clarkson Pic, which will support OceanConnect.com's initiatives to develop credit insurance and swaps capability to the online marine fuels marketplace. Clarksons — the world's biggest shipbroking group — will also become an equity partner in OceanConnect. Other partnerships include shipping companies Eletson Corporation, Keystone Shipping Co and Stena Bulk AB plus Japan's Nippon Mitsubishi Oil Company and energy information provider Petroleum Argus. The site, which is due up soon, will also feature real-time information on pricing and product availability. Other investors include BP Marine, Fuel and Marine Marketing LLC (FAMM is a joint venture between Texaco and Chevron) and Shell Marine Products.

Circle 82 on Reader Service Card

Site Name/Address

www.Shipbroking.com

Purpose

Cargo Fixing Real Time

Status

Shipbroking.com claimed to have had almost 400 members in less than 30 days of launching. It is designed as an application for owners, brokers and charterers to match each other's requirements in real time. Members post directly their open Cargo, open Vessels and T/C.

Circle 83 on Reader Service Card

Site Name/Address

ShipDesk

Purpose

Independent Chartering Exchange

Status

Unveiled mid last month, ShipDesk is the culmination of work of Tufton Oceanic, a leading shipping investment house; OptiMark, a U.S.-based electronic marketplace developer; Antfactory, a pan-European e-business accelerator; and Whitney & Co., a global private equity firm. The service offers a wealth of industry expertise to support its electronic infrastructure and Dirk Langeveld, former CEO of Tufton Oceanic, is the organization's first CEO. The service purports to offer a highly secure and confidential "total freighting environment," from underlying commodity trade through post-fixture and voyage completion. "ShipDesk will lead the migration of the \$150 billion vessel chartering market to a fully screen-based environment," said

Langeveld. Apart from Langveld, ShipDesk offers a host of maritime industry talent to ensure its services are compatible with its user's needs, including: Lars Hjaltnan, ShipDesk's chief technology officer and former CTO at Gearbulk; Fred Doll, director and former director of H. Clarkson; Christoph Toepfer, product development director and formerly with Tufton Oceanic; Peter Rygaard Andersen, VP Marketing/PR and formerly head of marketing at BIMCO; and Jens-Erik Olsen, head of ShipDesk's Hong Kong office and formerly MD of Trom Asia.

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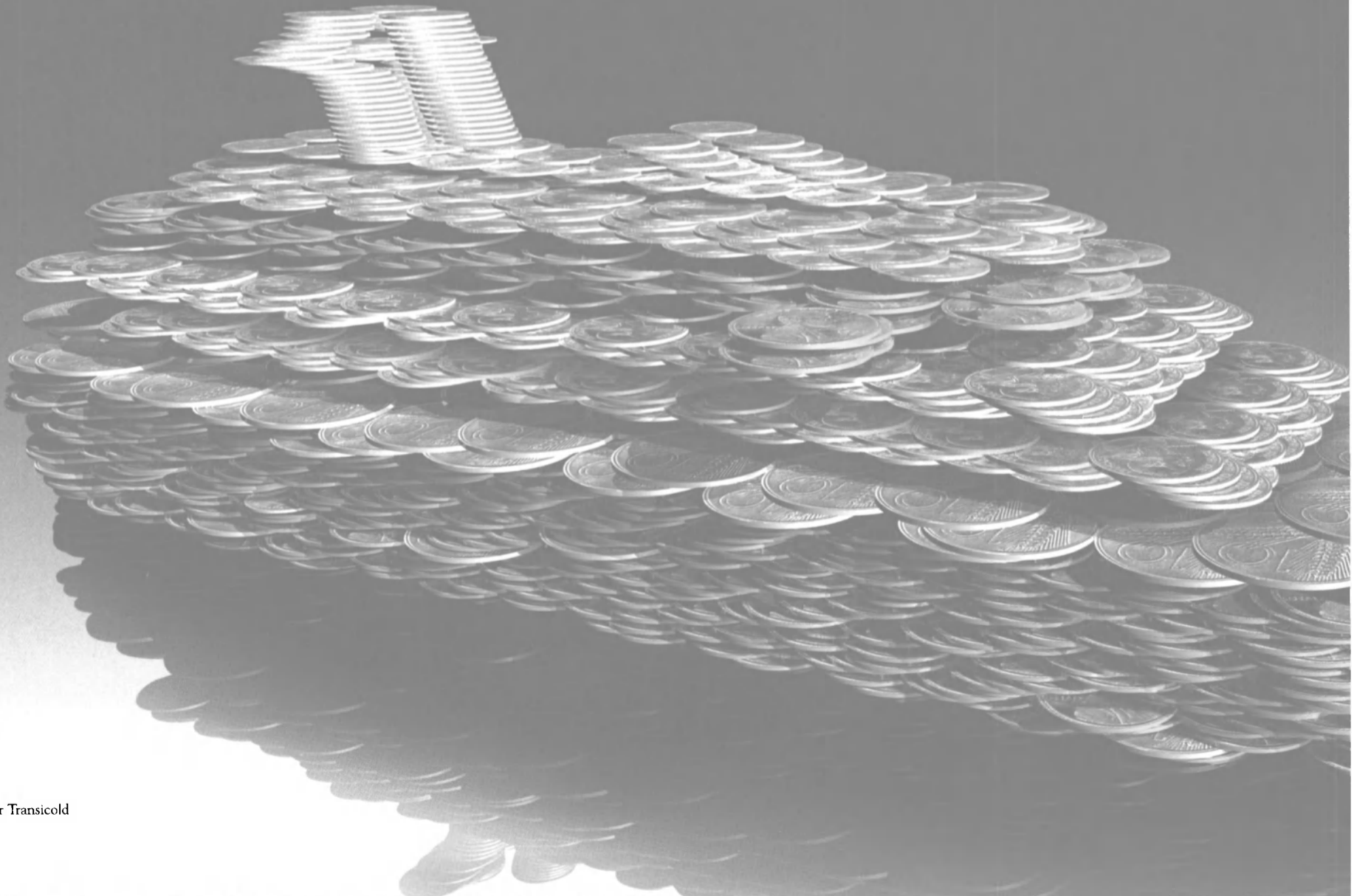
Site Name/Address

www.ShipVertical.com

Status

ShipVertical Internet Group, Inc. (ShipVertical) has launched its Internet marketplace. The company introduced its registration web to business parties worldwide with a plan to roll out — in stages — a number of applications during the second and third quarter of 2000. ShipVertical is a Vertical Marketplace, designed to unite a broad scope of business partners in the shipping industry to transform supply-chain management globally. The site broadly targets organizations involving ship owners and ship operators/managers to manufacturers, distributors, brokers, agents, intermediaries, and suppliers for matters including marketing, sales, procurement, distribution, and delivery. To date the company claims that approximately 600 vessels, together with about 1,000 small, medium, and large businesses in the supply chain, will participate in the marketplace pilot phase.

Circle 85 on Reader Service Card



Site Name/Address

www.tradiant.com

Purpose/Status

See related story, page 36 of this edition

Site Name/Address

www.Transportation.com

Purpose

Customs brokering, insurance, price and delivery data

Status

Still in the developmental phase at press time, Transportation.com, is targeted at small to medium-sized shippers in particular, with services to be provided via the Web site include customs brokering, insurance, price and delivery data, analysis of systems and others. Transportation.com anticipates a second quarter launch and is testing the site. It is being funded by trucking company Yellow Corp. and two venture capital firms, TL Ventures and EnerTech Capital Partners. The company recently named former U.S. transportation secretary Samuel Skinner as chairman of the board.

Circle 86 on Reader Service Card

MTN, DSI Complete Internet Café Installation

Maritime Telecommunications Network (MTN) has installed Carnival Cruise Lines' first Internet Café on the Carnival Triumph. The Internet Café unites Digital Seas International's (DSI) Internet product with the latest in high-speed Internet satellite communications

from MTN. Carnival's 14 other Fun Ships are expected to have Internet Cafes installed by the end of the year.

MTN allows for satellite delivery of the Internet for the cruise lines and the U.S. Navy by providing ShipNet, an asymmetric Internet service, which delivers high-speed connectivity and cost-effective use of satellite space. This technology is making MTN one of the largest Internet service providers (ISP) in the maritime industry. **Dave Kagan**, president of ATC Teleports and MTN said, "These new Internet Cafes are a really exciting development for the cruise line industry, and for MTN. Our cruise line customers can now deliver all the latest services and entertainment their guests are requesting and we are taking a leadership role in making it possible for Carnival."

Circle 61 on Reader Service Card

DCS: High Speed Data To Service Fast-Evolving E-World

As the maritime world quickly embraces the technologies that offer seamless communications anytime, anywhere, it will increasingly be the challenge of communication service providers to ensure that the communication pipeline is kept open and operating

efficiently. Darby Corporate Solutions (DCS) Marine Data Division is a New York-based systems integration firm, specializing in software development and networking technology. It offers Smart-Linc, its first in a family of marine data solutions and services developed to provide high-speed data connections to boats, yachts ships and cruise lines.

Smart-Linc features: internet access on demand; multiple users; a secure environment; video conferencing; streaming media; and broadcast e-mail. Smart-Linc controls and manages the network and communication technologies to provide a 64K high-speed data connection. In comparing its 64K service to slower modes, DCS notes that, for example, the time required to transfer one megabyte of information via a 2.4k line takes 83 min., 12 sec.; a 9.6k line 20 min, 48 sec.; and a 64k line 2 min., 24 sec. Depending on the mariner's cost per minute deal with a communications provider, and the annual amount of data moved from ship-to-shore and vice-versa, it is relatively simple to calculate cost benefits of the DCS system.

Circle 70 on Reader Service Card

Shipowners Should Take E-Commerce Seriously

Shipping accountant Moore Stephens has warned shipowners to take e-commerce more seriously if they want to retain investor interest and commercial advantage. **Philip Cowan**, a partner in Moore Stephens Corporate Finance, said shipowners need to make the effort to find out who is doing what in e-commerce, and why, and then make a judgment about whether or not they can save money by purchasing or dealing through the internet. Owners contemplating a public listing or bond issue should consider an e-commerce dimension, most easily obtained by taking a stake in a developing e-commerce shipping portal, adds Cowan.

Most stock market-listed shipping companies are still suffering low share prices. But Moore Stephens says Norwegian shipping shares have held their value, and attributes this in part to the fact that Norwegian shipping companies have been quick to ally themselves to fledgling dot.com businesses.

As yet, there is little to measure in terms of the performance of the various shipping portals, because few of the sites are actually functioning.

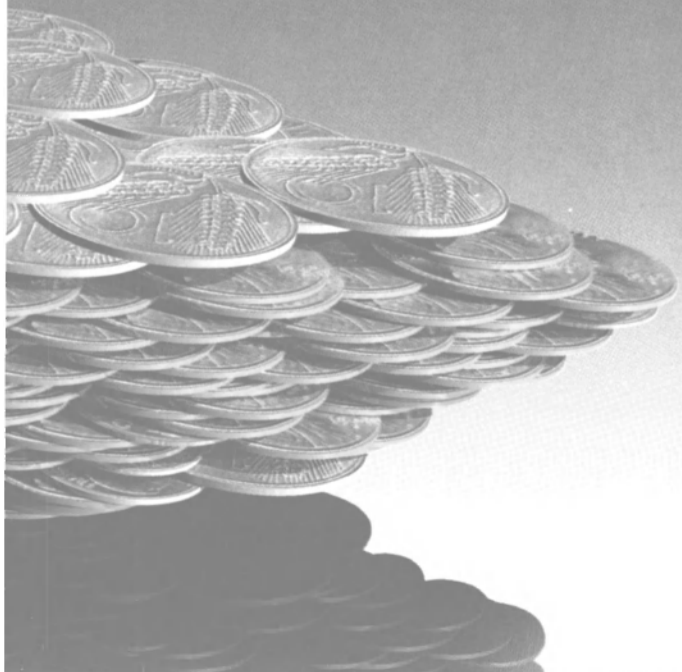
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www.circor.com



Setting a Course For Stability?

To characterize the business of carrying oil aboard tankers of any size or route as stable — would be foolhardy at best. But as curious as the market's undulations may appear to those on the outside, it is in fact the market's instability that serves as stability.

Owning and operating a fleet of petroleum carrying tankers has undoubtedly become a much more scrutinized and legislated endeavor than any time past. The eyes of the world, individual nations and even specific "environmentally sensitive" regions are on constant watch, prepared to strike with the broad sword of legal action in the unlikely event of an incident or catastro-

phe. The heightened sense of legal responsibility has undoubtedly changed, and will continue to shape the tanker business. Simply put, the need to invest in advanced ship-board equipment and systems, to ensure proper training of the entire crew, and to acquire and properly maintain a sound fleet of

ships — whether it's five or 500 ships — is essential to building and maintaining a successful business.

This point was made abundantly clear with the break up and sinking of the Erika last December, an incident which left French beaches badly soiled and European legislators hurriedly conferring on the action to be taken regarding older tankers in European waters. This one event, while obviously not solely responsible for

Owner Type	Existing Tankers By Ownership/Vessel Type							
	Crude		Product		Chem/Specialist		Total	
	No	DWT	No	DWT	No	DWT	No	DWT
Commodity Trade	25	2,947,786	29	731,981	2	44,747	56	3,724,514
Financial Institution	9	1,059,029	15	820,196	2	34,815	26	1,914,040
Government Agency	0	0	1	39,796	0	0	1	39,796
Government Oil Company	99	16,313,313	125	3,992,417	19	492,641	243	20,798,371
Government Shipping Company	205	16,882,284	195	7,054,246	19	454,104	419	24,390,634
Independent Company	4	372,127	4	217,873	10	349,731	18	939,731
Independent Shipowner	1,076	161,390,992	775	31,902,578	421	9,742,195	2,272	203,035,765
Oil Company	91	14,872,935	60	2,102,012	5	96,161	156	17,071,108
Oil Major	83	14,085,099	30	1,259,934	3	99,146	116	15,444,179
Total	1,592	227,923,565	1,234	48,121,033	481	11,313,540	3,307	287,358,138

Source: S&P

Corpus Christi - Sept. 11th

The Lift Boat GULF ISLAND V, a 3-legged jack-up, sank off Corpus Christi, Texas. The vessel sank in 100 feet of water on to her port side with half her deckhouse beneath the sea bed.

Response & Results:

After unsuccessful recovery attempts by others, Titan's salvage team removed the wreck and placed it on shore using the 500-ton sheerlegs Southern Hercules.



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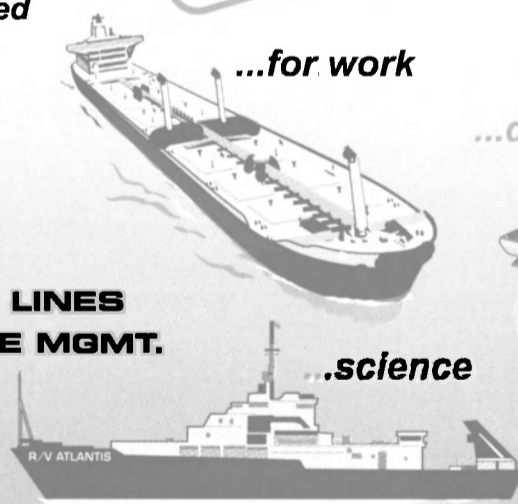
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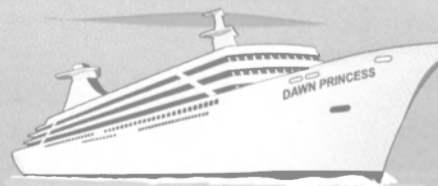
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THE WORLD YEARBOOK • TANKER MARKET REPORT

Existing Tanker Fleet by Dwt./Ownership						
Size Range	Owner Class				Total	
	Independent		Company			
	DWT.	No.	DWT.	No.	DWT.	No.
10-19,999	355	5,106,551	172	2,690,387	527	7,796,938
20-29,999	223	6,010,990	146	3,919,343	369	9,930,333
30-39,999	371	12,999,685	141	4,950,060	512	17,949,745
40-49,999	216	9,595,346	122	5,404,614	338	14,999,960
50-59,999	65	3,588,096	26	1,433,943	91	5,022,039
60-69,999	121	7,813,360	54	3,570,028	175	11,383,388
70-74,999	8	568,412	5	359,949	13	928,361
75-89,999	152	12,970,291	68	5,792,061	220	18,762,352
90-99,999	158	15,149,340	32	3,083,580	190	18,232,920
100-109,999	99	10,435,014	26	2,731,138	125	13,166,152
110-119,999	25	2,818,124	8	921,343	33	3,739,467
120-129,999	34	4,262,055	20	2,499,417	54	6,761,472
130-139,999	48	6,532,969	19	2,563,023	67	9,095,992
140-149,999	65	9,439,923	15	2,200,389	80	11,640,312
150-159,999	43	6,624,545	23	3,576,099	66	10,200,644
160-199,999	8	1,436,218	5	871,784	13	2,308,002
200-229,999	2	456,094	4	884,397	6	1,340,491
230-259,999	92	23,056,542	31	7,793,411	123	30,849,953
260-279,999	64	17,374,949	30	8,149,118	94	25,524,067
280-299,999	62	17,958,759	28	8,084,580	90	26,043,339
300-319,999	43	13,170,944	28	8,536,452	71	21,707,396
320-349,999	8	2,644,200	0	0	8	2,644,200
350-399,999	16	5,857,574	2	734,319	18	6,591,893
400,000+	20	9,079,824	4	1,658,898	24	10,738,722
Total	2,298	204,949,805	1,009	82,408,333	3,307	287,358,138

Source: SS&Y

the yearlong tanker scrapping binge experienced in 1999, is serving as a lightening rod for the "buy new, scrap old" push.

According to data from London shipbroker Simpson, Spence & Young, there were 99 commercial tankers scrapped in 1999, representing 14,358,138-dwt. Including ships lost at sea (2/177,057-dwt), converted (8/1,378,148-dwt) or listed as "other" (28/1,583,475-dwt), there were a total of 137 tankers representing an aggregate 17.5 million-dwt. While these totals are indeed impressive and would have been thought to help substantially boost tanker rates and prospects, it must be countered with the fact that there were 194 tankers (19,139,118-dwt) delivered in 1999, leaving the world with a net gain of 57 tankers and about 1.8 million-dwt.

Beyond the literal effects of increased legislation, Erika has had a profound effect on the psyche of companies that own and operate tankers. Despite conclusive evidence from such noted and respected sources such as Oslo-based Intertanko that age in and of itself is not a determinant of a tanker's ability to safely operate, there has been a noticed turn away from 1970's built tonnage and a preference for new ships. Given the explosive public response against all oil carrying companies in the wake of any disaster, it is little wonder that the "buy new" philosophy is as prevalent. Combined with the fact that, astonishingly, the price for newbuild tankers has stayed steadied — or in many cases — actually dropped, the fact that shipowners are investing in new tankers should not be a surprise.



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Look to the leader. Look to Sea Tel.



THE WORLD YEARBOOK • TANKER MARKET REPORT

Markets Redefined

The reality that it generally costs, in inflation adjusted dollars, less money to buy a VLCC today than it did nearly 20 years ago defies economic principles. Exacerbating the situation further is the dropping prices in face of increasing demand, given the above referenced Erika incident and the increased busi-

ness expected from OPEC's output upturn and the oil-hungry rebounding economies of the Far East. At the heart of the pricing conundrum is an excess of newbuilding capacity, particularly the mandate by Korean shipyards to expand capacity substantially in an effort to outperform its traditional shipbuilding rivals. While the condition has been

long-lamented privately and publicly, particularly in the European shipbuilding community, and despite the recent "agreement" to curtail the number and level of subsidies, many officials and analysts speculate that the continued levels of output from Korea will lead to dire results for shipbuilders around the world. The scope of Korea's dominance,

particularly in the tanker realm, is clearly evident in the numbers from SS&Y. In the second half of 1999, South Korean shipyards secured 33 of the 62 new contracts placed in the July-December period. At the end of the year, its shipyards accounted for 55 percent of the tanker tonnage on order. By comparison, Japanese shipbuilders, which are saddled with a strong Yen, received only 12 tanker orders during this period, according to SS&Y.



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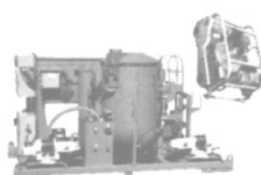
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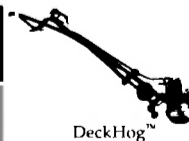
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The new ARCO Millennium Class Tankers are designed to meet or exceed the latest ABS rules with double bulkheads and twin-engine rooms with a continuous bulkhead from the keel to the top of the stack and twin rudders. Each engine room is designed and equipped as a separate, independent space. ARCO Marine will operate with these double hull tankers for the weekly 2,400 mile round trip voyage from Valdez/Alaska to Cherry Point, Wash. for Alaskan crude-oil transportation. The Millennium Tankers are being built at Litton Avondale Shipyard. The main propulsion engines are from Manises Diesel Engine, Madrid, Spain. They are two-stroke MAN B&W 7S50MC - C delivering continuous power of 11,060 kW at 127-rpm. The engines are lighter and shorter while delivering higher power rating. Renk secured the contract from Manises for the delivery of the complete PTO plants. Connected with the engines through Vulkan RATO-S 7331 flexible couplings is one BSL 225 Renk PTO gear unit each to drive a generator, capable of developing at 1,200 rpm an electrical output of 8,600 kW for onboard requirements, i.e. especially for the cargo pumps. The propeller thrust bearings are arranged separately and comprise a redundant hydraulically operated disk clutch (Renk patent) for separating or connecting the main engine and propeller in operation. The main reason Vulkan Couplings were chosen is the excellent torsional vibration characteristic of the RATO-S Coupling.

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THE WORLD YEARBOOK • TANKER PRODUCTS

Consilium Selesmar Introduces New Series

Proceeding the success with its ARPA series, Consilium Selesmar has followed up with its new NavBat ATA radar, which stands for Automatic Tracking Aid Radar. This anti-collision radar is well-suited for vessels from 3,000 to 10,000-gt, where ARPA radars are not compulsory. Employing Consilium Selesmar's fourth generation radar,



NavBat is fully compliant with the new SOLAS Chapter V carriage requirements for vessels of 3,000-gt and higher. Features include advanced radar data processing, an ultra-

low-noise Mosfet transceiver and exceptional clutter suppression techniques. NavBat is in compliance with IMO Resolutions A.222 (VII), A.477 (XII), MSC.64 (67) and A.278 (VIII), and its modular design allows for total configuration flexibility - with choice of S or X frequency band transceivers.

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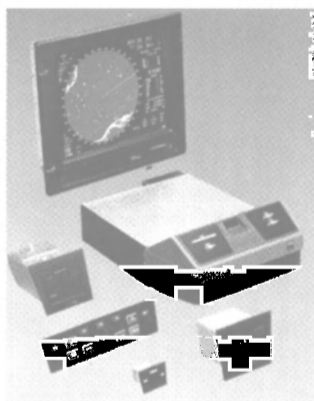
Litton Marine Features New Flat Screen

Litton Marine Systems' newest addition to its product line is a new series of fully type approved BridgeMaster E marine radars boasting flat-screen displays.

The E 250 radars are reportedly the first flat-screen models to be approved under the IMO requirements for conventional

and high-speed craft.

Measuring just 4.5-in. thick, the flat-panel display modules are designed to provide wide view-



ing angles and a bright clear picture in both direct sunlight and at night — resulting from its ability to dim the display almost to extinction. In compliance with IEC 60945, an active matrix 20.1-in. LCD display provides a resolution of 1,280 x 1,024, while an EMI protective shield guards against interference with other area electronics.

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New Variable Speed Drive Eliminates Shut Downs

UCI-ALSTOM Integrated Drive Systems showed its ALSPA MV3000 to the North American market. Developed by U.K.-based drive manufacturer, MV3000 is the fifth generation of variable speed motor drives offered by

Alstom. The new series features drives from .25 kW to 3,600 kW and incorporates advanced 'fuzzy logic' for the elimination of 'self-protection' shut downs — a costly glitch that disturbs traditional drives. MV3000 is capable of rolling through power fluctuations, short power loss and shock loads. The system also monitors the temperature of the motor,

as well as the drive itself, and alerts the operators for a permanent solution.

Controlled by a traditional PC and/or Alstom's own keypad controller, the user interface is consistent throughout the MV3000 drives so that an operator can use a variety of drives — from the smallest to the largest.

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THE **WORLD** YEARBOOK • CONTAINERSHIP MARKET REPORT

The New Age of Containerization

While the 1970s could be called the decade of the tanker, and the 1980s that of the bulk carrier, without a doubt the

1990s will be most widely recognized in maritime circles as that of the container-ship. Explosive fleet growth — from

1.768 million TEU in 1990 to more than five million TEU estimated by 2001 (source: Clarkson Research Studies) —



photo credit: **Walter Garschagen** - 1998

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coupled with corporate consolidations has conspired to create operational and cost efficiencies that promise to drive the industry for the next decade as well.

Until the early 1990s, fixtures in the containership market were not even equal to that of the Handymax bulker segment. In 1980, the entire fleet was comprised of 750 ships, versus the 1,800 recorded by the end of 1995. While the move to containerization has been pronounced, it has been marred by rate instability due in large to the almost surreal level of newbuilding activity in the early- and mid-1990s. In analyzing the Container Market Movements in its report, *Maritime Industry - Spring 2000 Outlook*, ING Barings notes that there has been a noticeable shift in the ownership profile of the orderbook between the charter owners and the operators owners (liner) over the past 12 months or so, a trend which ING Barings reasons indicates superior strength and profitability in the charter market.

While the top 20 owner operators still control more than 50 percent of current containership fleet capacity, with the top 20 charter owners controlling roughly 18 percent, the orderbook at year-end 1999 reveals a control ship: the top 20 liner companies' portion of new orders dropped to about 43 percent from 52 percent, with the top 20 charter owners picking up the slack.

In its report, ING Barings classifies the containership market development in the following four phases:

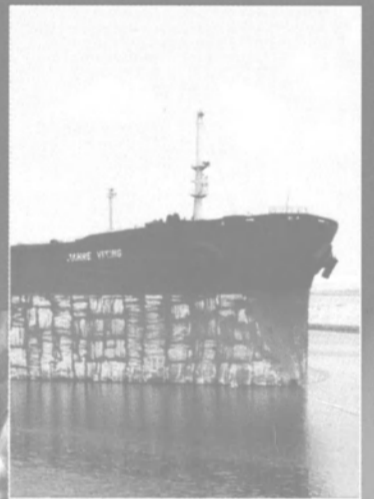
Phase 1 (1993-1996): Rapid Maturation: In the early 1990s, containership demand was met with a new design, big-
(Continued on page 100)



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The Year of Little Change

Despite the generally strong economic recovery in Asia, there was little change in freight rates in the Dry Bulk market segment. The year 1999 turned out to be much the same of 1998 where average freight rates are concerned, as the yearly average tripcharter rates for modern Capesizes fell to \$8,500/day, which is approximately \$1,100 lower than in 1998. Rates for modern Panamaxs increased to \$7,500/day, up about \$800 from the previous year. For modern Handymaxes, the average tripcharter rates remained basically unchanged at \$6,800/day. The freight rates did, however, start the year at levels substantially lower than they ended. The main reason for the extremely weak start to the year was a considerable stock depletion in the steel industry during the first half. During the second half, however, R.S. Platou noted increasing activity in mineral trades and brisk grain activity.

Ship values entered the year at low levels, but began to appreciate during the first quarter. The firmer trend continued through most of the year. At the end of the year, prices for 10-year-old ships were, in general, 30 percent above their levels at the beginning of the year. In addition, due in part to firming freight markets, there was a slightly higher new-building price for bulk carriers. But looking at 10 year trends (see Figure 1), it is plain to see that the long-term valuation of 10-year-old tonnage, particularly in the Capesize segment, is approaching the bottom.

The dry bulk fleet (see Figure 2), increased only by 0.3 percent from 1998 to 1999. A slight reduction in combined carriers engaged in dry trades resulted in a 0.2 percent increase in the operating dry bulk fleet.

The active Handysize fleet increased a modest 0.4 percent, while the operating Panamax fleet expanded by about 1.8 percent. The Capesize fleet was reduced

by 0.7 percent. Deliveries of bulk carriers totaled 13.5 million-dwt, while deletions of bulk vessels amounted to 9.4 million, and 0.9 million-dwt of combined carriers were scrapped. Thus, the fleet



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Avg. Freight Rates

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Tripcharter	1997	1998	1999
Handymax	8.8	6.7	6.8
Panamax	10.3	6.7	7.5
Capesize	14.2	9.6	8.5

Source: R.S. Platou a.s., The Platou Report 2000

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THE WORLD YEARBOOK • DRY BULK MARKET REPORT

Fig. 1 MARKET VALUES FOR BULK CARRIERS 10 YEARS OLD

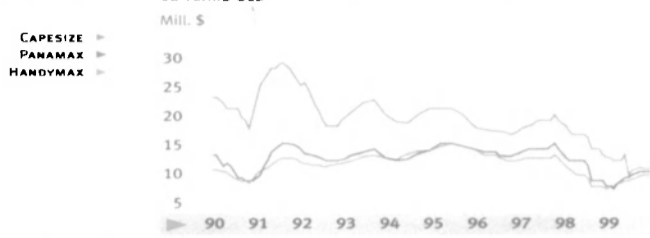
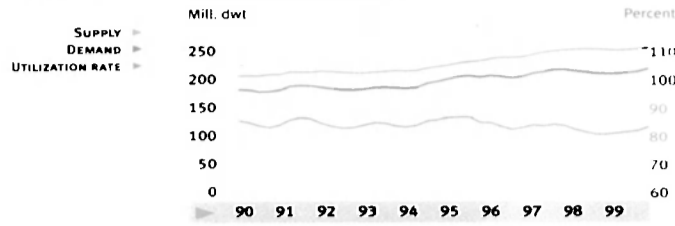


Fig. 2 SUPPLY, DEMAND AND UTILIZATION RATE DRY BULK FLEET 10,000 DWT+



expanded by about 4.1 million dwt.

About 12 million dwt of bulk carriers are scheduled for delivery in 2000, and the extent of the scrapping program will depend largely by the current and future expectations as to freight rate levels. However, it is important to remember that about 10 percent of the existing fleet is above the average scrapping age for bulk ships, and it would therefore seem likely to expect that the age element may have a more noticeable impact on scrapping attitudes in the coming years than before. Taking all likely scenarios into consideration, R.S. Platou estimates a fleet increase by about two percent between 1999 and 2000.

Sea borne Shipment Trends

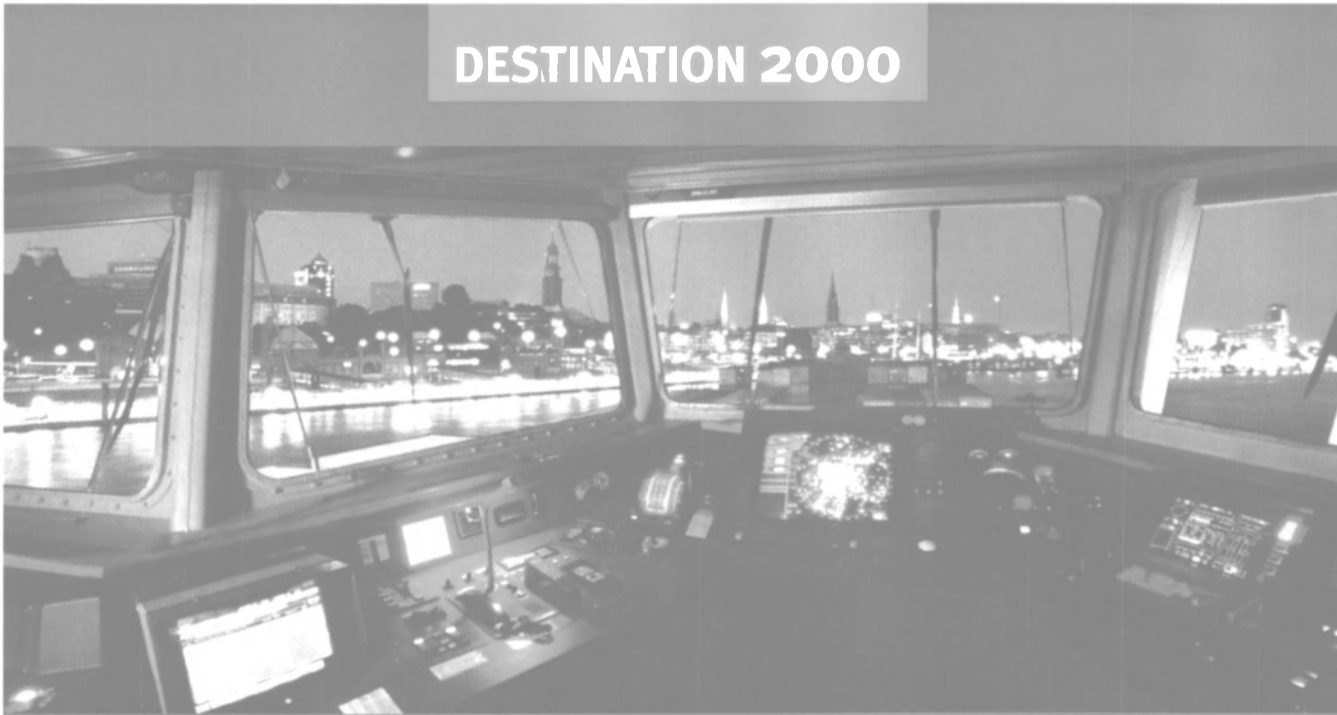
Preliminary estimates indicate an approximate one percent increase in world sea borne trade in the dry bulk segment from 1998 to 1999. R.S. Platou noted shorter average distances in coal and steel products trade, and therefore the tonnage demand increased slightly less than the volumes. Among steel related products R.S. Platou suggest a drop of about one percent in iron ore shipments, while coking coal transports remained basically unchanged. Imports of steel scrap into Asia increased, but into Europe (Turkey), it fell, and preliminary estimates suggest a moderate increase in shipments of finished/semi-finished steel over the year. Imports into the U.S. fell from 38 million tons to about 32 million tons in 1999, and imports into Western Europe fell approximately two million tons. Conversely, steel imports into Asia rose significantly, more than compensating for these drops.

Grain exports increased by more than five percent in 1999 due to higher import requirements in the Middle East, Northern Africa and Asia. Among other dry bulk commodities, R.S. Platou recorded an increase of about three percent in sea borne trade of forestry products.

For the current year, R.S. Platou is expecting the total sea borne trade in dry bulk cargoes to increase in the region of three to four percent. There are no drastic trading pattern changes foreseen, so that tonnage demand ought to increase at approximately the same rate as volumes. However, it is necessary to take into consideration the trend where minor bulk cargoes, such as forestry and steel products, will be transported in containership. If the trend continues, it will of course have a negative impact on the tonnage demand for Handysize bulk carriers.

By Bjorn Boddling, R.S. Platou's Economic Research a.s., as excerpted from The Platou Report 2000.

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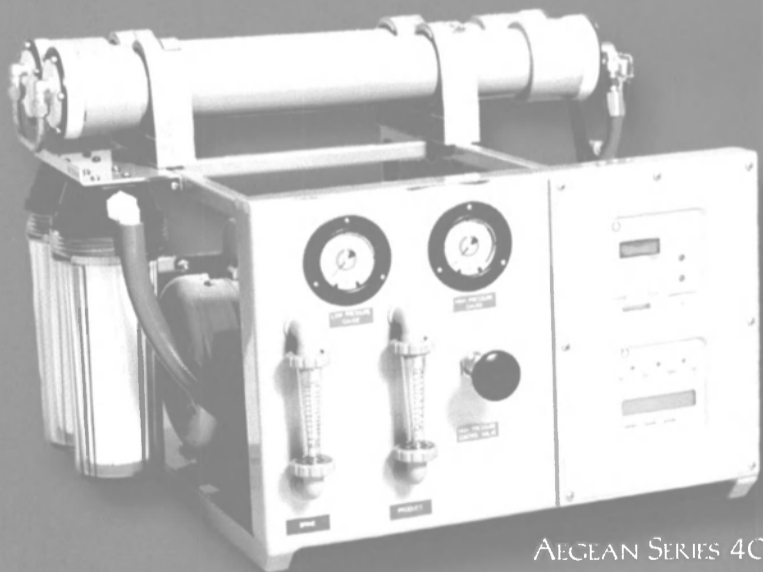
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New Cruise Ships on Order

Source: CLIA

Cruise Line	Name	Tonnage	Berths	Delivery
Carnival Cruise Lines	Carnival Conquest	110,000	2,974	Fall 2002
Carnival Cruise Lines	Carnival Glory	110,000	2,974	Summer 2003
Carnival Cruise Lines	Carnival Pride	84,000	2,124	Late 2001
Carnival Cruise Lines	Carnival Spirit	84,000	2,124	Early 2001
Carnival Cruise Lines	Carnival Victory	102,200	2,758	Aug-00
Carnival Cruise Lines	Carnival Legend	84,000	2,124	Summer 2002
Carnival Cruise Lines	Unnamed	110,000	2,974	Fall 2004
Celebrity Cruise Lines	Infinity	91,000	1,950	Feb 2001
Celebrity Cruise Lines	Millennium	91,000	1,950	Jun-00
Celebrity Cruise Lines	Millennium III	91,000	1,950	Sep 2001
Celebrity Cruise Lines	Millennium IV	91,000	1,950	Jun-02
Costa Cruise Lines	Costa Atlantica	84,000	2,112	Jul-00
Cunard Line	Queen Mary 2	150,000	2,800	2003
Crystal Cruises	Unnamed	TBD	TBD	TBD
First European Cruises	European Dream	58,600	1,500	Apr-02
First European Cruises	European Vision	58,600	1,500	Jun-01
First European Cruises	Unnamed	80,000	2,000	Jun-05
First European Cruises	Unnamed	80,000	2,000	Jun-05
Holland America Line	Amsterdam	61,000	1,380	Sep-00
Holland America Line	Unnamed	84,000	1,800	2003
Holland America Line	Unnamed	84,000	1,800	2004
Holland America Line	Unnamed	84,000	1,800	2005
Holland America Line	Unnamed	84,000	1,800	Fall 2002
Holland America Line	Unnamed	84,000	1,800	Summer 2003
Holland America Line	Zaandam	65,000	1,440	May-00
Norwegian Cruise Line	Norwegian Sun	80,000	2,000	Sep-01
Norwegian Cruise Line	Unnamed	91,000	2,300	Oct-02
Princess Cruises	Golden Princess	109,000	2,600	Apr-01
Princess Cruises	Ocean Princess	77,000	1,950	Feb-00
Princess Cruises	Unnamed	109,000	2,600	Jan-02
Princess Cruises	Unnamed	88,000	1,950	Oct-02
Princess Cruises	Unnamed	113,000	2,600	Jul-03
Princess Cruises	Unnamed	88,000	1,950	Jun-03
Princess Cruises	Unnamed	113,000	2,600	May-04
Seven Seas Cruises	Seven Seas Mariner	50,000	700	Mar-01
Royal Caribbean Intl	Adventure of the Seas	142,000	3,114	November 2001
Royal Caribbean Intl	Brilliance of the Seas	85,000	2,000	Jul-02
Royal Caribbean Intl	Explorer of the Seas	142,000	3,100	Oct-00
Royal Caribbean Intl	Radiance of the Seas	85,000	2,000	Feb-01
Royal Olympic Cruises	Olympic Explorer	25,000	840	Spring 2001
Royal Olympic Cruises	Olympic Voyager	25,000	840	Jun-00
Silversea Cruises	Silver Shadow	25,000	388	Sep-00
Silversea Cruises	Silver Whisper	25,000	388	Summer 2001

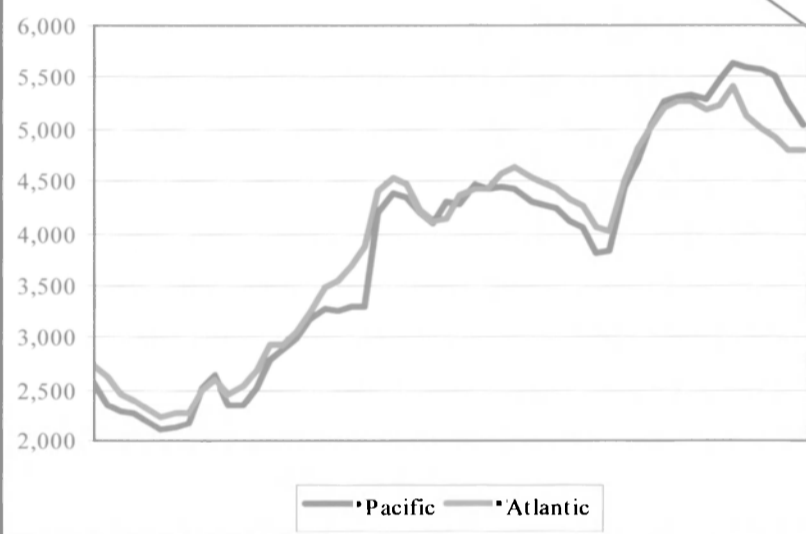
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Crewboats: More Size, Weight And Power

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Africa and Mexico. As their size has grown, so has the horsepower employed by these boats as customers demand greater load capacities and greater



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speed. "The trend in the 170-ft. (51.8 m) class of boats is to more power and faster speeds," affirms Swiftships' **A.J. Blanchard**, at the Morgan City yard. "These boats have gone up in power from four 1,000-hp engines to four 1,350-hp engines and bigger jets. We've had more interest from both U.S. and foreign customers in all jet boats since the increase in jet size has removed concerns over the loaded speeds," Blanchard adds.

Diamond Services has two of the big jet boats on order for delivery in December and February 2001. As much as any operator, the firm has experimented with a variety of engine and jet manufactures. Their next two 170-footers will have Kamewa jets mated to four Cummins KTA38M2 engines rated for 1,350 hp at 1,950-rpm. Another change on the new boats is the increase in seating capacity from 64 to 75 seats. In U.S. waters, with the long runs out to the deepwater rigs, the boats' primary role is in quick delivery of cargo. In Mexico, where Diamond Services have been chartering some of their vessels on shorter 40-mile runs, the passenger capacity is more important. Speed is also important and reports are that some Mexican customers will clock vessel speeds with radar to assure that advertised speeds are met.

This quest for speed, as well as reliability when operating overseas, prompted Diamond Services to return to Cummins after trying another manufacturer's engines in a 185-footer. Their first 170-footer, Paul Kay, was powered by four Cummins KTA38M1 engines with the



Gulfcraft's veteran yard superintendent "**Gippy**" LaCoste, at work on one more crew boat.

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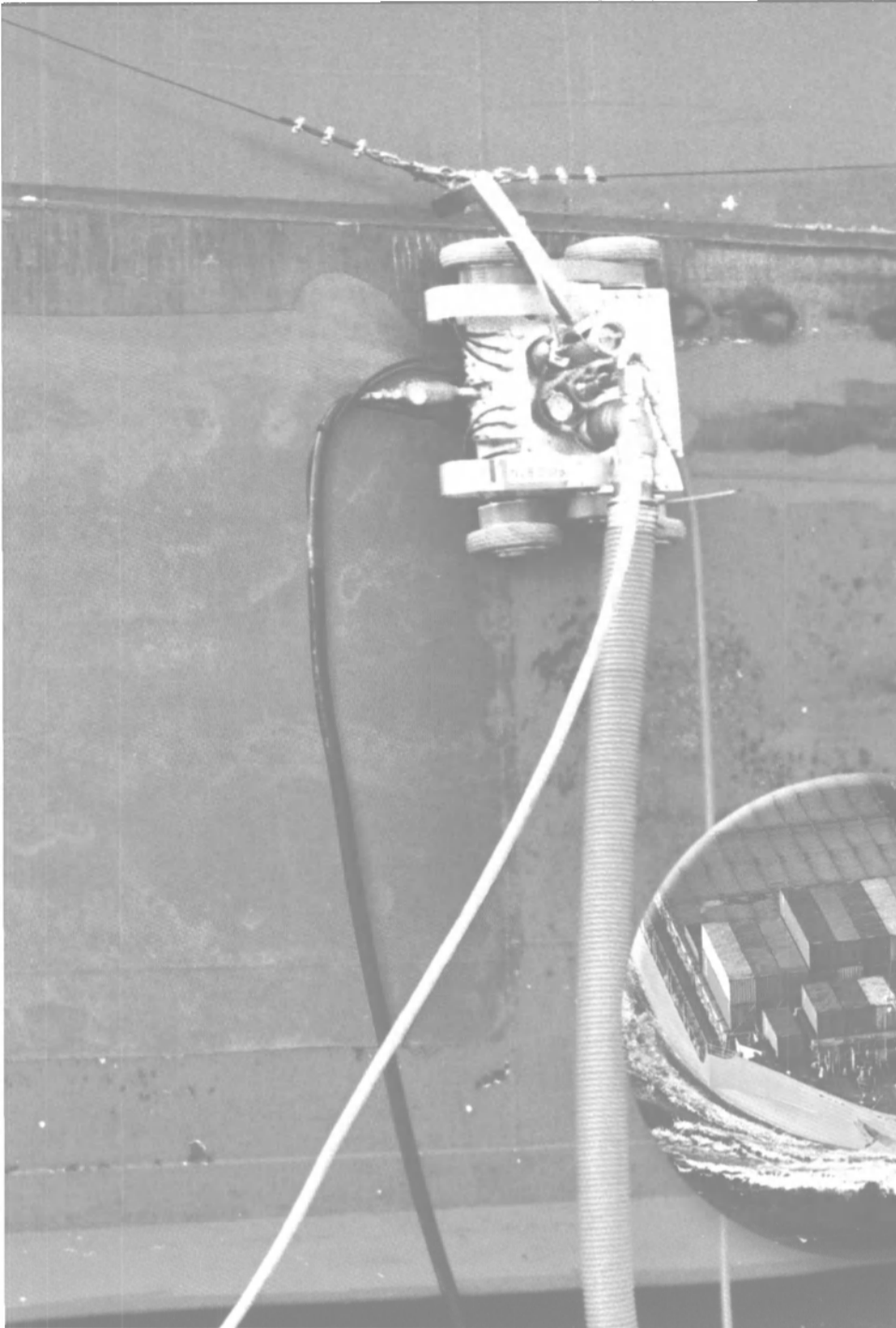
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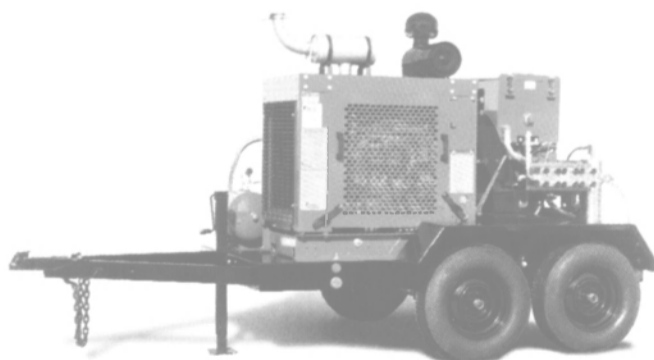
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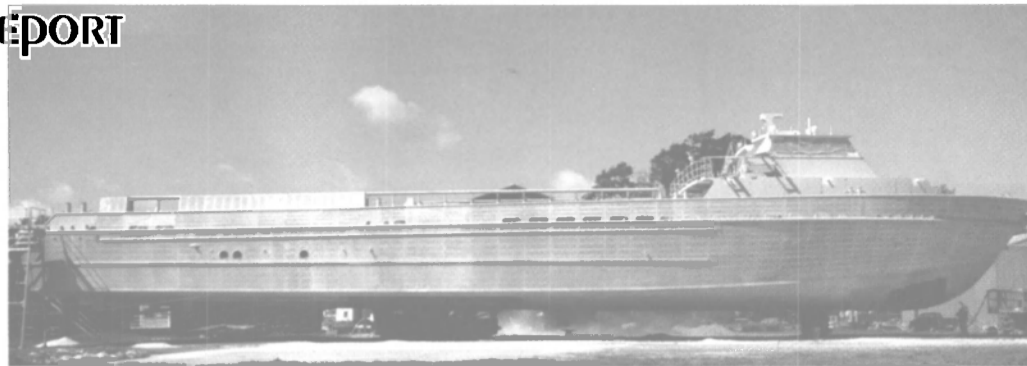
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lower rating of 1,000-hp at 1,800-rpm. The new boats are powered with the same displacement KTA38 engines, but in the higher M2 rating, which delivers 1,350-hp at 1,900-rpm. "We have lots of hours on the KTA38 M1s," says Diamond Services' **Mike Swiber**, "and we like the service and support we have

been getting."

Kenny Nelkin, whose blue-hulled Candy Fleet is looked to by many in the industry as a state-of-the-art trendsetter, also has a pair of 170-footers under construction at Swiftship. Like Diamond Services these will be powered by four 1,350-hp, KTA38 M2 mains but the



The crew boat "Charles F. McCall" being readied for painting.

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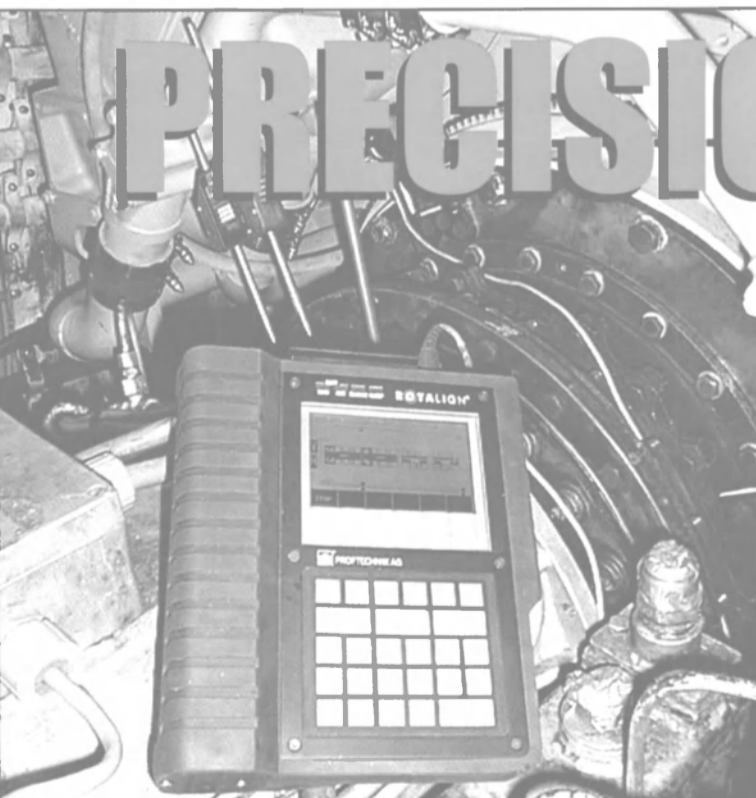


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Candy boats will use the big Hamilton model 651 jets. Nelkin's last series of crew boats were 145-footers with four six-cylinder 700 hp Cummins KTA19 M4 engines driving props and a single 12-cylinder 1,000-hp KTA38 M1 driving a Hamilton 571 water jet. (Note: The numbers 19 and 38-in. Cummins engine models signify their displacement in liters.) This move to larger boats with an increase in combined horsepower from 3,800 to 5,400 assures Nelkin's customers that he will have boats with the speed and cargo capacities that they are demanding for the deep water projects in the Gulf of Mexico. Nelkin is not interested in overseas contracts at the present time, "We usually get a little above what ever the market is because we have new equipment," he says of the domestic market, "It isn't worth Candy Fleet to take two or three boats overseas if we don't have the shore-based infrastructure set up. It is just too expensive and the rates are no better than here in the Gulf. We are able to keep our bigger boats like the 220-ft. (67 m) DP capable supply boats as well as the 145 and 170-ft. crew boats working here at our preferred rates."

In 1998-99, Gulfcraft Boatbuilders of Patterson, La. delivered the three largest crew boats to date to Secor/McCall Boat Rentals of Cameron, La. It was these 185-footers that pioneered the transport of cement, Barite and gel in removable deck tanks. Powered by six KTA38 M2 engines for a total of 8,100-hp the fourth of these boats is currently on order from Gulfcraft. In addition to the Cummins main engines this boat has a Cummins



Cummins Mid-South Territory Sales Manager "Red" Cunningham with A.J. Blanchard of Swiftships in Morgan City.



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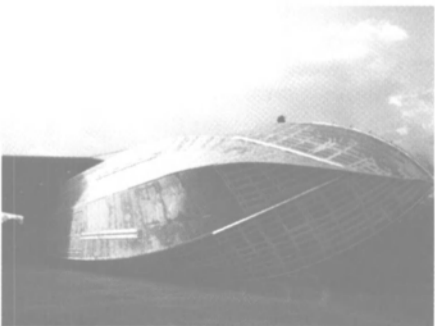
THE WORLD YEARBOOK • U.S. MARKET REPORT



Calvin Klotz, Vice President for the Marine division of Cummins Mid-South, reports record sales of the Cummins KTA38 M2 rated at 1,350-hp.

855-powered 300-hp drop down bowthruster. The popular yard also has four 120-ft. (36.5 m) crew boats each powered by three KTA38 M2 engines on order for Shell/Nigeria. At 4,050-hp these are considerably higher powered than previous vessels in their size range, with enhanced loaded speeds being gained through increased horsepower. Gulfcraft's **Kevin Tibbs** explains the increases in horsepower that his clients are looking for, "Ten years ago you wanted 21-knot average operating speeds. Now you need a 23-knot average operating speed. With the distances increasing that two knots makes a difference."

In addition to their boats building at Gulfcraft, McCall's Boat Rentals have boats building at Neuville Boat Works in Loreauville, La. The Neuville yard, currently operated by **Kerry and Errol**, the second generation of the family in the business that their father **J.O. Neuville** established in 1969, will deliver a 170-footer to Seacor/McCall at the end of June with another to follow in November. Both these boats are sisters to Sara F. McCall, which is currently in service. The June-delivered Charles F. McCall, named to honor Seacor president **Charles Fabrikant**, continues the practice of the McCall fleet bearing the name of its founder Norman McCall. Through his company, McCall Boat Rentals, McCall continues to operate



Hull 1255 at Breau Brothers.

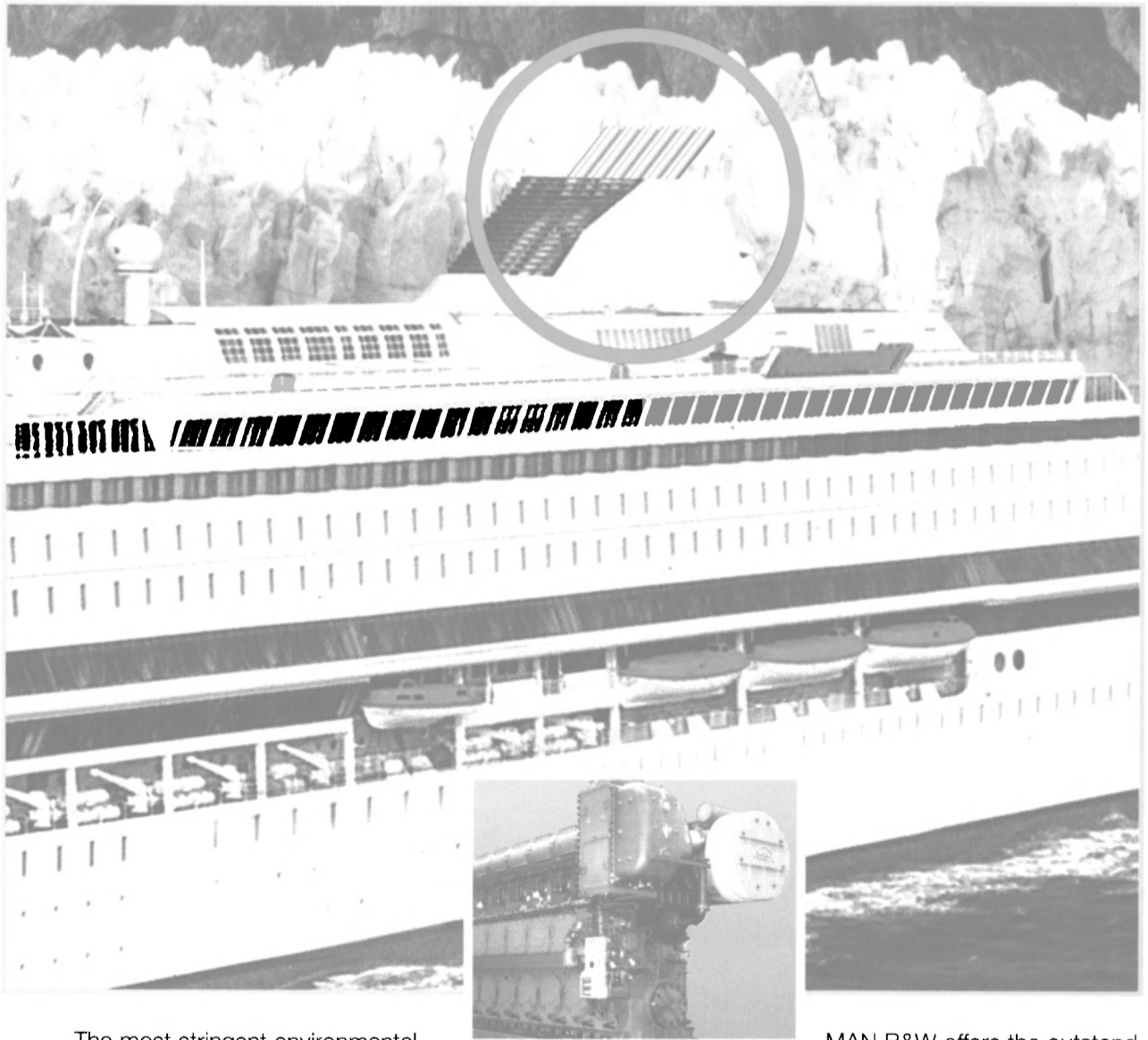
the Seacor/McCall fleet of crew boat with his son Joe as operation manager. Joe explains that "The only segment of the boat industry that is not saturated are the big crew boats, which have been at 100 percent demand. I don't see any tied up. But we are starting to catch up with demand now." The McCall family puts a great deal of thought into anticipating

Gulf and international market demands well ahead of the decision to build. Typical delivery times are approximately 12 months for these big boats from the decision to build and considerably longer if you include lead time in booking slots at the five yards that build them. With more 80 crew boats ranging from 110 ft. (33.5 m) to 185 ft. (56.3 m),

McCall has built to optimize variety in size, power and rates in order to have the right boat to meet a customer's needs at the right price. By building in flexibility in power and optional equipment they keep their boats in demand in a shifting market.

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that fair back up into the hull when not in use. Their 34-in. nozzled props are powered by 250-hp hydraulic motors driven Cummins C-series engines. While handy when working under a rig, these would be invaluable in working as a fast response vessel with Seacor's National Response Company in the event of an oil spill. The azimuthing

bow thruster would give the vessel a high level of maneuverability in tasks such as spraying dispersant. This is just one example of the McCall flexibility. The current boat being built will be plumbed for fire monitors that can then be retro-fitted as required. The next boat off will have two 1,500-gpm pumps mounted on the front of two of the

main.

Obviously comfortable with serving markets outside of the U.S., McCall delivered Sara F McCall, in November 1999 under a bare boat charter to a Mexican firm. Under the provision of the charter all crew and maintenance will be handled by the Mexican charterers. That boat, like her two sisters has additional



Joe McCall (center) explains to "**Red**" **Cunningham** (left) and **Earl Neville** (right) his family's attention to detail such as the small hole drilled in the shaft strut to reduce cavitation at that point.

passenger spaces in separate rooms that are wired for — and can easily be converted to — additional bunk rooms. At the charterer's request, Sara was equipped with aircraft type reclining seats. For boats that will be carrying a lot of passengers, comfort is important says **Joe McCall**, explaining that if crew boats were to work in Asia, where crews currently travel up to 180 miles one way by helicopter, "passenger comfort and vessel speed would be paramount." In the U.S. Gulf, helicopters are relatively inexpensive and so do most of the crew transport, while in Africa long runs and expensive maintenance for helicopters, gives the edge to crew boats.

Measuring 170 x 34 ft. (51.8 x 10.3 m), The McCall boats are deep and heavy, "Five years ago no one was concerned about speed," explains Joe, "Twenty-one knots was fine, now Mexico requires 25 knots. Five years ago we worried about fuel economy and we built with KTA19 engines at 700-hp. Now speed and cargo are all important so we are using the KTA38s at 1,350-hp. With their 14 ft. (4.2 m) midship depth, Charles and Sarah are built super heavy for handling the seas as well as up to 2,200 cu. ft. of cement, barite or gel in two tanks that can be installed as temporary deck equipment in 1.5 hours. The weight, gives these boats an advantage as it makes them more comfortable in seas." The big crew boats can handle smaller amounts of most of the cargos that their big cousins, the displacement-hulled supply boats, can take. The 170-footers are capable of around 396 tons total cargo including deck and fuel.

Just down the bayou from the Neville yard, **Vance** and **Ward Breaux** carry on the family boat building tradition at Breaux Brothers Enterprises, Inc. Here, as in the other yards, the trend to big

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boats and big power is evident. Two 155-footers are building for Barry Graham, each with four Cummins KTA38 M2 engines. Tidewater has a 155-footer with the same power package on order at the yard. Breaux claims the fastest hull design with a deep-V entry with the deadrise flattening aft. "The hull design has a lot to do with speed," says **Vic Breaux, Jr.**, "But we'll wheel our boats to whatever the customer wants. We'll put on 46 x 46-in. props for 28 knots and 70 tons of deck cargo or 46 x 44-in. work wheels for 180 tons and 24 knots."

On boats more than 155 ft. (47.2 m), Vic likes to add a bowthruster. On the last Tidewater boat this was a Wesmar 24-in. dual-prop counter rotating model. Like the other builders, he explains that increasing the size of the boats has added tremendously to the weight and hence the power requirements. A 135 x 28-ft. (41.1 x 8.5 m) boat will weigh 107 long tons light and 346 long tons loaded. A 155 x 30-ft. (47.2 x 9.1 m) boat weighs more like 153 long tons light and 505 loaded. The cargo capacity of the 90 x 25-ft. (27.4 x 7.6 m) aft deck is 250 tons. With these kind of exponential



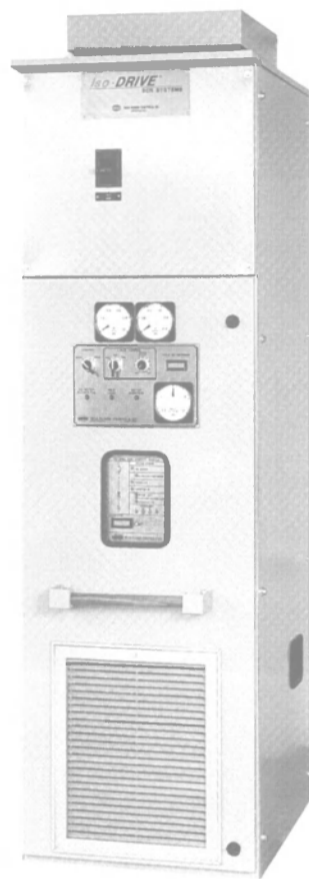
Steve Mouton fairs a crew boat hull at Gulfcraft in Patterson, La.

increases being calculated in the design programs and proving them in practice, the need for big reliable power is paramount. Add to this the challenges of the new IMO emission regulations and cost considerations, there are very few engines that can meet the demands.

Builders along the Gulf of Mexico have noted with interest, the recent

delivery to Mexican owners of two 151 x 29-ft. (46 x 8.8 m) crew boats from the Damen yard in the Netherlands. While these are also Cummins powered, the European builders have chosen to mix two Cummins KTA19 M4 engines with two Cummins KTA38 M2s for a total of 4,100 hp. The European boats will feed the ongoing discussions on design, hp,

and prop versus jet debates, which go on among operators, builders and engine suppliers. Collectively, the crew boat builders and operators around the Gulf represent many years of experience so that these discussions and plans will lead to some of the finest looking, fastest and best load carrying boats being built in the world today.



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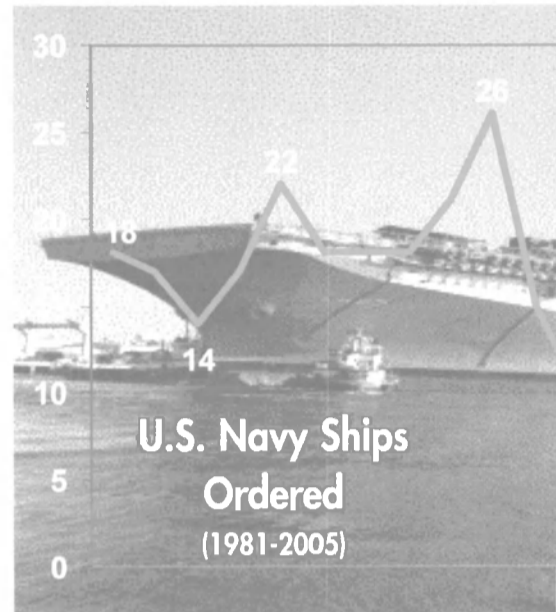
The Big Six

The worst kept secret in the U.S. shipbuilding industry is the need for renewed, elevated levels of naval ship

construction to maintain the fleet at a level, which allows it to meet its worldwide operational strategies. The best-kept secret is exactly what combination of political pressure, world events and market conditions must conspire to achieve this goal.

Ever since the large-scale military

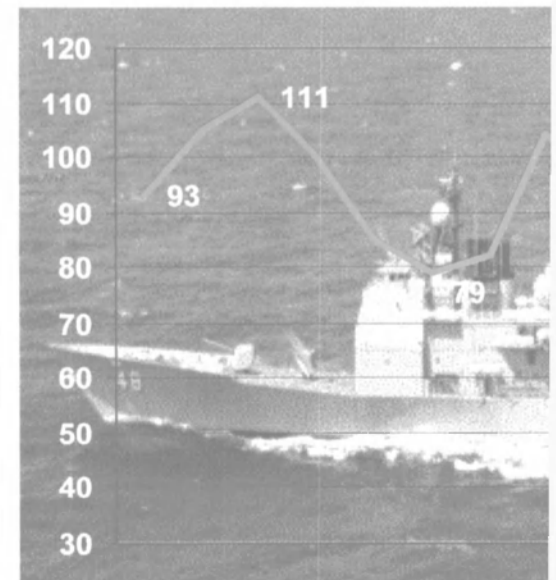
drawdown in the wake of the Cold War, those most closely allied to the big U.S. shipbuilding infrastructure have been lamenting the direction of fleet procurement and naval shipbuilding capability. The market has seen the "Big Six" shipyards of Avondale Industries, Bath Iron Works (BIW), General Dynamics Elec-



tric Boat, Ingalls Shipbuilding, NASSCO and Newport News Shipbuilding by corporate consolidation become the Big Three, with General Dynamics owning Electric Boat, BIW and NASSCO; Litton owning Avondale and Ingalls, and Newport News remaining the sole independent. These companies, through their American Shipbuilder Association, have kept the budget fires burning on Capitol Hill, repeatedly discussing the growing discrepancy between military operational need and fleet capabilities.

At a recent American Sea Power in the 21st Century forum held earlier this year, RADM Al Konetzni, commander of the submarine forces in the Pacific called for a 350 to 360 ship Navy, saying "Real world experiences are reinforcing what those of us in the force providing business have been saying for several years: that a fleet larger than 300 ships is required to satisfy our current and projected war fighting and overseas requirements.

A more realistic requirement for naval forces is one that would be sized at 15 carrier battle groups, 14 amphibious ready groups, 68 attack submarines, 134 surface combatants and supporting ships



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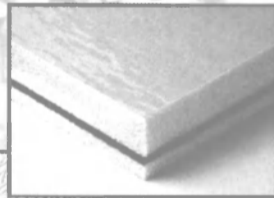
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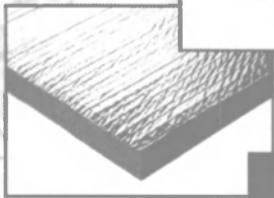
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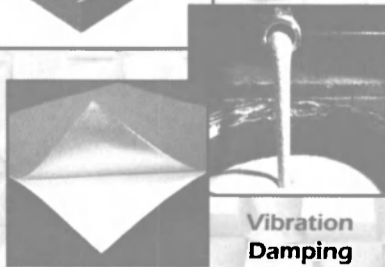
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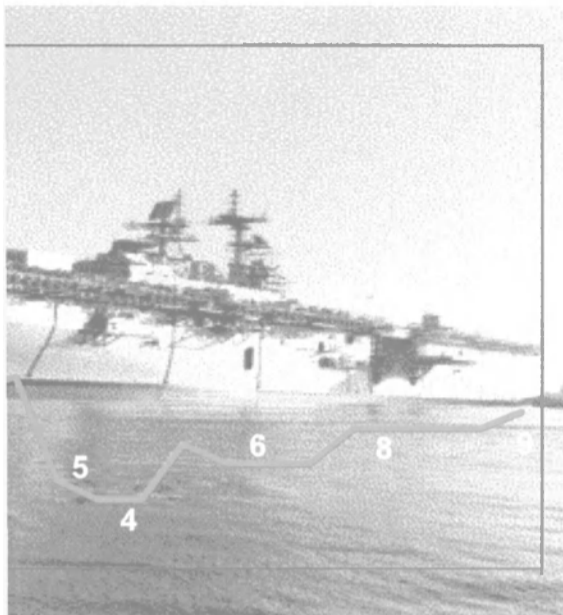


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that more closely approximate a 350 to 360 ship Navy. Yet at the same time we see a future where this gap between reality and requirements may be widening, not shrinking."

To date, the prospects of maintaining RADM Konetzni's vision seems bleak at best, as newbuild levels through 2005 are about eight ships per year, following a low of orders for just four new ships per year during a period in the early 1990s (See Fig. 1); a stark contrast to the 26 orders placed in 1990. As a natural result, the Naval Vessel Orderbook (See Fig. 2) has suffered mightily, dropping from a high of 111 ships in 1983 to 41 at the close of 1998.

Commercial Prospects

While the U.S.' largest yards definitely count a strong U.S. Navy orderbook at the head of its wish list, a steady stream of commercial work integrated with other U.S. government projects would help ensure that the core of the U.S. shipbuilding capability is kept sharp. Pascagoula-based Ingalls Shipbuilding has arguably been the most active member of the small fraternity in bidding and winning work outside of the

naval realm, as it has built an impressive reference list of projects in two technically demanding areas: offshore construction and cruise shipbuilding. The latter is the most important, if not surprising aspect of Ingalls' repertoire, as the U.S. presence in the cruise ship con-

struction realm has been virtually nil for decades. However, the ships being built for United States Lines, while certainly posing a challenge to a shipyard more accustomed to making warships, should benefit from Ingalls' expertise at constructing some of the most complicated

and technically advanced ships in the world. There are two "X" factor in Ingalls' favor; one being the marine equipment manufacturers and two being its strong executive and support team. The marine equipment business has become more consolidated and compet-

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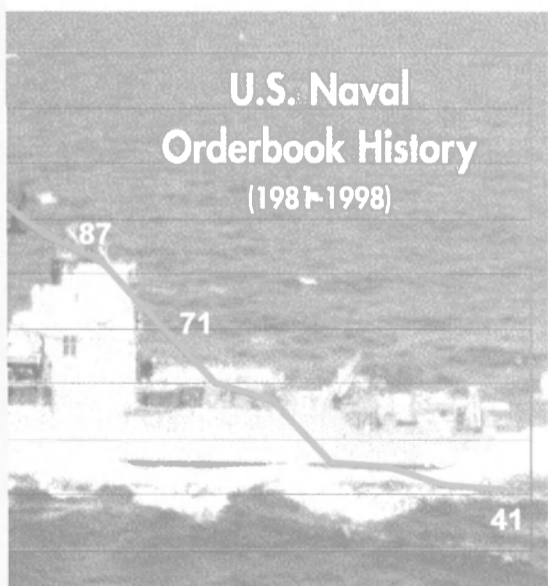
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THE WORLD YEARBOOK

itive than ever, and to say competition is more intense in one instance than another is not wholly correct. However, there is a certain fervor of product and system suppliers to be represented on these historic ships, leaving at Ingalls' disposal a breadth of products and systems, as well as the technical expertise to make the first ship proceed as smoothly as possible.

On the personnel front, United States Lines has at its disposal one of the premier talents in the cruise industry in the last 25 years in **Rod McLeod** (see related story, page 33), as well as the talent pool of Ocean Development Corp., headed by **Jon Rusten**, who has made a career of coordinating the construction of outstanding cruise ships, including the Disney Magic and Wonder.

The Lone Wolf

Newport News Shipbuilding is unique in many ways, with unmatched size of facilities and capabilities, as well as the fact that it is the last "solo" big U.S. shipbuilders. NNS has forged a strong bottom line despite the paucity of naval shipbuilding orders. The shipbuilder, the only U.S. yard capable of constructing the nuclear aircraft carriers, still depends on these \$5 billion ships and its nuclear submarine capabilities to sustain itself, but it has strengthened its core by divesting from traditional shipbuilding endeavors.

Newport News Shipbuilding recently reported net earnings of \$21 million for

the first quarter of 2000.

"This was an impressive quarter for Newport News," commented chairman and CEO **William P. Fricks**. "We delivered significant earnings gains and generated exceptional free cash flow. Moreover, our future programs are receiving broad support in the Pentagon and the Congress. The combination of our consistent and strengthening financial performance on existing contracts, and the revenue and earnings potential provided by future programs, puts us on track for an outstanding year."

NNS' IQ results were significantly buoyed by the activities surrounding work on the next aircraft carrier, CVN 77. NNS posted first quarter revenues of \$469 million versus \$430 million in the same period in 1999. This revenue growth was attributable to gains in the Construction and Engineering segments.

Construction revenues improved \$25 million to \$206 million as a result of advance planning work on the next aircraft carrier (CVN 77), and increased activity on the Virginia-class submarine program. Engineering revenues of \$68 million advanced \$27 million largely due to development work on the propulsion plant for the next generation of aircraft carriers. While revenues in the Construction and Engineering segments exhibited growth, the Fleet Services segment revenues of \$192 million were slightly lower than last year because of the reallocation of resources to construction programs as the refueling and overhaul of the carrier Nimitz enters its final stages. Also during the quarter, the Navy awarded a contract modification valued at approximately \$200 million for the advance planning and procurement for the complex refueling and overhaul of the aircraft carrier Dwight D. Eisenhower, increasing the total value of that contract to more than \$400 million. Eisenhower is scheduled to arrive mid-2001 and will be the second Nimitz-class aircraft carrier to be refueled at Newport News.

Lockheed Martin Signs \$20 Million Safeguard Contract

Lockheed Martin Naval Electronics & Surveillance Systems-Syracuse (NE&SS) has agreed with the Prime Ministry Undersecretariat of Maritime Affairs in Turkey to provide a Vessel Traffic Management Information System (VTMIS) for the Istanbul and Canakkale Straits. Following fierce international competition, NE&SS Syracuse was selected in October 1999 as the prime contractor for the project, which includes the management of a \$300,000 grant by the U.S. Trade and Development Agency for training.

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Shipbuilders Discuss Gameplan

Shipbuilding leaders convened in Washington, D.C. recently to discuss the means and methods to propel the U.S. shipbuilding market at the dawn of the new millennium.

By Regina P. Ciardiello,
associate editor

Under the auspices of seeking a candid and creative discussion regarding the country's shipbuilding future, the U.S. Maritime Administration sponsored a seminar on April 5, dubbed, "Marketing Issues and Challenges Facing the U.S. Shipbuilding Industry."

Attended by industry executives from most of the country's premier facilities, the conference was held on Wednesday, April 5, at the Ritz-Carlton Hotel in Pentagon City, Va.

Stressing the pressures of competition from the lucrative Asian shipbuilding powerhouses of Japan, China and Korea, many conference speakers mulled and brainstormed ways that the U.S. shipbuilders could recapture market share.

Setting the tone for the day was Maritime Administrator **Clyde J. Hart, Jr.**, who acknowledged that there is a need to "help others understand the many facets of marketing — both nationally and internationally."

"We need to be brutally honest in enunciating the major marketing issues and challenges facing U.S. shipbuilding industry — diffidence is for diplomats," Hart said.

Hart was not the only industry insider to voice his feeling. The Honorable **Herbert H. Bateman**, who sits on the House of Representatives, summarized what could perhaps be noted as the primary question of the conference's purpose — What is the ultimate marketing challenge for U.S. Shipbuilding? The answer, according to Bateman, lies within none other than the American people, who need to gain a better understanding of U.S. shipbuilding and how it affects the state of the nation. Citing Title XI as "a crucial move for shipowners to secure commercial financing," Bateman added that certain vessels wouldn't have been built if Title XI, which grants a firm foundation, did not exist.

While some may find both the Jones and Passenger Vessel Services Acts as mere inconveniences, Bateman, who plans to retire later this year from his post, emphatically disagrees. He feels that vessels wouldn't be flying U.S. flags if it weren't for these laws.

Shedding some light on the conference's focus from an international perspective was **Cato Sverdrup**, COO,

Atlantic Marine Holding Company. Sverdrup, who previously was the CEO of Burmeister & Wain, said that while

Korean shipbuilding is impressive in terms of its order book, it doesn't have any firmly planted marketing plan. "Anyone can be competitive," Sverdrup said. "You just have to adjust your prices."

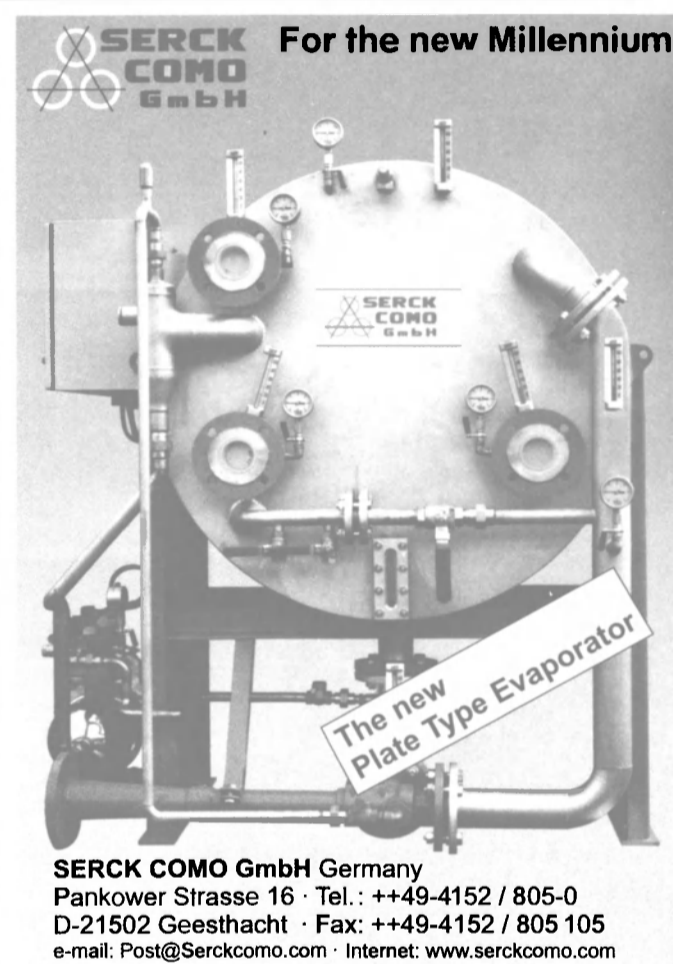
Despite Japan's recent run of success, the U.S. can also take cues from the



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THE WORLD YEARBOOK • U.S. SHIP REPAIR REPORT


Japanese shipbuilding industry of the 1950s, which was filled with yards that were literally in a state of ruin. Key to the Japanese comeback —

aside of from generous government subsidies and a home market with a voracious appetite for local built ships — was the evolution of the industry in a vertical fashion which included the support and supply of all ships equipment from the homeland. A majority of conference attendees addressed that lack of readily available supply lists from U.S. builders could be a cause for concern among owners/operators.

tant to call upon American yards because of this regulation. While not blaming this dilemma solely on the Jones Act, McAlear cited that taking a big picture look of the industry, as a whole would prove favorable, as well as working together. "It seems everyone has their own agenda," McAlear said. "If we want to improve our position, it needs to be a cohesive action."

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Proactive Methods of Change

If these components of improvement come even close to being resolved, U.S. shipbuilders must join together as one multi-tasked group if changes are going to be undertaken.

According to **Ronald J. McAlear**, vice president, operations Litton Avondale Industries, "the defense of the free world depends on the U.S. maritime industry," we need to be proactive in recognizing our weaknesses and be willing to change. McAlear stressed that a commitment and understanding between builder and owner is key, especially getting to know customers and developing beneficial relationships.

Unlike Bateman, McAlear believes that the Jones Act poses a problem for U.S. builders.

He feels that many owners are reluc-

Litton Outfits LNG Carrier

Litton Marine Systems has supplied a complete integrated bridge system to Bonny Gas Transport for installation on an LNG carrier, which has since been placed back into service following long-term layup.

Fitted on the 74,000-dwt LNG Lagos at the Sobrena Shipyard in Brest, the Litton installation boasts interswitched BridgeMaster E X-band and S-band ARPA radars and a dual Voyage Management System (VMS) with ECDIS utilizing British Admiralty ARCS electronic charts.

The turnkey contract encompasses the design, manufacture and installation of a new main navigation console, which was completed in a record time of 14 weeks from order.

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Maritime Reporter/Engineering News

Hornbeck-Leevac Announces Significant Expansion Of Its OSV Fleet

Hornbeck-Leevac Marine Services, Inc. has announced that its wholly owned subsidiary, Hornbeck Offshore Services, Inc., has begun a new vessel construction program to significantly increase the size of its seven-vessel, state-of-the-art offshore supply vessel (OSV) fleet. A contract has been signed with Leevac Shipyards to immediately begin construction of two ultra deepwater vessels with four to follow. The first vessel is expected to be delivered in February 2001. All vessels are expected to be completed within the next 20 months.

During his presentation to shareholders, **Christian Vaccari**, Hornbeck-Leevac's CEO said "When we first began construction of our fleet of OSVs in late 1997, we were committed to building a "new breed" of OSVs that would exceed the requirements of our offshore customers." Hornbeck Offshore Services currently operates a fleet of seven recently constructed, high capacity OSVs. The new ultra deepwater vessels announced today will incorporate the highly successful design features and specifications of the current deepwater fleet. These state-of-the-art vessels were specially designed to maximize available deck space and supply capacities while minimizing operating costs through increased operating efficiencies. **Todd Hornbeck**, President of Horn-

beck-Leevac commented, "We are very pleased with the continuing positive response we have received from our customers on our fleet. In anticipation of

the growing needs of the ultra deepwater offshore industry over the next several years and the strong demand from our clients to increase the number of Horn-

beck-designed vessels that can be made available for long-term contracts, we are very proud to embark on this exciting expansion program."



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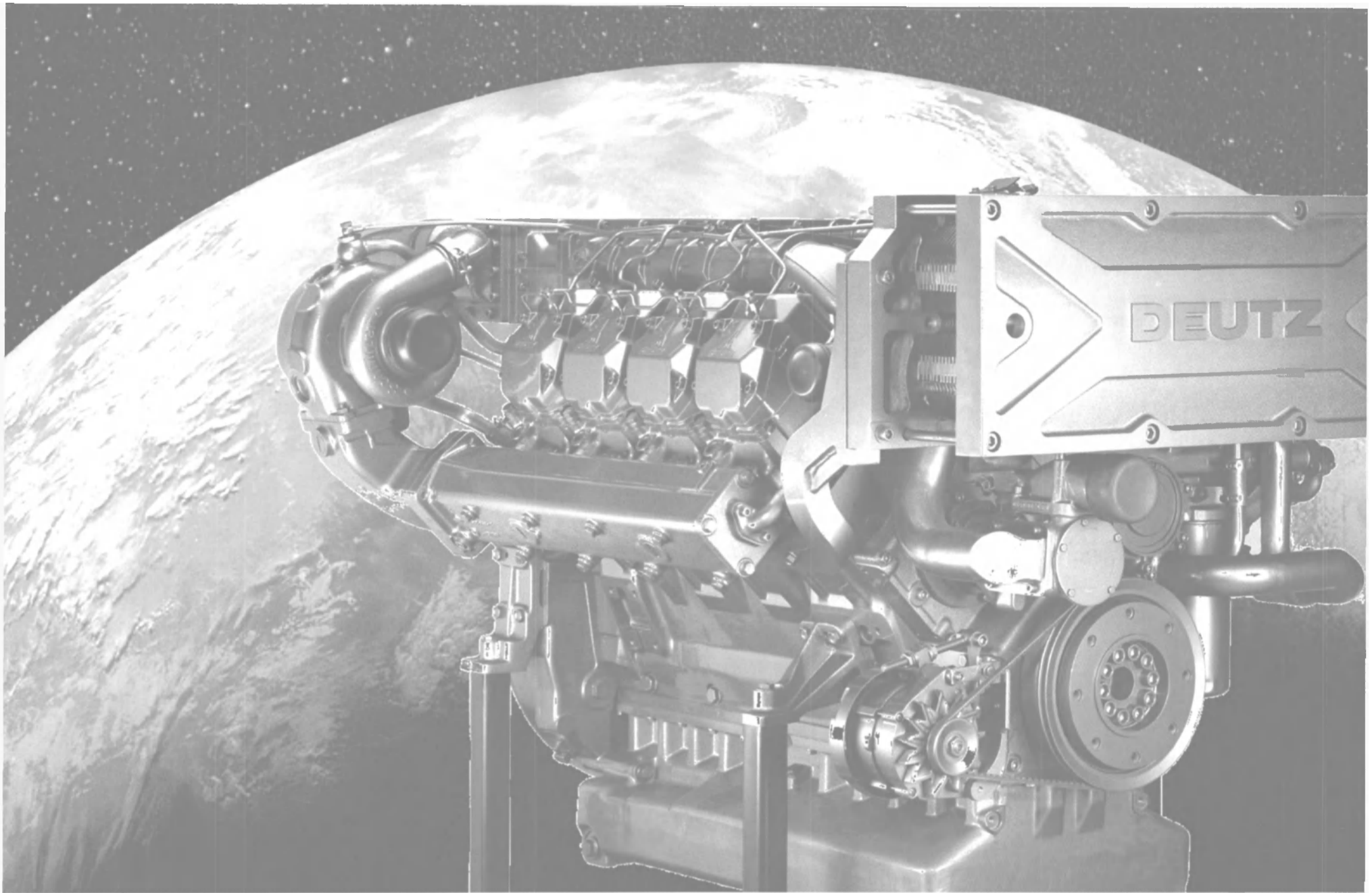
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Configuration	in-line	in-line	in-line	in-line
No. of cylinders	4	6	6	6
Bore/stroke	mm 108/130	108/130	108/130	108/130
Displacement	l 4.76	7.15	7.15	7.15
Power ratings 1)	kW 81-118*	123-145*	148-174*	166-195*
at speed	min-1 2300	2300	2300	2300
Continuous power 2)	kW 81-105	122-128	146-155	-
at speed	min-1 1500/1800	1500/1800	1500/1800	-
Weight 3)	kg 600/650	750	800	800
Weight 4)	kg 500/550	650	700	700
Dimensions	mm 1050x850x910	1420x850x910	1420x850x910	1420x850x910

1015 Series

Engine type	BF6M1015	BF6M1015C	BF8M1015C
Configuration	V-engine	V-engine	V-engine
No. of cylinders	6	6	8
Bore/stroke	mm 132/145	132/145	132/145
Displacement	l 11.91	11.91	15.87
Power ratings 1)	kW 214-240*	261-425*	348-560*
at speed	min-1 2100	2100-2300	2100-2300
Continuous power 2)	kW 210-228	285-310	380-413
at speed	min-1 1500/1800	1500/1800	1500/1800
Weight 3)	kg 1300	1400	1800
Weight 4)	kg 880	950	1250
Dimensions (L x W x H)	mm 1205x1305x1021	1480x1305x1021	1673x1305x1021

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2) For on-board generating sets.

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DNV:

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1 In extending its adherence to delivering cost-efficient and safety driven technologies, DNV has introduced a new means of quickly and accurately determining steel thickness can speed ship surveys. It is especially valuable in inspecting old and corroded steelwork. Present-day methods, based on ultrasonic thickness measurements, are said to have dubious reliability on heavily corroded plates, and for large vessels are also considered too slow. The basic technological challenge was to transmit 100 percent of the signal energy through corroded steel plates, and receive and interpret the reflected signal to give an accurate thickness measurement. The basic principles of the new measuring method (half-wave resonance) have been known for 40 years. But their application was not technically feasible until recently due to lack of data power and limited transmitter technology. A novel method for analyzing acoustic frequency spectra has been developed jointly by DNV and the Nor-

wegian industrial group Kongsberg Defense & Aerospace through an exclusive cooperation agreement.

The measuring method has extreme accuracy in both air and water. The mean strength thickness is processed over a chosen area, providing for further analysis and planning. No removal of

scaling and other corrosion products is required, nor of marine growth. On-line digital registration and processing of inspection data is incorporated. The new technology in part, is designed to revolutionize steel-thickness measurements of corroded surfaces

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**Jotun Sea Quantum:
Tin Free Coating Coverage**

2 Bringing its first cargo to Europe following completion by Samsung Heavy Industries, the 306,000-dwt



British Pioneer has given new expression to environmental-consciousness in the crude oil transportation sector. The ship's potential impact on marine life has been lessened through the adoption of a newly unveiled, tin-free antifouling. Jotun's SeaQuantum product is claimed to stand shoulder-to-shoulder performance-wise with the tin-bearing self-polishing paints, which have enabled shipowners to operate at drydocking intervals of up to 60 months. While Jotun developed the formulation for the coating, Japanese chemicals group Nippon Oil and Fats (NOF) came up with a silyl polymer to replace the environmentally hazardous tin compounds used in the ubiquitous self-polishing antifouling coatings. Multiple full-ship pilot applications over the past seven years provide Jotun with the basis for its claims for the long-run potency and also enhanced fuel-saving effect of the system. British Pioneer, first of a quartet for BP Amoco Shipping, is one of a host of newbuilds to be treated with the copper-based underwater coating.

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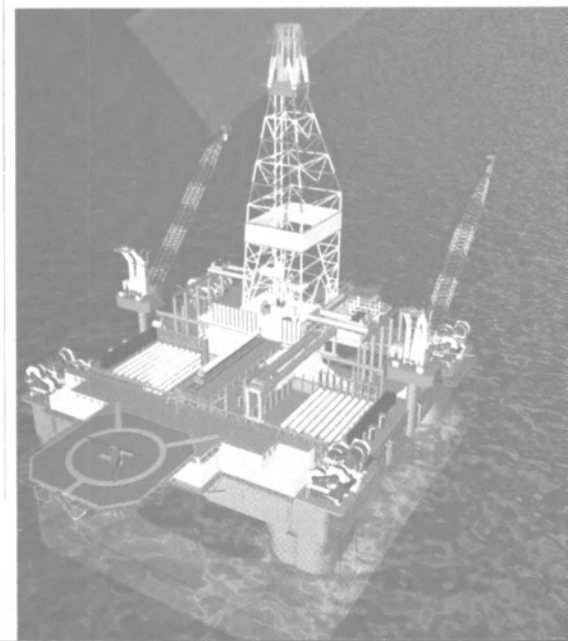
Discovery Deep Seas

3 The last in the series of three Ultra Deep Water (10,000 ft.) Dynamic Position Drilling Units — Discovery Deep Seas — built by Astilleros Espanoles' Astano yard in Ferrol was completed last month and heading to the U.S. for final outfitting. The 834-ft. (254.4-m) vessel series successfully embodies myriad shipbuilding and offshore technology innovations, and stands as a powerful reminder of the engineering expertise and quality construction offered by Astano. As of early May, Discovery Deep Seas had been slipped down the delivery ways at the Astano yard and taken position at neighboring Bazan — to take advantage of the yard's deeper draft availability — for final fitting of the six Aquamaster thrusters. For additional information on the technical specifications and achievements by Astano regarding the Discovery drilling unit series, please see related story on page 7 of this edition.

Exmar Offshore Co.:

Patented Semisubmersible

7 With the world offshore market roaring back to life and an estimated \$800 million to \$1.9 billion to be spent on semisubmersible units over the next five years, Exmar Offshore is nicely positioned to prosper with a patented system. Exmar Offshore earlier this year received a U.S. Patent (#6,015,245) on its semisubmersible hull form, its ring pontoon semisubmersible. The hull form has been the basis of Exmar's series of semisub designs for drilling and floating produc-



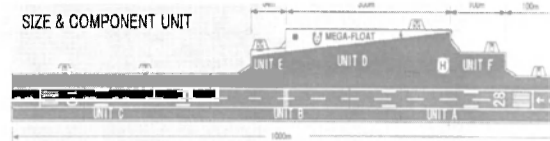
THE WORLD YEARBOOK • MARINE INNOVATIONS

Mega-Float: Project Takes World Record

5 The Japanese-built Mega-Float was officially recognized by Guinness World Records Ltd. as the largest man-made floating island. The structure measures 3,280 x 397 ft.

(1000 x 121 m) and is 10 ft. (3 m) deep, and was opened to the public on August 10, 1999 at Yokosuka Port, Tokyo Bay, Tokyo. R&D on the structure was initiated in 1995, supported by the Japanese Ministry of Transport and Nippon Foundation. The aim of the joint shipbuilding/steel industry project: meet demand

for utilization of ocean space and supplementing conventional landfill methods. From the beginning of June to the end of October 2000, Mega-Float is scheduled to be used for take-off and landing experiments to demonstrate



tion applications, the Exmar 2500 and Exmar II design series. The configuration is designed to allow for significant motion characteristics improvement, while reducing current drag. The hull configuration is also characterized by its inherent structural efficiency and ease of construction. There are two design series based on the patent, the four-column Exmar II and the six-column Exmar 2500 semi-submersibles. The main feature of the hulls is the "ring" pontoon configu-

ration. It provides significant reduction of current drag when compared with conventional semi-submersibles with two parallel pontoons. The Exmar patent consist on the proper position of the pontoons with respect to the columns, which allows for cancellation of hydrodynamic forces in waves, thus providing for better motions in waves. Note picture with the yellow hull form. This hull shape takes full benefit of the Exmar patent so that motions reductions in waves are significant.

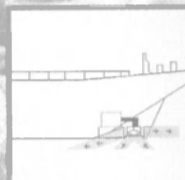
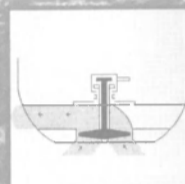
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Ellicott Leads Dredging in the 20th Century

When World Dredging Mining & Construction named its top 10 technical innovations of the 20th century together with the top 10 marine dredging projects, the Ellicott name was omnipresent for its role in three of the 10 technical innovations: Development of the cutter suction dredge; Development of the portable dredge by Mud Cat; Development of the bucket-wheel suction dredge. No other manufacturer or designer was cited for as many technical innovations as Ellicott. Of the 10 largest dredging projects, Ellicott equipment was used in more than half, including the industrial land reclamation in Japan and the construction and expansion of the Panama Canal.



The most powerful dredge when originally built.

Kvaerner Masa-Yards: Voyager of the Seas

While it may not hold its title as world's largest for long, the Kvaerner Masa-Yards-built and Royal Caribbean-owned Voyager of the Seas cruise ship is an innovative marine structure in every sense of the word. The gargantuan ship — able to carry a maximum of 3,840 passengers and 1,180 crew — has cut a figure of unprecedented scale in the passenger ship sector. At 137,200-gt the cruise ship offers a towering superstructure and an air draft of 208-ft. (63.5-m), with a draft of just over 28-ft. (8.8-m). The achievement comes with an equally sizable price. Although the shipbuilding price from KMY was around \$500m RCL estimates that its overall project expenditure in bringing it to the market was closer to \$700m.



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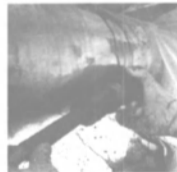
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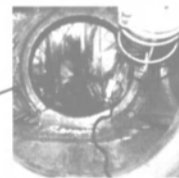
Stitching restores a hard to replace pump manifold.



Plating a worn lifting cylinder on an ore carrier.



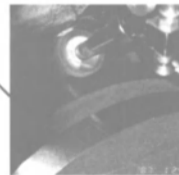
Stitching approximately 100 in. of crack on a ship's propeller hub.



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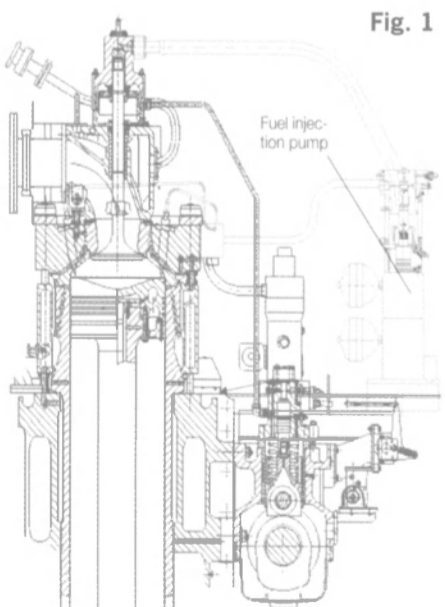
**MAN B&W:
Intelligent Engine**

8 MAN B&W has been at the forefront of diesel engine development since its inception more than a century ago. The organization, which boasts one of the stronger R&D reputations in this and general power markets, has continuously developed and delivered to market a broad spectrum of propulsion innovations with an eye on fuel efficiency, emission reduction and reduction of life-cycle costs.

The Intelligent Engine is the latest development, a computer-controlled low speed crosshead engine. The basic goal of the development is to reduce the cost of operating the engine and to provide a high degree of flexibility in terms of its operating modes. While the use of electronic systems within the primary propulsion environment has not been traditionally embraced by the maritime market, the need for flexibility to cope with diversified emission limits and increasing demands for reliability will undoubtedly raise the acceptance level. The three major areas of concern involve:

- Enhanced engine reliability, including on-line monitoring to ensure uniform load distribution among cylinders and significantly improved low load operation;
- Enhanced emission control flexibility, including emission performance characteristics optimized to meet local demands and the ability to update at a later date; and
- Reduced fuel and lube oil consumption, including optimizing engine performance fuel at all load conditions and ensuring "as new" performance over the engine lifetime.

Development of the IE is now in phase three, and the IE concept is demonstrated in full scale on the chemical carrier M/T Bow Cecil, built at Kvaerner Floro Yard in Norway for Norwegian owner



Odfjell ASA. The main engine of the vessel is a 6L60MC, which was prepared for the IE system during production. Figure 1 shows how the IE systems are installed on the upper gallery of the engine, in parallel with the conventional camshaft. With this set-up, it is possible to change over completely from the conventional system to the IE system or

vice versa within about three hours.

The first commercial reference for the Intelligent Engines will be found aboard two trend-setting V-Max 314,500-dwt shallow draft VLCCs (figure 2) being built at Hyundai for Concordia Maritime. Each ship will have a pair of 7S60ME-C engines, and the first vessel is scheduled for delivery in March 2001.



Fig. 2

Besides the mechatronics drive for the fuel injection system and exhaust valve actuation, the engines will have a computer controlled starting air system and new computer controlled cylinder lubricators, ensuring low cylinder lube oil consumption.

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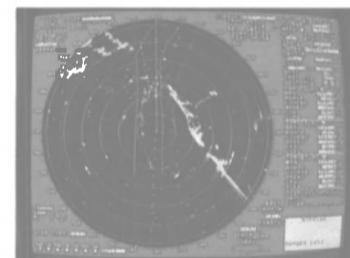
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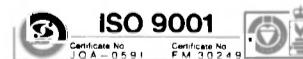


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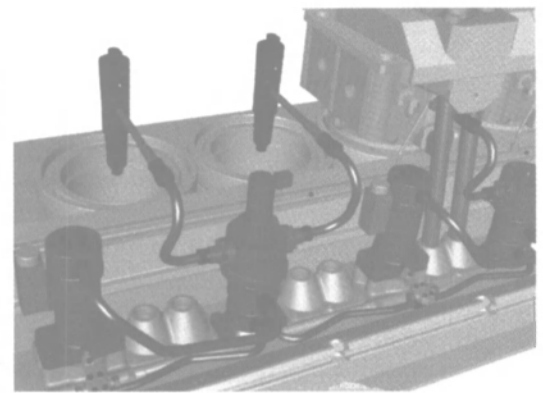
Wärtsilä NSD: Starts Work On Smokeless Diesel Engine

9 Wärtsilä NSD has combined resources with Carnival Corp. to develop a smokeless diesel-electric propulsion system for cruise ships. The bold move, hardly a surprise given

the Finnish engine maker's penchant for developing and delivering next generation technological innovations in the fiercely competitive marine diesel engine realm, gives a clear indication as to the effects of environmental concerns to the daily operation of marine companies. Code-named "project enviro-engine," prototypes of the new engine are expected to be available later this

year for laboratory testing and are expected to be available commercially in 2001.

In line with this announcement, the engine maker announced that **Daniel Paro** BSc (Eng.), who has headed Research & Development for many years, will take responsibility from a technology standpoint for the launch of Wärtsilä NSD's new-generation smoke-



The Wärtsilä common rail system located in the hot box comprises pressurizing pumps and fuel accumulators, a layout designed to eliminate risks of fuel pressure waves in the system.

Marine Pilot Simulator Based Performance Training and Evaluation System

When the State of Alaska wanted someone to develop a program to periodically evaluate state marine pilots on a full mission bridge simulator, they chose STAR Center, the world's leader in training, assessment, and evaluation of maritime professionals.

STAR Center conducted a year long Job Task Analysis of pilot duties and performance criteria. This was followed by development of an extensive geographic visual database of Alaskan ports and pilotage waters that



were verified by the individual marine pilot associations. The end result is a one-of-a-kind program for marine pilots that provides evaluation, standardization, and above all, an internationally recognized marine pilot continuing professional development program of training assessment.

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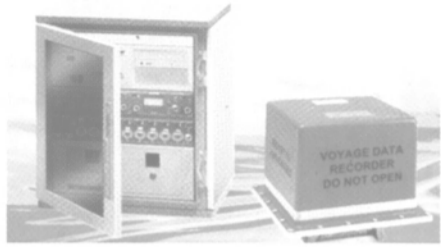
Circle 309 on Reader Service Card

less engines. Summarily, Prof. **Matti Kleimola**, Lic.Tech. has been appointed group vice president, Technology and a member of Wärtsilä NSD's Board of Management, effective July 15.

Following successful completion of testing, Carnival plans to utilize those engines on its future newbuilds. According to Captain **Jim Drager**, Carnival's vice president of corporate shipbuilding, when complete, the enviroengine, installed in a diesel-electric propulsion system, will be one of the most environmentally friendly power plants available for ships. "We have studied the attributes of gas turbines, which we are considering installing on several Carnival Corp. newbuilds now under contract, but still believe that eventually our current diesel-electric systems can be as environmentally friendly as gas turbine alternatives," he said. Drager pointed out that because of efficiency, diesel-electric systems are far less taxing on precious fossil fuel assets and also emit substantially less carbon dioxide to the atmosphere, which is the number one contributor to global warming. According to Paro, the enviroengine is being created by combining "common rail technology" with a direct water injection system. Common rail technology uses an electronically controlled method to inject the precise amount of fuel at exactly the right time, resulting in greater engine operating efficiency and virtually eliminating smoke emissions. Direct water injection reduces nitrous oxide emissions by spraying water into the combustion chamber to cool it down immediately prior to injecting the fuel. Cooling down the chamber reduces nitrous oxide formation, which occurs at high temperatures. This method reduces nitrous oxide emission value to the same level as gas turbine engines. Paro said, "Since the mid-1980s, Wärtsilä NSD has spent more than \$100 million (U.S.) on emission reduction research." He added that Wärtsilä will have spent more than \$10 million (U.S.) on the enviroengine development before the prototype testing models are even built.

Circle 102 on Reader Service Card

Litton Unveils Innovative Voyage Data Recorder



Litton Marine Systems has developed a next-generation voyage data recorder (VDR) system designed to comply with the emerging IMO carriage requirements for black boxes on passenger ships and other vessels.

According to **Thomas A. King**, strategic business unit director for information technology, Litton's VDR system has been created to meet or exceed the requirements of IMO A.861.20 and EC Directive 1999/35/EC. The hardened data capsule is compliant with IEC requirements, including fire and immersion tests. King added that initial versions of the Litton VDR have already been implemented on more than 25 vessels, including tankers, containerships and cruise ships. Recent installations include Royal Caribbean's *Voyager of the Seas*, as well as the three U.S. Lines vessels for American Classic Voyages.

Circle 23 on Reader Service Card

Pruftechnik Shakes Up Machine Monitoring Market

The latest creation from Pruftechnik is the vibscanner, which takes regular measurements in series by graphically showing measurement locations in succession. Joined together with the patented vibcode transducer system and encoded measurement locations, this



Vibscanner "machine scanning" via joystick trending data collection even for non specialists. Built into the system are useful sensors for intricate machine parameters, such as vibration acceleration, displacement and velocity according to the new ISO 10816-3 standard, as well as bearing condition, temperature and rpm. Additional process parameters can be metered through 4-20mA analog signal input, or can just be entered manually. A built-in electronic notebook allows the maintenance technician to record standard observations, (e.g.); "oil leak," and four LEDs located above the display indicate measured machine condition on the spot.

Circle 24 on Reader Service Card

Cutler Hammer Receives U.S. Navy Contract

Cutler-Hammer's Navy Controls Division was granted a contract for the U.S. Navy's Trident Workstation Program. The contract calls for the provision of 20.1-in. Active Matrix Liquid Crystal Display (AMLCD) Flat Panels valued at \$1.2 million. These displays will offer the man-machine interface for workstations on the Trident class of submarines.

Manufacturing will commence immediately at Cutler Hammer's ISO 9001 certified facility in Danbury, Conn. The displays have already been fully qualified by the Naval Surface Warfare Center (NSWC) in Crane, Ind., and approved by the Department of the Navy Strategic Systems Directorate in Washington, D.C. for use on this program.

Circle 25 on Reader Service Card



Cutler-Hammer's Flat Panel.

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Ship Repair & Conversion

Hydrex Responds To The Call

Hydrex responded to a midnight emergency call for repairing a shell plating crack in the tank of a 39,043-ton bulk carrier, which was carried out in enough time to allow the vessel to continue on schedule — fully operational.

The initial problem reported to Hydrex

involved a crack that had been discovered in the shell plating of the double bottom tank. The crack, which had been provisionally repaired by a local company, needed the attention of permanent repair to keep it on schedule and out of drydocking.

One key component involved the fab-

rication of a cofferdam, which was necessary for the crack repair — this was constructed while the Hydrex team was in transit to Singapore.

Immersing themselves within the task at hand, the team removed a temporary doubler covering the crack, to allow a section of the cracked hull plating to be

removed and subsequently replaced with a new insert plate.

Circle 67 on Reader Service Card

Harbor Princess Stops At Bay Ship

Red & White Fleet's ferry Harbor Princess underwent Coast Guard annual inspection, re-engining and a variety of other repairs and ADA upgrades at Bay Ship's Alameda, Calif. shipyard and drydock facility.

The majority of the vessel's work included replacement of both main drive engines, fabrication of new main engine exhaust piping and installation of cooling systems for engine cooler circuits.

Harbor Princess also received cleaning, preparation and painting, which was completed in areas such as: hull, waterline to sponson including lettering and numbering, weather deck and ADA accessible head.

Circle 66 on Reader Service Card

Celebrity Horizon Undergoes Repairs At NNS



Celebrity Cruise Lines' Horizon

Newport News Shipbuilding (NNS) welcomed the arrival of Celebrity Cruise Lines' Horizon on April 21 for drydocking and repair work.

In service since 1992, the 46,811-ton, 670 x 94 ft. (204.2 x 28.6 m) vessel underwent hull painting, survey for the propulsion system, sea valves, thrusters, stabilizers and electric cells.

Circle 65 on Reader Service Card

Rehabilitation By Hydrodemolition

The rehabilitation of the Lisnave Drydock in Portugal was a world premiere event — it was the first time that hydrodemolition was applied to this type of reinforced concrete structure.

The job entailed the removal and replacement of heavily deteriorated concrete from the walls, floors and galleries of the drydock, as well as the surrounding facilities, quay and wharves. The height of the walls varied from 13 to 15 m, and the concrete had to be selectively removed up to a depth between 12 and 14 cm, including the exposure of the

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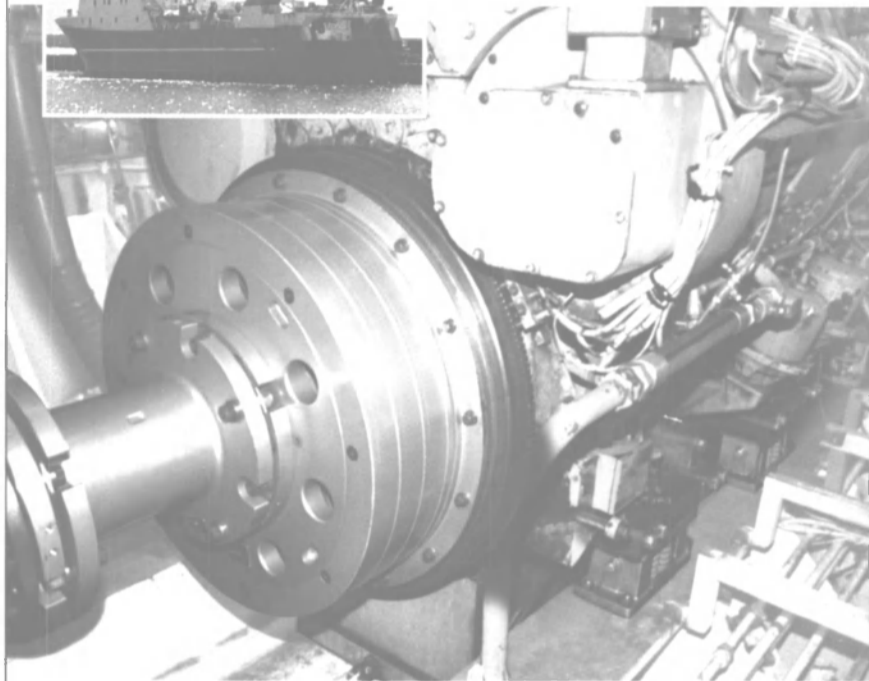
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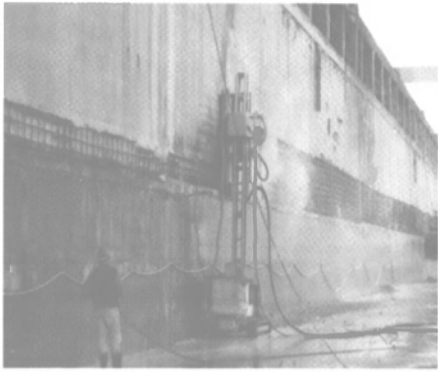


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rebars on the total area of 6,000 sq. m vertical surface.

Demolition work was completed by local contractors using a hydrodemolition robot Aqua cutter HVD-6000 powered by a high pressure unit PP-480, which is driven by a high pressure plunger pump WOMA 480 Z. In central-head-design, this plunger pump is able to deliver a volumetric flow rate of 193 l/min, generating a corresponding water pressure of 1,000 bar.

Esperanza Completing Trials At Cascade



Photo: © Cascade General

Designed to provide a reliable, electric, power supply to the Guatemala power grid is Esperanza — a 124MW floating power barge constructed by Cascade General. The Portland, Ore. shipyard is conducting trials prior to the vessel's scheduled delivery to Guatemala in May.

The self-contained electrical generating facility is constructed on a 279 x 104 ft. (85 x 31.6 m) deck barge, which will then be transported on a submersible cargo ship.

The barge is the largest diesel-powered, mobile unit ever to be built in the U.S. Kvaerner Masa Marine of Vancouver is the overall designer, and the prime contractor is MAN B&W.

Powered by seven MAN B&W V-18 engines each weighing 330 tons and producing 25,000-hp, coupled to seven Siemens 13.8kV generators, with a total output of 124 MW.

The power barge is owned by PQP Limited, a joint venture between Enron and Centrans Energy Services, and a consortium of Guatemalan and foreign investors that develops and operates

projects in Central America and the Caribbean.

Circle 22 on Reader Service Card

North America Is Leader Of Cruise Ship Repair Market

According to the San Diego-based consulting firm Stellar Carson Associ-

ates, LLC, more than one-third of the \$1 billion global cruise ship repair and conversion market was taken by North American shipyards in 1999.

Of the eight U.S. yards examined in the study, two are associate members of the International Council of Cruise Lines (ICCL) — Atlantic Marine and Cascade General.

The study, which is known as "1999 Global Cruise Ship Conversion and Repair Market," said that "United States yards are now trusted with scheduled dockings, and are preferred providers for ships home-ported in North America — a significant shift from a decade ago."

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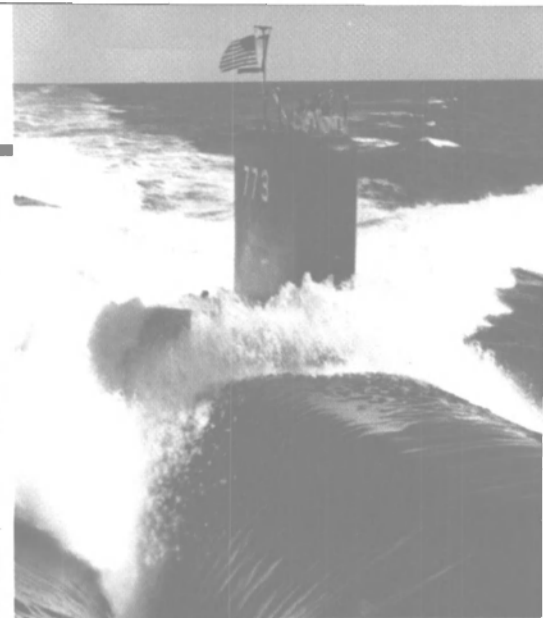
New Book Examines Undersea Combat

This year the U.S. Navy celebrates its submarine centennial. On April 11, 1900, the first USN submarine was purchased in Groton, Conn., from the company that would later be known as Elec-

tric Boat.

In the past quarter-century, the range of submarine weapons moved from a few hundred meters to a few thousand miles, while warheads evolved from a

quarter-ton of explosives to megatons of nuclear firepower. What lies ahead in the next century of undersea combat is the subject of a new book by **Stan Zimmerman**, *Submarine Technology for the 21st*



Century. Zimmerman spent a decade as a naval correspondent based in Washington, D.C., and was on assignment worldwide on the submarine beat. What he found makes for eye-opening reading, especially for Americans unaware of submarine advances elsewhere in the world. Other books have focused on submarine history recently, such as **Clay Blair's** two-volume, *Hitler's U-Boat War*; and **Sontag and Drew's** expose of the Cold War, *Blind Man's Bluff*. Zimmerman's book looks at the fruits of current research in laboratories worldwide.

Submarines are the original stealth platform. As the German U-boats and American pig boats of World War II proved, any nation dependant on international trade may become hostage to submarines. As American dependence on foreign goods and resources continues to increase, even a handful of hostile submarines can cause havoc.

While the fall of communism took away the threat of a Russian submarine offensive against NATO convoys and fleets, that threat has been replaced by Russian submarine sales worldwide. India, Iran and China are only three of several customers eagerly buying new Russian submarines; the Swedes, French and Germans are active exporters of combat submarines as well.

These exports, equipped with the latest equipment and weapons, would not be easy targets. In the scramble for exports, very sophisticated weapons are for sale in world markets, including the Russian rocket torpedo. The heart of the modern combat system for a submarine will fit in the trunk of a car, and exotic non-nuclear propulsion systems eliminate the need to surface for battery-charging. Despite his arcane subject, Zimmerman makes the material approachable. With clear writing and effective use of tables and diagrams, *Submarine Technology for the 21st Century* makes an important topic understandable.

Submarine Technology for the 21st Century, Stan Zimmerman, Trafford Publications, Victoria, BC, Canada. \$35. ISBN 1-55212-330-8.

Bob Ardren is a journalist living and working in Sarasota, Fla.

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Annual Reports

ABB Turbo Systems

December 1999

marked the end of a demanding financial year for ABB Turbo Systems. The overall market for new turbochargers emerged from a more unpleasant side. In spite of difficult conditions, ABB is pleased that it has been able to maintain revenues for 1999 at the high level of the previous year.

Contributing to the company's steady growth is its new TPL -B turbocharger for two-stroke diesel engines, which was launched in March 1999.

Circle 104 on Reader Service Card

Trico Marine Services

Trico Marine Services owns and operates a diversified fleet of marine support vessels serving the oil and gas industry mainly in the U.S. Gulf of Mexico, the North Sea and Latin America. The company's fleet features technologically driven, multi-purpose anchor handling, towing and supply boats and large platform supply vessels, as well as an advanced SWATH crew vessel. During 1999, Trico launched the innovative Northern Admiral, a 275 ft. multi-purpose anchor-handling, towing and supply vessel in the North Sea.

Circle 105 on Reader Service Card

Tidewater Marine

Tidewater Marine, which is a provider of maritime services to the offshore oil and gas industry, is increasingly becoming an international company. By the end of Fiscal Year 1999, Tidewater and its related companies had operations in approximately 30 countries. Of the almost 700 vessels in the Tidewater Marine fleet, more than 400 operated in areas outside the U.S. The reason behind this fact is that more of the world's oil and gas exploration, development and production are occurring beyond North America.

Circle 106 on Reader Service Card

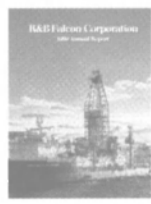
Unitor

Unitor's business was significantly affected last year due to difficult market conditions in most shipping segments. In the last few years, the most important external driver for Unitor's business has been total seaborne trade, which for the first time since the early 1980s, decreased in 1998. As a result, shipowners and managers

focused on cutting expenditures during 1999.

Regarding marine chemicals, the company raised its market share. Under the banner, "Unitor's Change Program," steps were implemented to streamline internal operations.

Circle 107 on Reader Service Card



R&B Falcon Corp.

R&B Falcon Corp. is the result of the 1997 combination of Reading & Bates Corp. and Falcon Drilling Co. and the subsequent acquisition of Cliffs Drilling Company in late 1998. R&B Falcon operates a fleet of 139

marine units including 61 inland marine drilling and workover units, 50 shallow-water units, 23 deepwater drilling and service units and five mobile production units. The company delivered the 10,000-ft. water depth drillship Deepwater Pathfinder in September 1998.

Circle 108 on Reader Service Card

(continued on page 88D)

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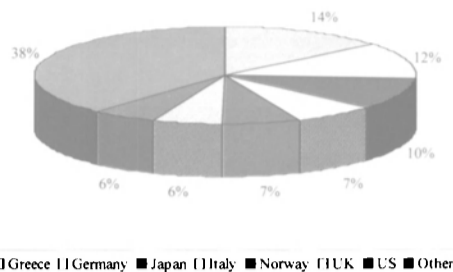
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World Maritime Statistics

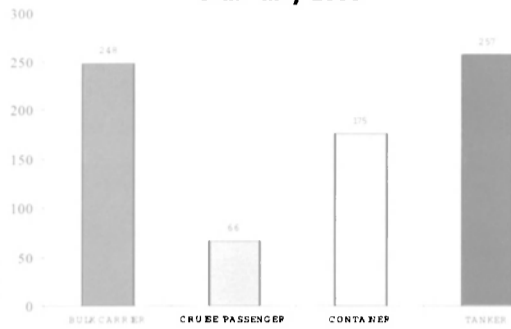
World Shipyard Orderbook

(Source: Forlship)

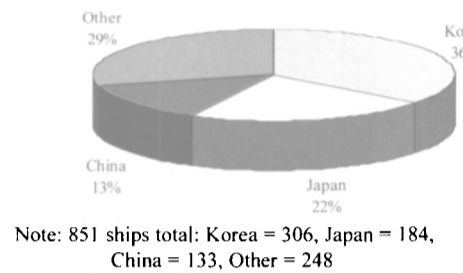
**New Ship Orders by Ship Owning Country
Jan. - May 2000**



**New Ship Orders by Type
Jan. - May 2000**

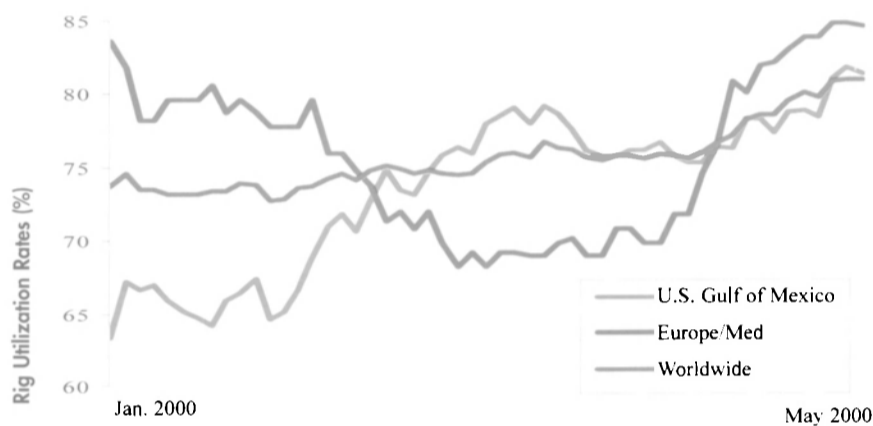


**New Ship Orders by Country of Build
Jan. - May 2000**

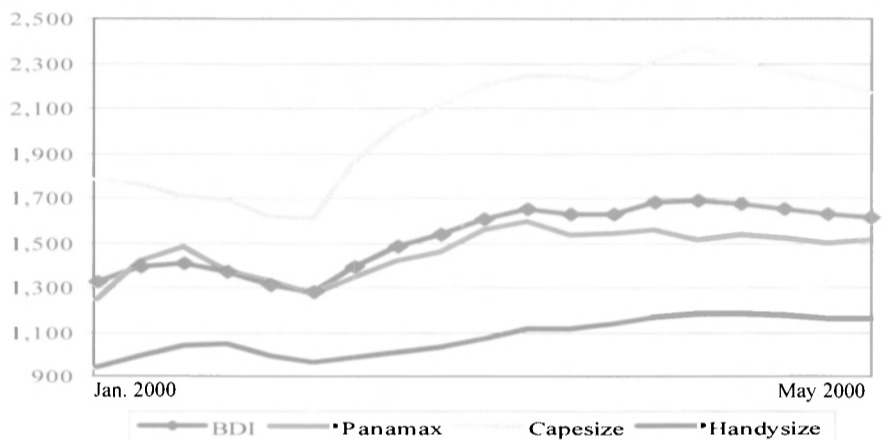


Rig Utilization Rates

(Source: Offshore Data Systems)



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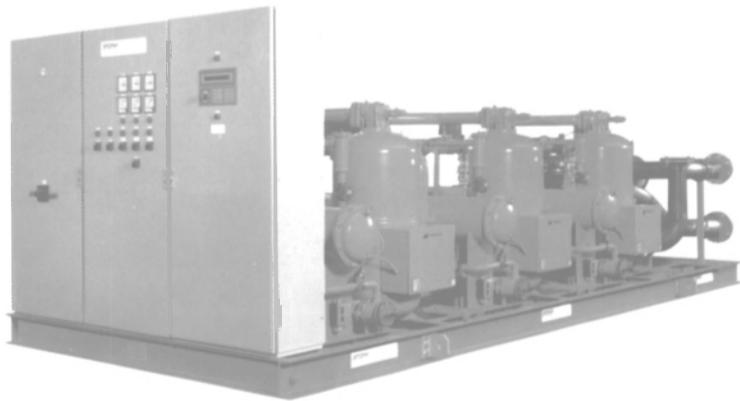
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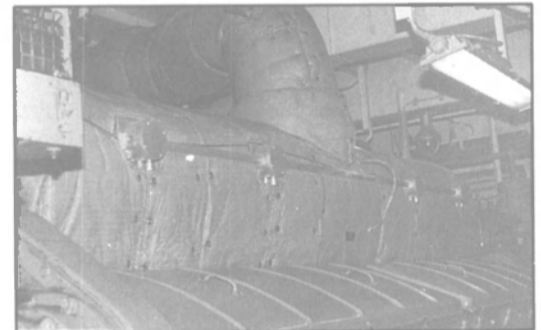
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Annual Reports

(continued from page 88A)

Seacor Smit

In 1999, Seacor Smit achieved revenues of \$289.4 million, while earning \$30.9 million or \$2.54 per share generating \$92 million in EBITDA. The company received delivery of 10 boats, as well as using approximately \$311.9 million of its liquidity for investing and financing activi-

ties. At year-end the company held \$273.5 million in "free" cash and liquid assets. Seacor also increased its investment in Chiles Offshore and Globe Wireless.

Circle 109 on Reader Service Card

Royal Caribbean Cruises, (RCCL)

Royal Caribbean Cruises, Ltd. reported improved net income and earnings per share for the year ended

December 31, 1999. Net income increased 16 percent to \$383.9 million or \$2.06 per share on a diluted basis compared to \$330.8 million or \$1.83 per share in 1998. The



company's fleet expansion continued with the delivery of Voyager of the Seas in November 1999, the first of a trio of Eagle-Class ships to be added to RCCL's fleet

Circle 110 on Reader Service Card

Newport News Shipbuilding

Newport News Shipbuilding reports to its shareholders that its annual revenues

were estimated at \$1.86 billion, driven by continued growth in Fleet Services. Earnings before interest and taxes (EBIT), adjusted, were \$193 million compared to \$175 million in 1998 — up 10



percent. The company estimated its 1999 EBIT and EPS at \$218 million and \$2.72 per share, respectively including \$25 million in one-time EBIT contributions from the negotiation of merger breakup fees and favorable insurance settlement.

Circle 111 on Reader Service Card

Litton Industries

It has been reported that the combined operation of Ingalls and Avondale will have annual revenue of approximately \$1.8 billion, firm backlog of about \$6 billion and more than 17,000 employees. Presently Avondale has 11 vessels under contract, including five sealifts and two LPD amphibious assault ships for the Navy, three oil tankers for ARCO and an icebreaker for the Coast Guard. Last year, the Navy awarded the company a \$620 million contract to construct two Arleigh Burke class guided missile destroyers.

Circle 112 on Reader Service Card

ExxonMobil

On November 30, 1999, a wholly-owned subsidiary of Exxon Corp. merged with Mobil Corp., making Mobil a subsidiary of Exxon. The agreement called for approximately 1 billion shares of ExxonMobil common stock to be

issued in exchange for all the outstanding shares of Mobil common stock. Earnings in the upstream segment totaled \$5.9 million, an increase of more than 75 percent over 1998. Continued focus on expenses led to an expense reduction of \$640 million, or approximately \$.30 per oil-equivalent barrel.

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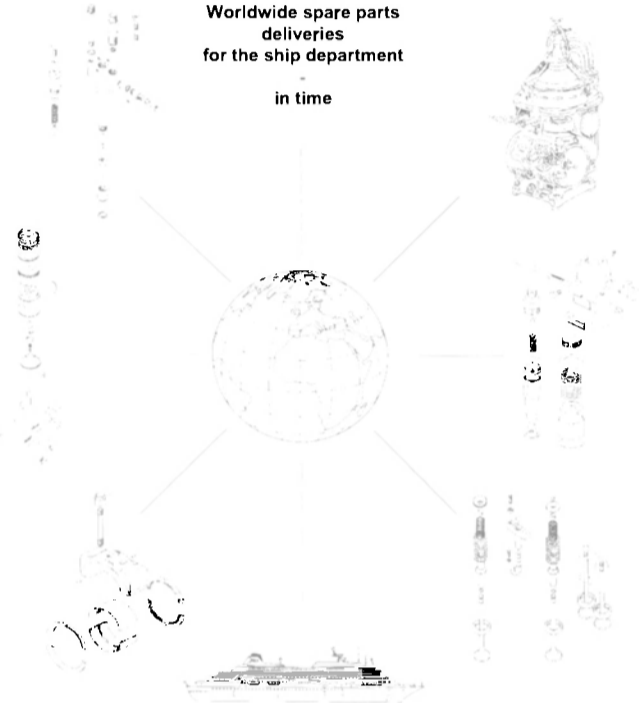
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People & Company News

Todd Shipyards Authorizes Repurchase

The board of directors at Todd Shipyards Corp. have authorized the repurchase up to 500,000 shares of its Common Stock from time to time in open market or negotiated transactions.

The company had previously participated in stock repurchases when management considers the market value relative to the fundamental value of the company to be favorable. The company repurchased an aggregate of 293,700 shares of its common stock during the first nine months of its fiscal year 2000 for a total \$1,915,933. The company did not repurchase any shares during the fourth quarter of fiscal year 2000, and currently has 9,701,480 shares of its common stock outstanding.

NNS First Quarter EPS UP

Newport News Shipbuilding (NNS) reported net earnings of \$21 million, or \$.63 diluted share, for the first quarter of 2000. Earnings before interest and taxes (EBIT) for the quarter were \$47 million, up from EBIT of \$44 million in last year's first quarter.

The company reported first quarter revenues of \$469 million as compared to last year's figures of \$430 million during the same period. This growth in revenue was attributable to gains in the construction and engineering segments. Construction revenues improved \$25 million to \$206 million as a result of advance planning work on the next aircraft carrier (CVN 77), as well as more activity on the Virginia-class submarine program.

NNS finished a nine-month competition for the selection of the Warfare Systems Integrator for CVN 77 this past January.

Nalen Awarded Trophy



Tom Crowley, Jr., (left), presents Charlie Nalen, (right), with the 1999 Thomas Crowley Trophy.

Charlie Nalen, vice president, Environmental Affairs Safety & Quality for Crowley Maritime Corp. was honored for his service with the 1999 Thomas Crowley Trophy, which is the company's highest honor.

Nalen, who is the second employee to receive the honor this year, is credited with helping to establish an environmental management system, as well as spearheading and fast-tracking ISO and ISM certification processes for Crowley operations and vessels on both coasts and internationally.

FirstWave And A&P Form Alliance

FirstWave and A&P Group have laid the foundation for the first global network dedicated to marine repair. This alliance will initially capitalize on the multi-site facilities and knowledge of both companies in offshore vessel main-

tenance, rig repairs and complex conversions. The joint venture also allows both companies to combine marketing and share project management expertise for the delivery of repair and conversion services for clients in the North Sea and Gulf of Mexico. In addition, the alliance is formulating to extend its services into West Africa by year-end.



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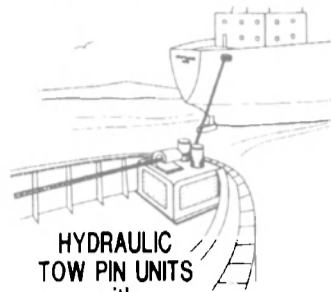


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Geiger Named FGH President

Friede Goldman Halter elected **Paul Geiger, Jr.** as president of Friede & Goldman, Ltd., the company's naval architecture division, which is renowned for its designs of mobile offshore drilling units for the offshore energy industry. Geiger will head FGH's newly consolidated offices in Houston.

Kockums Computer Renamed Tribon Solutions

Kockums Computer Systems is changing its name to Tribon Solutions and plans to launch a new international business concept this summer. Under its new name, the company's new concept will comprise all the design and production stages, as well as all sub-contractors involved in a shipbuilding project, which includes IT applications. This concept offers shipyards internationally with cost-effective solutions in the handling of this part of the logistic pattern.

Specifically, Tribon will consist of the entire shipbuilding process offering shipyards sourcing of materials and services from a complete supply platform.

Circle 1 on Reader Service Card

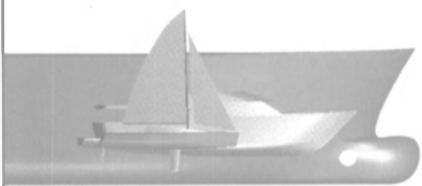
Zodiac Receives New Patents

Zodiac received U.S. patents for two innovations. The patents protect the company's new hull design for rigid-hull inflatables with an altered transom area, as well as its new welded transom attachment method, which provides bonding of the transom without using traditional adhesives. Featuring a transom extending between the rear extremities of the tubes, the new rigid-hull design integrated trim tabs, which improve the ability of the boat to plane quickly, as well as canceling out or lowering bucking once the vessel is planing.

The second patent represents both a new design and assembly method for strengthening the attachment of the transom (motor mount) to the inflatable tube of Zodiac boats without a rigid hull.

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People & Company News

Ameron Names Protective Coatings President



Ameron International Corp. elected **Stephen F. Dickey** as president, Protective Coatings — U.S./Europe, for the Ameron Coatings Group. Dickey, who has

19 years experience with Ameron Coatings, will be responsible for overall management for the worldwide protective coatings operations.

STN Atlas Introduces New Combination Radio-Telephone

A new advanced simplex/semi-duplex VHF radio-telephone with extended Class A DSC functions - the Debeg 6322 - is now available from STN Atlas Marine Electronics. Formatted for compact installation aboard vessels of all



types and sizes, the system melds transmitter, receiver, DSC modem with CH70 watchkeeping receiver and 4W loud-speaker facilities together with an audio amplifier for relay of an additional 6W via external speakers.

Other main features include simplified operation, graphic LCD facilities, aural and visual alarms, an integral real-time clock, and NMEA and printer interfaces. A standard NMEA interface for connection to onboard navigational equipment is also available as part of a transceiver option connector.

Circle 4 on Reader Service Card

Autoship Goes Dot.Com

Autoship Systems, (www.autoship.com), per its partnership with Stargate, (www.stargate.ca) an ISP/ASP provider, has developed jointly a web site whereby their loading planning software, LPS, can be used remotely. Utilizing thin client technology, Autoship can now enable internationally located clients to work with LPS without actually implementing the software on their personal computers.

Remote access through the Internet allows users to run deploy LPS using any available computer with Internet

connection. In addition, the thin client technology allows multiple users to run the same instance of LPS concurrently.

Circle 28 on Reader Service Card

Spitzer Elected President Of Alfa-Laval



Kirk Spitzer was appointed president of Alfa-Laval USA, effective immedi-

ately. Spitzer's appointment proceeds an organizational restructuring of the company, resulting in the consolidation of Separation, Thermal and Flow Businesses into one operating market company, which be known as Alfa Laval USA.

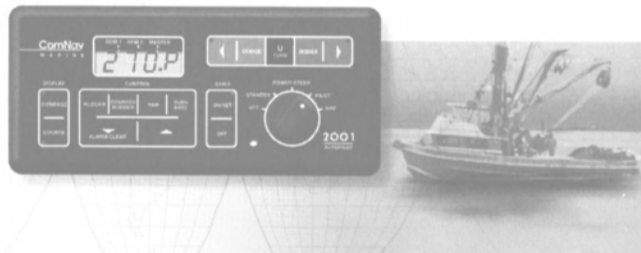
Crowley Appoints VP

Crowley Maritime Corp. has elected **Nancy Ritter** as vice president of Information Technology. Ritter, who is responsible for all

aspects of the company's information technology services, replaces the recently retired **Bob Mohler**.

Based in Oakland, Calif., Ritter will focus on areas such as telephone and data communications systems and satellite data systems.

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Catchot Acquires Product Line From Halter

Harold S. Catchot, president of McElroy/Catchot Co. attained the assets of the Shrimp/Fish Winch products from Halter Marine, who only two years earlier, acquired the McElroy Marine Co. from Predco.

Prior to establishing the McElroy/Catchot Winch Co., Catchot

led his former company (McElroy Machine and Manufacturing Co.) for 25 years through various industry cycles

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Elf Lub Launches Global Oil Analysis

Marine lubricant technology specialist Elf Lub Marine now offers Diagomar Plus — a lubricating oil analysis service



that monitors the performance and condition of marine engines and auxiliary machinery worldwide.

Developed in conjunction with Intertek Testing Services (ITS) Caleb Brett, Diagomar Plus provides on-the-spot analyses of lubricant samples at international locations, with automatic transfer and storage of test results to a full historical database — no matter where the analysis is performed. Laboratories in Rotterdam, Singapore and Houston allow vessels to undergo analyses at their current stop-off port.



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Tom Crowley, Jr. Receives 2000 International Golden Compass

Tom Crowley, Jr., chairman, president and CEO of Crowley Maritime Corp. was honored with the 2000 International Golden Compass award at a gala event in Fort Lauderdale, Fla. last month.

The award, which recognizes those who have achieved high distinction in the maritime world, was presented to Crowley by Allan Milledge, president of the board of directors for Seafarers' House in Fort Lauderdale, Fla.

OMI Senior VP Resigns

OMI Corp. reported that Vincent J. de Sostoa, senior vice president, treasurer and CFO has resigned his position for a position at a start-up technology company, effective later in the second quarter.

Craig H. Stevenson will assume the role of CFO following de Sostoa's resignation.

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Circle 11 on Reader Service Card

Hoegh Re-elected Intertanko Chair

The Intertanko council re-elected Westye Hoegh for a second one-year term as the organization's chairman. Otto Fritzner of Stolt-Nielsen Transportation Group was named vice president, while Lars Carlsson of Concordia

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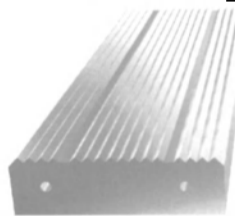
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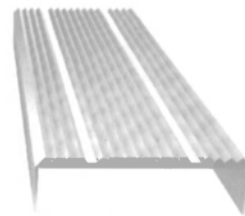
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People & Company News



Westye Hoegh

Spyros Polemis, Paul Slater and H. Tanaka.

Art Anderson Awarded R&D Contracts

Art Anderson Associates was granted three separate research and development contracts for technology development, beginning in the environmental area with a development program that will evolve into design for a pollution-free scrubbing system.

The second contract calls for the company to develop a generic specification for installation of a fuel cell propulsion plant in commercial vessels in order to further introduce this technology into commercial application. Art Anderson will focus on the aspects of fuel cell technology aboard vessels, as well as regulatory intent within specifications developed.

Calling for the firm's patented work in floating terminals, the third part of the contract is comprised of two phases. The first consisting of Art Anderson, as well as Advanced Marine Concepts and Nichols Brothers working to advance the development of a modular floating system that is convertible for commercial and military use. The second phase focuses on prototype development and testing.

Lind Elected Metro Senior V.P.

Raimo Lind was named senior vice president and CFO of Metra Corp., effective May 15, upon the resignation of the company's current CFO, Timo Lehto.

In addition to his new appointment, Lind will continue to serve in his current position as group vice president and CFO of Wartsila NSD, which he assumed in 1998.

MTN Completes Purchase Agreement

Maritime Telecommunications Network (MTN), a subsidiary of ATC Teleports, has finalized a definitive Asset Purchase Agreement to attain specific assets of CruisePhone for approximately

\$1 million.

CruisePhone, which previously filed for relief under Chapter 11 of the U.S. Bankruptcy Code, was permitted by the court to complete the sale of assets to MTN. Following a hearing, which occurred in the U.S. Bankruptcy Court for the District of New York, Cruise-

Phone is expected to transfer all of its services to MTN on June 31.

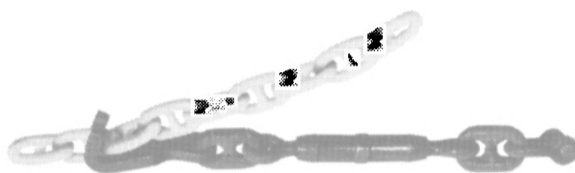
Mobex Purchases Watercom From ACL

Mobex Communications has entered into an agreement with American Com-

mercial Lines (ACL) for its subsidiary Waterway Communications System LLC (Watercom), which is a provider of automated ship-to-shore voice, data and telecommunication services.

Headquartered in Jeffersonville, Ind., Watercom provides communications for towboats, yachts, dredges, survey ves-

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People & Company News

sels, cruise/dinner boats and gaming vessels in more than 20 states on the Gulf of Mexico. The agreement states that Watercom must continue services for ACL, giving Mobex control of Watercom's customer base.

Circle 59 on Reader Service Card

Willard And MetalCraft Construct Premiere RIB

Willard Marine and MetalCraft Marine have launched and tested successfully a premiere Aluminum/FRP hybrid RIB. In addition, the vessel is known as the first identical standard U.S. Navy 730 hull to be built in aluminum. A standard one piece, molded FRP deck assembly by Willard Marine is coupled to the aluminum hull.

The vessel provides a sturdy, low maintenance



interior finish - its molded shape available exclusively with FRP production. Other advantageous features include lower production costs and noticeable sound deadening qualities.

Powered by a 300-hp Yanmar diesel engine and Mercruiser Bravo One drive, the vessel achieved in excess of 55 mph in a one to two ft. chop condition during initial trials running at full fuel. Considerable weight saving of the hybrid was considerable; according to Willard's

engineers, it can be lowered even further as certain structural elements of the deck assembly are now a function of the aluminum hull.

Circle 63 on Reader Service Card

KPN And Telstra Form Joint Venture

KPN (Royal Dutch Telecom) and Telstra have agreed to form a joint venture company by merging their respective mobile satellite communications businesses. The new company, which will trade as Station 12 - is positioned to be a major player in the global satcom industry.

Contributing an approximate combined figure of \$145 million in net tangible assets to launch the venture, with KPN holding 65 percent of equity shares and Telstra holding the remainder, the new company has projected an initial annual revenue around \$250 million.

Carnival Senior VP To Retire

Meshulam Zonis, senior vice president of operations for Carnival Cruise Lines, announced that he will seek retirement, effective December 31.

A member of the original group spearheaded by the late Ted Arison, who in 1972, established what is now known as the world's largest cruise line, Zonis began his career with Carnival as vice president of operations. Responsible for overseeing all aspects of the company's shipboard operations for the past 28 years, Zonis has held his current position since 1980 and was appointed to its board of directors in 1987 — the year that Carnival went public.

Bollinger Promotes Detillier To Executive V.P.

Bollinger Shipyards has promoted Mark Detillier to executive vice president of repair, responsible for all repair and conversion performed at Bollinger's nine southeast Louisiana shipyards, as well as all of the company's 23 dry docks.

Since joining the company in 1979, Detillier has held various positions, such as foreman, assistant shipyard superintendent and division vice president at Bollinger's Larose, La. shipyard.

Austal Makes Way For Ferries

Austal USA has purchased nine acres of real estate situated on the east bank of the Mobile River — across from the Mobile Convention Center. With clearing scheduled to begin soon, the building of a fabrication center and installation of a vessel launching system for the construction of high speed ferries is

Maritime Reporter/Engineering News

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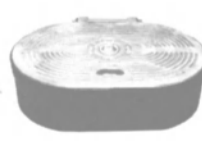
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Version 7 Update

After several months of testing and regular use in the field, it is clear that GHS Version 7 for Windows is exceedingly successful:

- It's faster than anyone expected!
- It's stable and trouble-free.
- It's 100% compatible with data files from version 6.

Watch for exciting new GHS developments in 2000. Remember that while it may be imitated, there is only one genuine GHS!

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People & Company News

scheduled for a September 2000 completion.

The company was also granted a permit from the U.S Army Corps of Engineers (USACE) to donate \$60,000 to the Alabama Department of Conservation and Natural Resources, Marine Resources Fund.

P&O And Festival To Team Up

The Peninsular and Oriental Steam Navigation Co. (P&O) and Festival Cruises have agreed, subject to contract, to join together in the expansion of the global cruise business. Festival will join P&O Cruises, Princess Cruises and Germany's Aida Cruises, positioning it as the world's most international cruise company. Included in the merger is Festival's existing fleet of four vessels and its pan-European sales and marketing network of subsidiaries in 10 countries.

HydroComp Now Represented In China

HydroComp of Durham, N.H. has established a presence in Mainland China with the addition of its newest dealer, Propwave.com. Founded by **Jason Ma**, who has more than 12 years of industry experience, Propwave represents seven internationally known propeller manufacturers, as well as consulting services. The company's newest dealer will be exhibiting at the second China Wuhan International Inland River Expo from June 13-16 at the Central China International Fair Center in Wuhan, P.R., China.

Circle 64 on Reader Service Card

Grand Alliance And Americana Agree

Subject to regulatory approval, the member lines of the Grand Alliance and Americana Ships reached an agreement for the Grand Alliance to enter the Transatlantic Trade, effective July 4, 2000.

The Grand Alliance will cooperate with Americana

Ships, (who represent Lykes Lines and TMM Lines) deploying technologically-driven modern tonnage on five separate loops providing shippers with an extended range of direct port calls in Europe, the U.S., Canada and Mexico. Members of both organizations have committed jointly to the most comprehensive service available on the transatlantic trade, deploying vessels on five dedicated loops.

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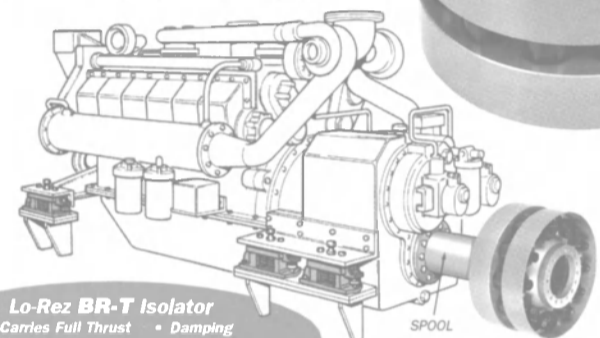
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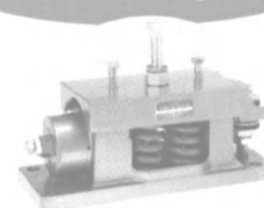
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People & Company News

Golden Ocean Group Says Trade Reports Not Valid

Golden Ocean Group Limited and the Official Committees of Unsecured Creditors representing the creditor-body of Golden Ocean Group companies in Chapter 11 proceedings pending in U.S. Bankruptcy Court reported that there is

no validity to trade reports that **Nicholas Goymer**, as well as interests he purports to represent, have taken a strategic position in Golden Ocean Group Limited or its parent company. Goymer's representations that he acts for various strategic interests have deemed inaccurate, and it is not clear whom he currently represents.

Golden Ocean has confirmed that it has determined that Goymer has entered into an arrangement with the Channel Rose Trust — a trust established by the former chairman and president of Golden Ocean Group Limited, Fred WY Cheng, to purchase from his family trust the stock of Golden Ocean Limited.

Alfa-Laval Expands U.S. Presence

Alfa-Laval has opened a new location in Florida to better serve its customers of that region. **Torgrim Stokkland**, **Michael Storey** and **Miguel Erickson** are now operating out of the company's new office, which primarily supports Florida and U.S. territories in the Caribbean regarding capital sales.

Circle 3 on Reader Service Card

JE Hyde Appoints Taylor

JE Hyde elected **Stephen Taylor** to the company's board of directors. Taylor, who is the sixth director, will be based in London. He joins JE Hyde from H Clarkson, where he has been a main board director and worked for more than 17 years in the sale and purchase department.

NMEA Commences Beta Testing

The National Marine Electronics Association (NMEA) commenced a beta testing program for the new NMEA 2000 network interface standard. Developed in order to comply with the increased data communications requirements of modern marine electronics systems while simplifying shipboard cabling requirements, it will supplement the earlier NMEA 0183 protocol — the standard for interfacing marine electronics devices.

A bi-directional transmitter, NMEA 2000 is also a multi-transmitter, multi-receiver serial data network interface whose equipment will be able to share data with other compatible devices over an individual signaling channel.

Lubrizol And GE Announce Joint Venture

GE Transportation Systems and The Lubrizol Corporation will form a joint venture company to develop and market products and services to manage critical diesel engine fluids to optimize service intervals and improve fuel consumption and fueling processes. This joint venture brings together the remote monitoring and diagnostics capabilities of GE Transportation Systems and the fluids management technology and equipment of Lubrizol's performance systems group.

Featuring FluiPak™ technology, the joint venture's products and services provide for on-board, real-time assessment of the condition and replenishment of fluids, such as engine oil. By automatically monitoring fluid levels and quality, FluiPak is designed to optimize service intervals, monitor equipment condition and reduce operating costs.

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Port Canaveral Maritime Academy is located on Florida's Atlantic coast just minutes from Kennedy Space Center and Cocoa Beach. It's an ideal location for students to combine training classes with an enjoyable stay at Florida's most affordable beach accommodations. And Orlando's top attractions are just a short drive away.

The next five-day combined Basic & Advanced Marine Fire Fighting course begins September 11, 2000.

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People & Company News

The Remote Fluid Management Services will be provided through GE's Remote Monitoring and Diagnostics Service Center, providing GE Transportation Systems information-based services to the railroad and mining industries.

The new company will begin operations in the second quarter of this year and will be located in northeastern Ohio. GE will own 51 percent of the new enterprise, and Lubrizol will hold 49 percent.

Boatrac and ICTI Team Up At OTC

Boatrac and Innovative Communications Technologies, Inc. (ICTI) jointly exhibited at the Offshore Technology Conference (OTC) held in Houston during May. Both companies demonstrated how ICTI's BEST Technology can be integrated and used in a marine environment — substantially lowering transmission costs. Boatrac also unveiled Netverk's MarStar software following being named its exclusive North American distributor.

Circle 12 on Reader Service Card

Schlumberger Provides Solutions With CemStreak

Schlumberger Oilfield Services has developed the CemStreak pumper, a compact land cementing unit that successfully completed field testing in both the U.S. and Canada. Cemstreak is designed to handle land cementing needs and facilitates operations in difficult and hard-to-reach drilling locations. The lightweight, low maintenance four wheel drive truck is specially formatted for quick rig-up, rig-down and clean up. Its quick turnaround time allows it to successfully perform more than six jobs in one day during field tests.

Pinpoint's Microgage Kit Is Quick And Easy

Pinpoint Laser Systems' Microgage 1000 provides versatile measuring and alignment to tight precision over a vari-



ety of diverse applications. Operating over a range of 30 ft., the microgage provides precision of .00002 in a user-friendly package.

June, 2000

The complete kit is suitable for machinery alignment, measuring runout, checking travel linearity and precision field installations. The RS-232 serial interface can be easily attached to a computer for scaling and recording readings, thus enhancing the possibilities for measuring analysis.

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Alaska Marine Pilot Performance At RTM

RTM Star Center completed the premiere Alaskan Marine Pilot Simulator Based Performance Training and Evaluation on March 17. Dedicating the past year to the program's development, Star Center focuses on the assessment of

pilot performance in a simulator. To date, this program is the only one of its kind that links pilot license renewal to a successful performance evaluation.

Johnson Pump Expands

Swedish-Dutch pump manufacturer, Johnson Pump is currently expanding its

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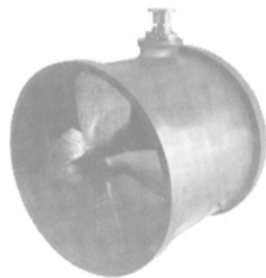
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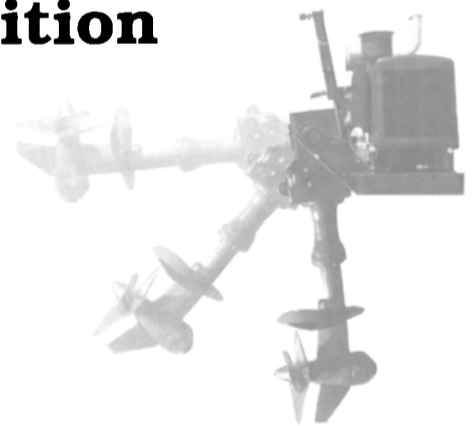
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People & Company News

worldwide presence beginning with the appointment of Meridian Marine Corp. as its exclusive agent for Canada, U.S., Central and Latin America, servicing the Commercial and Pleasure Marine sectors. Established in 1968, Meridian's specialized team works to provide product and logistics support.

Instruments, Computers & Controls Goes Digital

Measuring horsepower, rpm and torque on rotating shafts by utilizing fiber optic sensors, the Digital Torque Meter System, developed by Instru-

ments, Computers & Controls is flexible and highly reliable.

Typically holding a NEMA 4 enclosure with shaft hp and rpm displays, the System is also available in portable mode so it can be used from ship to ship. Its fiber optic based technology, and all electronics, except for the sensor LEDs

are within the NEMA 4 enclosure. No connections are formulated inside the box during installation or calibration because the fiber optic sensors and cable are already wrapped around the NEMA 4 enclosure during shipment for a standard system. The sensors are typically mounted across a bearing housing and mounting plates are epoxied to the bearing to mount the sensor.

Once the system has been installed and calibrated, it is not necessary to recalibrate because the system does not drift. Calibration is completed without using any tools or turning of any potentiometers, and recalibration can be checked at any time.

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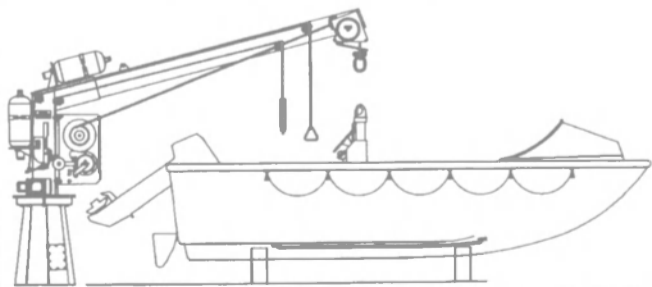
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Stallings Named Sales Director

Argosy Shipping elected Thomas Stallings as sales and marketing director, overseeing all of the company's sales and marketing efforts, as well as implementing its overall marketing strategy. Stallings, who has more than 15 years of ocean transportation experience, previously supervised sales teams both in the U.S. and internationally for Crowley Marine Transport.

Investor Group To Acquire Aalborg Industries

Headed by Axcel, an investor group has formalized an agreement with the Danish company J. Lauritzen Holding to attain Aalborg Industries.

Aalborg, which is one of Denmark's large industrial companies specializing in the field of boilers and other heat generating equipment, agreed to allow investors to set up a new holding company with shares to be distributed among the investor group. The investor group also includes LD, FIH, and Aalborg president and CEO **Freddy Frandsen**; senior vice president and CFO **Svend Ole Aagren**; and group vice president **Jorn Nielsen**.

Suncor Names Sales Manager

Suncor Stainless has named **Rochelle L. Lester** as its Florida sales manager, who will represent the company from its St. Petersburg, Fla. office.

Lester, who has more than 20 years experience within the OEM marine market, will be responsible for promoting Suncor's products and custom manufacturing capabilities.

Crowley Elects International Marketing Director

Crowley Marine Services has appointed **Nate Asplund** as director of International Marketing. Asplund's principal responsibility will entail developing the

Maritime Reporter/Engineering News



company's logistics and related multi-year service contracts for the energy industry, specifically within

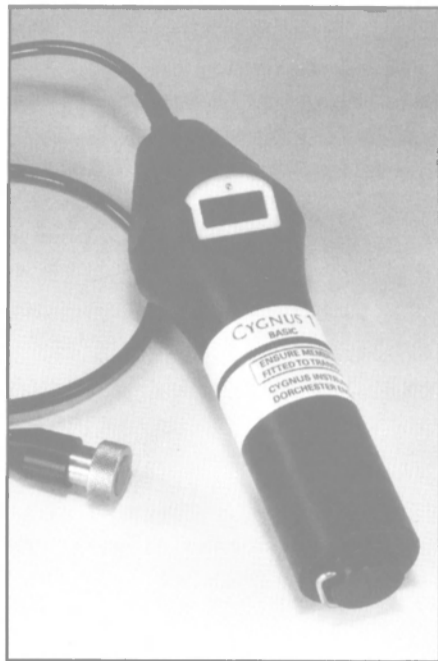
the international arena.

For the past two years, Asplund has served as director of marketing and solutions development for Crowley Logistics, assisting in the establishment of the corporation's Third Party Logistics Division.

Asplund joined Crowley in 1994 as a corporate planning senior analyst in Oakland. Since that time, he has held various positions within the company including manager for Crowley Marine Services in Seattle, Wash.

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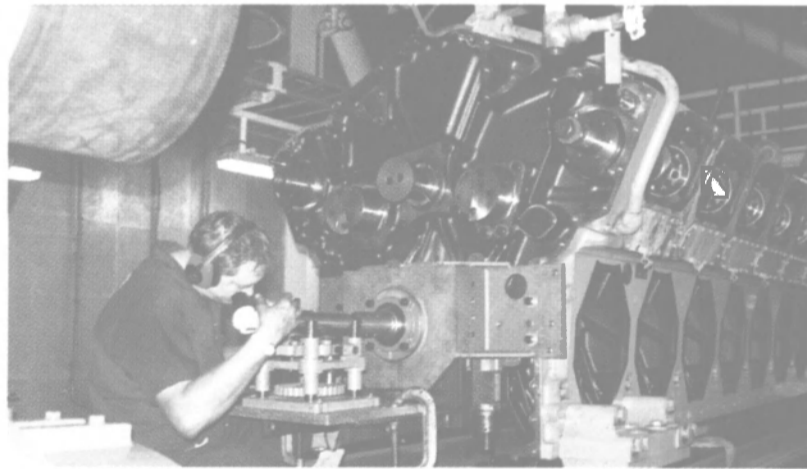
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THE WORLD YEARBOOK • CONTAINERSHIP MARKET REPORT

(Continued from page 54)

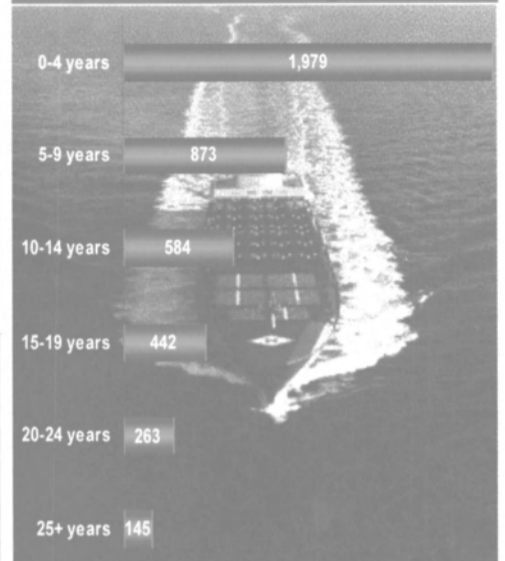
ger, faster vessels. The orderbook more than doubled from 205,400 TEU in 1992 to 460,100 by 1994, and would nearly double again to 859,200 TEU by 1996. The orderbook registered an average of 24.9 percent of the current fleet in order to meet these demands. From 1993-

1994, charter rates for sub-Panamax vessels jumped more than 19 percent to \$21,272, and continued to strengthen for the next two years peaking at an all-time high of \$22,442 in 1996.

Phase 2 (1997) The Overhang: However, on the wings of its third year of low double digit fleet growth, rates began to

slide in 1997. Saturated by the onslaught of new deliveries, the industry started to experience an overhang of existing capacity as strong world container traffic growth, which averaged 10.1 percent from 1993-1996, started to slow down. In 1997, traffic slipped to 8.6 percent, its lowest rate since 1989, while the fleet continued its growth spurt up 15.1 per-

Containership Fleet Age Profile



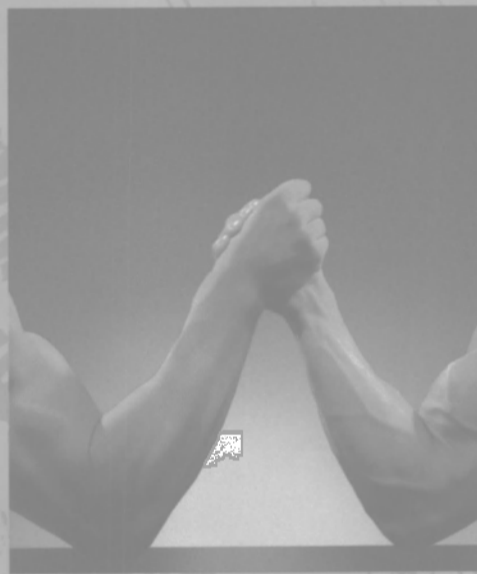
cent. As a result, average charter rates for Panamax vessels dropped 7.9 percent to \$20,675, marking the beginning of a major fall-off.

Phase 3 (1998-mid-1999): The Asian Crisis and a Flooded Market: In 1998, the situation worsened when consumer demand suffered from the major economic crisis in Asia and Latin America. World container traffic plummeted to 3.7 percent, an all-time low, and much below the level needed to offset the 12.1 percent fleet growth from 1998 (and prior years). However, the second half of 1999 brought some hope for a rebound.

Phase 4 (Second Half 1999-2000): Commence Recovery: Global economies in 1999 improved, and a significantly lightened delivery schedule saw only 5.4 percent fleet growth, the lowest level since 1981. In addition, world recorded container traffic returned to a healthy seven percent, leading the way for a supply/demand balance hat had not been seen since the early 1990s. Currently, average charter rates for Panamaxes, which hit a low in 1999 of \$15,475, have climbed their way back to \$18,750, and world traffic growth is expected to register eight percent in 2000. Despite the good news, there is not compelling proof that the worst is over yet. In mid-1999, a post-Panamax ordering boom began, which has pushed the orderbook past the one million TEU level for the first time since 1997, and the expected scrapping of 48,000 TEU does not even put a dent into the problem. While deliveries for 2000 are only equivalent to 11.5 percent of the current fleet and will not likely have a major impact on the fundamentals of the fleet, the psychology of what is to come over the next two to three years could.

The preceding was excerpted from ING Baring's Maritime Industry - Spring 2000 Outlook report, presented in New York in March 2000.

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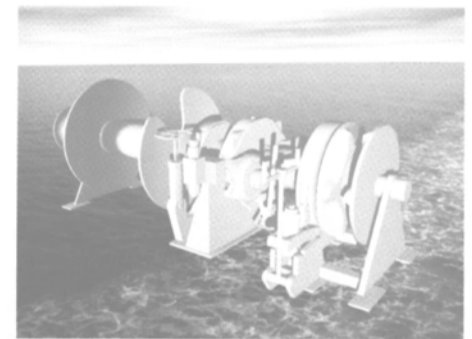
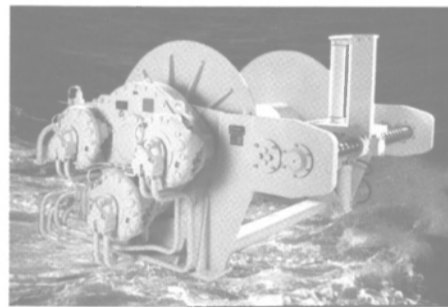
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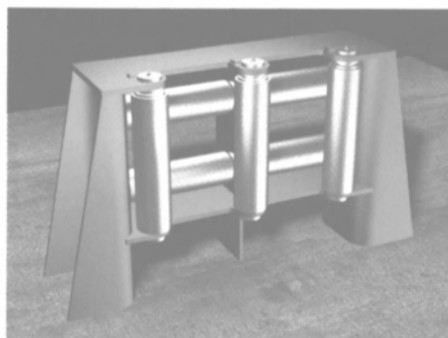
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Manly Manne, P.O. Box 86788

HEAT EXCHANGERS
Alfa-Laval Separation, Inc., 955 Meams Rd., Warrminster, PA 18974
Computer-Britania Heat Transfer Ltd., 15-20
Coates Industrial Estate, Station Road, Coleshill, Birmingham B46 1P, UK
Crane Heatex, 17 Grandview Ave., West Orange, NJ 07052
Tranter, Inc., P.O. Box 2288, Wichita Falls, TX 76707

HEAT TRANSFER FLUID
Paratherm Corp., 1050 Cowell Rd., Conshohocken, PA 19428

HOISTS
Holly Host Corp., P.O. Box 86, St. Clair Shores, MI 48080-0086

HOIST RINGS
Jergens Inc., 15700 S. Waterloo Rd., Cleveland, OH 44110

HORNS/WHISTLES
Atlantic Mfg. Co. Ltd., 5478 267th Street, Gloucester, Industrial Estate, Langley, B.C. Canada V4W 3S8
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Kockum Sonics Inc., 933 Industry Rd., Ste105, Kenner, LA 70062

HYDRAULICS
Cunningham ManneHydraulics Co., Inc., 201 Hamson Street, Hooken, NJ 07036
Dayton T. Brown, 555 Church St., Bohemia, NY 11716
Engine Monitor, Inc., 179 Hickory Ave., Harahan, LA 70123
Hamilton Jet, P.O. Box 709, Christchurch, NEW ZEALAND
Offshore Inland, Inc., 3521 Brookdale Drive, Mobile, AL 36618
Jura Hydraulics Limited, Cheltenham Road East, Gloucester, GL2 9QN, ENGLAND
Demaree Inflatable Boats, 310 Oak St., Friendsville, MD 21531
Ocean Technical Services Inc., 1140 Peters Rd., Harvey, LA 70058-1705

HYDRAULIC TRAINING
Consolidated Fluid Power, 155 Wright Ave., Dartmouth, N.S. Canada B4C 3M1

INCINERATORS
Therm-Tec Inc., PO Box 1105, Tualatin, OR 97062

INFLATABLES
Ocean Technical Services Inc., 1140 Peters Rd., Harvey, LA 70058-1705
Zodiac of North America, P.O. Box 400, Thompson Creek Rd., Stevensville, Sparks, MD 21152

INSULATION
Bohm & Voss Light Insulation, Barnes & Laders GmbH, Norderebstrasse 15, 20457, Hamburg, GERMANY
Panel Specialists, Inc., Thermo, 3115 Range Rd., Temple, TX 76501
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123
Mascoat Products, 3500 E. T.C. Jester, Suite N, Houston, TX 77018
Pacor, Inc., P.O. Box 107, Westville, NJ 08093
Superior Enrgies Inc., P.O. Drawer 386, Groves, TX 77619

INTEGRATED MONITORING SYSTEMS
Dalastar, Unit 100, 18 Gostick Place, N. Vancouver, BC Canada

INTERIORS
Bauer Interiors, 733 Dante St., New Orleans, LA 70118
Custom Shop Interiors, Inc., P.O. Box 882, Solomons, MD 20688
Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980
Hopeman Brothers, 1 E. Brouard Rd., Ft. Lauderdale, FL 33301
Insulations, Inc., Rt. 5, 12360 Leisure Rd., Baton Rouge, LA 70807
Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave., Boca Raton, FL 33431
Manne Accommodations, Inc., 3830 Williamsburg Park Blvd., Building 7, Jacksonville, FL 32257
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

ISOLATORS
Lo-Rez Vibration Control, Ltd., 186 West 8th Ave., Vancouver, B.C. V5Y 1N2

JET BOWTHRUSTERS
Thrustmaster of Texas, P.O. Box 840189, Houston, TX 77084-0189

JOINER - Watertight Door - Paneling - Ceiling System - Decking
Al Alpha Intl., Inc., P.O. Box 498885, Cincinnati, OH 45249
Branton Ind., 1101 Edwards Ave., Jefferson, LA 70181
CustomShip Interiors, Inc., P.O. Box 882, Solomons, MD 20688
Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980
Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123
Manne Accommodations, Inc., 3830 Williamsburg Park Blvd., Building 7, Jacksonville, FL 32257
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Panel Specialists, Inc., Thermo, 3115 Range Rd., Temple, TX 76501
Walz & Krenzer, 91 Willenbrook Rd., Unit B4, Oxford, CT 06478

KEEL COOLERS
R.W. Fernstun & Co., 1716 Eleventh Ave., Menominee, MI 49858
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

LASER ALIGNMENT
Boland Industrial & Consulting Services, P.O. B. 91360, Mobile, AL 36691

LAUNDRY EQUIPMENT
Richard Galley Supply, PO Drawer 4035, Houma, LA 70061

LIFEBOATS/RAFTS
DBC Marine Safety Systems, 12351 Bridgeport Rd., Richmond, B.C. CANADA V6V1J4
Fr Fassmer & Co., D-27804 Beme Motzen, Germany, IndustriestraBe2
Norsale AS, P.O. Box 115, N-4818 Faervik, Norway
Edgewater Machine & Fabricators, P.O. Box 358, Edgewater, FL 32132-0358
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136
Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America, P.O. Box 400, Stevensville, MD 21152

LIFEBOATS REPAIR
Nautical Safety Products, P.O. Box 590462, Houston, TX 77259
Willem Pot, P.O. B. 29102, 3001 GC Rotterdam

LIFESAVING EQUIPMENT
MGI International, 119-225 West 1st St., North Vancouver, B.C. CANADA
Steam Manufacturing, P.O. Box 1498, St. Cloud, MN 56302
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136
Zodiac of North America, PO Box 400, Thompson Creek Rd., Stevensville, Sparks, MD 21152

LIFT EQUIPMENT
JLG Industries, Inc., JLG Drive, McCallsburg, PA 17233-9533

LIFT EQUIPMENT TESTING
Water Weights Inc., 5139 Brooks St., Suite E, Montclair, CA 91763

LIGHTING SYSTEMS / EQUIPMENT
ACR Electronics, Inc., 5757 Ravenswood Rd., Ft. Lauderdale, FL 33310-5247
Archway Marine, 4501 Swan Ave., St. Louis, MO 63110
Goltens Marine, 160 Van Brunt St., Brooklyn, NY 11231
Kockum Sonics, Inc., 933 Industry Rd., Ste105, Kenner, LA 70062
Paujhu Electric Mfg. Co., Inc., P.O. Box 53, Pearland, TX 77588
Francis Searchlights/Slam Supply Co., 4415 6th N.W., Seattle, WA 98107

LIQUID OVERFILL PROTECTION SYSTEMS
King Engineering Corp., P.O. Box 1228, Ann Arbor, MI 48106

LOGISTICS
V.L. Logistics Consultants, Inc., 3420 Blenville Blvd., Ocean Springs, MS 39564

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Goltens - New York Corp., 160 Van Brunt St., Brooklyn, NY 11231

Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27604-1851
Maritime Power 200 Henderson St., Jersey City, NJ 07302

MANAGEMENT SYSTEMS & SERVICE
Hornblower Manne, Pier 3 Ferryboat Santa Rosa, San Francisco, CA 94111
PCS Marine, 174 Colonnade Road S., Nepean, Ontario K2E715

MARINE ACCOMMODATIONS
Manne Accommodations, Inc., 3830 Williamsburg Park Blvd., Building 7, Jacksonville, FL 32257

MARINE BUILDING SUPPLIES
King Wholesale Supply, Co., Inc., P.O. Box 4002, New Orleans, LA 70178-4002

MARINE CEILINGS
Hugo Aluminium Vik Verk, N-5880 VIK I SOGN, Norway
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge,

Nautical Designs, Inc. 2101 S. Andrews Ave. Suite 202, Ft. Lauderdale FL 33316
Olsen Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777
M. Rosenblatt & Son, Inc., 2341 Jefferson Davis Hwy, Arlington, VA 22202
Sargenti & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
Scientific Marine Services, Inc., 101 State Pl., Suite F., Escondido, CA 92029
Sea School, 10812 Gandy Blvd., St. Petersburg, FL 33702
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426
George G. Sharp, Inc., 100 Church St., New York, NY 10007
R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
MSCI Inc., 1452 Duke Street, Alexandria, VA 22304
Sea Transport Corp., PO Box 1043, Southport Qld 4213 Australia
U.S. Ship Design, 705 S. E. 24 M St., Ft. Lauderdale, FL 33316
Vibtech, Inc., Box 435, N. Kingston, RI 02852
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544

NAVIGATION & COMMUNICATIONS EQUIPMENT

Byrne Rice & Turner, 1172 Camp St., New Orleans, LA 70130
C-Map/Commercial, 133 Falkmud Rd., Mashpee, MA 02649
C-Map, P.O. Box 212 4371 Egersund Norway
Corelec Inc., Prince Charles Bldg., 120 Torbay Rd., Suite E100,
St. Johns, Newfoundland, Canada A1A 2G8
Electronic Marine Systems, 800 Ferrndale Pl., Rahway, N.J. 07065
Funuro U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
ICS Electronics Ltd., Unit V, Rufford Industrial Estate, Ford,
Arundel, West Sussex, UK
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851
Negron Marine Consultants, 840 Bond Street, Elizabeth, NJ 07201
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
Raytheon Marine Co., 676 Island Pond Rd., Manchester, NH 03109
Scandinavian Micro Systems P.O. Box 155, N-1411, Kolbotn, NORWAY
Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036
Simrad Robertson, 10801 Hammerly, Suite 100, Houston, TX 77043-1923
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Trimbale Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130
Offshore Systems International, 5013 Pacific Hwy East, Fife, WA 98424
Offshore Systems International, 107-930 W. 1st St., N Vancouver,
BC Canada V7P3N4

Liton Marine Systems, 1070 Semirole Trail, Charlottesville, VA 22901-2591
Magellan Systems Corp., 960 Overland Crt., San Dimas, CA 91773-1742
Icom America, Inc., 2380 116th Ave. NE, Bellevue, WA 98004
KVH Industries, Inc., 110 Enterprise Center, Middleton, RI 02842-5268

NOISE & VIBRATION

Soundcoat, 1 Burt Dr., Deer Park, NY 11729
Noise Control Engineering, 795 Middlesex Turnpike, Billerica, MA 01821

NOZZLES/NOZZLE SYSTEMS

Harrington Metals, 6720 124th Ave., Farmville, MI 49408
Custom Nozzle, P.O. Box 547, Pascagoula, MS 39568

OFFSHORE BUILDINGS

Pinnacle Building, 306 Caldwell Ave., Erath, LA 70533

OIL—Marine—Additives—TESTING

Mobil Oil Corporation, 3225 Galwos Road, Fairfax, VA 22037-0001
Castrol North America, 1500 Valley Rd., Wahne, NJ 07470

OIL TANK CLEANING

Brain Industries Australia, Pty. Ltd., 21 Bearing Rd., Seven
Hills, NSW 2147 AUSTRALIA

OIL/WATER SEPARATORS

Alfa-Laval Separation, Inc. 955 Meams Rd., Warminster, PA 18974-0556
Alfa-Tec, Inc., 4027 21st Ave. West, Seattle, WA 98199
Blohm & Voss Industrie GmbH, P.O. B. 100720, D-2000 Hamburg 1, GERMANY
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
MMC International, 60 Inip Dr., Inwood NY 11096
Nelson Industries, Highway 51 West, Sloughon, WI 53589
RGF Environmental Group, 3875 Fiscal Court, W. Palm Beach, FL 33404

PAINTS/ANTI-FOULANTS

Joun Panis Inc. 1401 Severn St., Baltimore, MD 21230

PARTS LOCATOR SERVICE

Inventory Locator Service, 3965 Mendenhall Road, Memphis, TN 38115

PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS

Jesse Engineering, 5225 7th St. East, Tacoma, WA 98424
Georg Fischer DISA Pipe Tools Div., 407 Hadley St., Holly, MI 48442
Lokring Corp., 396 Hatch Drive, Foster City, CA 94404
Vitaulic Co., 4901 Kestersville Rd., Easton, PA 18042
Blucher Josam, 2501 S. Front Street, Philadelphia, PA 19148

PNEUMATIC HOISTS

J.D. Neuhaus, 9 Loveton Circle, Sparks, MD 21152

POLLUTION CONTROL PRODUCTS

Enecon Corporation, 125 Baylis Rd., Melville, NY 11747-3800

PORT DEVELOPMENT

RTM Star Center, 2 W. Dixie Hwy., Dania, FL 33004

POWER SUPPLIES

Schaeler, Inc., 200 Butterfield Dr., Ashland, MA 01721

PROPELLERS—Repairs

Kahlenberg Bros. P.O. Box 358, Two Rivers, WI 54241
Byrne Rice & Turner, 1172 Camp St., New Orleans, LA 70130
Holland Roer Propellers, 2273 Batastaria Blvd., New Orleans, LA, 70072
Phoenix Marine Inc., 2361 Jefferson Davis Hwy Suite 140 Arlington, VA 22202
Rice Propeller, Av Rios Espinoza No. 88, Col. Benito Juarez,
Mazatlan, Sin, Mexico 82180
Proper Pitch, P.O. Box 314, Seyberville, DE 19975

PROPULSION EQUIPMENT

—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Avondale Industries, Harvey Quick Repair, P.O. Box 116, Harvey, LA 70058
American Air Filter, P.O. Box 25690, Louisville, KY 40432
ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201 0372,
ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND
ABB TURBOCHARGER, INC., 1460 Livingston Avenue, N. Brunswick, NJ 08902
Aquamaster-Raumla Ltd., Box 220, SF-26101, Rauma, FINLAND
Kamewa America Inc., 106 Park Place, Suite 200, Covington, LA 70433, USA
Kamewa AB, Box 1010, S-68129, Kristinehamn, Sweden
Kamewa Finland Oh, 'Aquamaster', Box 220, FIN-26101 Rauma, Finland
Kawasaki Heavy Industries, Ltd., Tokyo Head Office, World Trade Center Bldg.,
4-1 Hamamatsu-cho 2-chame, Minato-ku Tokyo 105-6116 Japan
Brunvoll A/S, P.O. Box 370, N-8401, Moide, Norway
ZF Marine 3131 SW 42nd St., Ft. Lauderdale, FL 33112
Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320
Centa Corp., 8185 Cass Ave., Darien, IL 60561
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492
Fincantieri, Diesel Engines Div.—GMT, Bagnoli della Rosandra 334, Trestle, ITALY
Jan Verhaar Omega Thrusters, P.O. Box 119, 2340 AC Oegstgeest, NETHERLANDS
GEC ALSTHOM Diesels Inc., 10801 Kempwood Dr. Ste 1, Houston, TX 77043-1412
Gottens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231
Hartmaster Marine Inc., 31777 Industrial Rd., Livonia, MI 48150
Harrington Metal, 6720 124th Ave., Farmville, MI 49408
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Kaplan and Association, 30808 Crest Forest, Farmington MI 48331
Krupp B&W, 7555 Danbro Crescent, Mississauga, Ontario, CANADA L5N 6P9
LIPS B.V., P.O. Box 6, 5150 BB Drunen, The Netherlands
Lohmann & Stolterfoht, P.O. Box 1860, D-58408 Witten, Germany
Lo-Rez Vibration Control, 186 West 8th Ave., Vancouver, BC CANADA, V5Y 1N2
Mapeco, Inc., 91 Willenbrock Rd., Unit B4, Oxford CT 06478
Markisches Werk, P.O. Box 1442, D-5884 Halver GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Høleby, DENMARK
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15, DK-9900
Frederikshavn, DENMARK
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-86153
Augsburg 1 GERMANY
Omnithruster Worldwide, 30555 Solon Ind. Pkwy., Cleveland, OH, 44139
Orion Corp., 1111 Cedar Creek Rd., Grafton, WI 53024
Oy Wartsila Ab, Vasa and Abo Divisions, P.O. Box 244, SF65100 Vasa, FINLAND
Propulsion Systems Inc., 601 N.E. 28th, Pompano Beach, FL 33064

Karl Senner Inc., 25 W Third, Kenner LA 70062
Schottel-Werft, Manizer Strasse 99, D-56322 Spay/Rhein, GERMANY
Siemens Inc., 500 Industrial Blvd., Sugar Land, TX 77478
Schottel Inc., 1180 Courtyardpark Rd., Mississauga, ONTARIO
Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey LA 70055-0008
Thrustmaster of Texas, P.O. Box 840189-12227 IFM 529, Houston, TX 77284-0189
Ulstein Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY
Ultra Hydraulics Limited, Cheltenham Road East, Gloucester, GL2 9QN, ENGLAND
Voith Hydro Marine Technology, P.O.B. 1125, D89509, Heidenheim, GERMANY
Marine Propulsion Inc., 1505 Corbin Ave., Hammond, LA 70403
The Cincinnati Gear Company, 5657 Wooster Pike, Cincinnati, OH 45227
Renold Hi-Tec, 512 W. Crescentville Rd, Cincinnati, OH 45246
U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave.,
Great Neck, NY 11021
Schottel-Werft, Josef Becker GmbH 1 & Co. KG,
HRP, 432 Realty Dr., Dreina, LA 70056

PUMP—Repair—Drives

Alfa-Tec, Inc., 4027 21st Ave. West, Seattle, WA 98199
Scardana Americas Bkg, 502 Empire St., Greefield Park, J4V1V7 Canada
Advanced Environmental Systems, 2 Sulton Rd., Webster, MA 01570
Hamworthy Marine, Inc., 1129 Hospital Dr. Ste 3C, Stockbridge, GA 30281
Marine Electric & Process Control, 3931 Leary Way NW, Seattle, WA 98102
Kraiss Co., 299 Williams Avenue, Hackensack, NJ 07061
Uja Motivator, 566 Parker St., Newark, NJ 07104

PURIFIERS

American Ship Repair, 1011 38th St., Brooklyn, NY 11219

RADARS —ARPAS

Funuro USA, Inc., 271 Harbor Way, S. San Francisco, CA 94080
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017

REFR COMPRESSORS

CMF Corporation, P.O. Box 15199, Oklahoma City, OK 73155

REFRIGERATION COMPRESSOR REPLACEMENT PARTS

CMF Corporation, P.O. Box 15199, Oklahoma City, OK 73155

REGULATORY DATABASES

Solutions Software, 1825 Turlehill Rd., Enterprise, FL 32725

REPLACEMENT TRENDS

Washington Aluminum, 1330 Knecht Ave., Baltimore, MD 21229

RH PROPULSION

Boil Filter, 15 International Dr., East Granby, Ct., 06206
G o ll ens, 1 6 0 Van Brunt St., Brooklyn, NY 11231

RIGID INFLATABLE BOATS

Willard Marine, Inc. 1250 N Grove St., Anaheim, CA 92806
Zodiac of N. America Thompson Creek, P.O. Box 400, Stevesville, MD 21666

RISK MANAGEMENT

BL Trinity Group, 17 State Street 16th Fl., New York, NY 10004

ROPE—Manila—Nylon—Hawes—Fibers

Cortland Cable Co., 44 River St.(PSR), Cortland, NY 13045-0330
Phyllystan, Inc., 151 Commerce Drive, Montgomerieville, PA 18936-9628
Puget Sound Rope, 1012 Second St., Anacortes, WA 98221
Pelican Rope Works, 4001 W.Canage Way, Santa Ana, CA 92704
Rasmussen Equipment Co., P.O. Box 81206, Seattle, WA 98108

ROTATING EQUIPMENT

FCS, Inc., 22 Main Street, Centerbrook, CT 06409

ROV/LIGHTS/CAMERAS

Deep Sea Systems Intl., P.O. Box 622, Falmouth, MA 02541

RUBBER FLOORING

Tuflex, Inc. 4521 West Crest Ave., Tampa, FL 33614

RUDDER BEARINGS & BUSHES

Duramax Marine, 16025 Johnson St., P.O. Box 67, Middlefield, OH 44062-0067
Thorlon Bearings, Inc., 3225 Mainway, Burlington, Ontario Canada L7M 1A6

SAFETY PRODUCTS

Brookdale International, 1-8755 Ash St., Vancouver BC, V6P6T3
MGI International, Ste. 113-980 West 1st Street
N Vancouver, BC CANADA V2P 3n4
Viking Life Saving, 1625 N. Miami Ave., Miami, FL 33136
New England Marine & Industrial, 200 Spaulding Turnpike, Portsmouth, NH 03801
Nautical Safety Products, P.O. Box 590462, Houston, TX 77259
Norwegian Maritime Equip. AS, Box 244, NO-5460 Husnes, Norway

SANITATION DEVICE—Pollution Control

Alfa-Tec, Inc., 4027 21st Ave. West, Seattle, WA 98199
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Exceltech International Corp., 1110 Industrial Blvd., Sugarland, TX 77478
Envirovac Inc., 1260 Turrel Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
AlfaTec, Inc., 4027 21st Ave. West, Seattle, WA 98199
Microphor, 452 E Hill Rd., Willits, CA 95490
Owens Mfg., Hwy 92, Youngsville, LA 70592

SATOR

Motcom, 1500 Dundee Dr., Arlington Heights, IL

SATELLITE COMMUNICATIONS

Boatracas, Inc., 10675 Sorrento Valley Rd., Ste. 200, San Diego, CA 92121-1609
Funuro USA, Inc., 4400 N.W. Pacific Rim Blvd, Camas WA 98607
KVH Industries, Inc., 110 Enterprise Center, Middleton, RI, 02842-5268
ICG Satellite Communications, 8400 NW 52nd St., Suite 110, Miami, FL 33166
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27604-1851
Indium N.A., 8449 S River Pkwy, Tempe, AZ 85284
Norwegian Telecom, Postboks 6701 St. Olavs Plass, N-0130, Oslo, Norway
PTT Telecom, Station 12, P.O. Box 30150-2500 JD The Hague, NETHERLANDS
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
Raytheon Marine Co., 676 Island Pond Rd., Manchester, NH 03109
Singapore Telecom, 15 Hill Street, Telephone House, 2nd Storey, Singapore 0617
Telstra Mobile Satellite & Radio Services, 79 St. Hilliers Rd.,
Auburn NSW 2144, AUSTRALIA

MAGELLAN SYSTEMS

Magellan Systems, 960 Overland Court, San Dimas, CA 91773
Siralos, 150 Metcalfe St., Suite 1900, Ottawa, Ontario K2P 1P1 Canada
Consal Maritime Services, 6560 Rock Spring Drive, Bethesda, MD 20817-1146
Stalon 12, P.O. Box 30150, NL-2500 JD Den Haag, Netherlands

SCARIFIERS

Desmond-Stephan, P.O.B. 30, Urbana, OH 43078

SEALS

John Crane Marine, USA, 1536 Barclay Blvd, Buffalo Grove, IL 60089
Blohm & Voss Industries GmbH, P.O. B. 112289, D-2042 Hamburg 1, GERMANY
U.S.A. Repts: Simplex-Turmar Inc., P.O. B. 675, Tonawanda, NY 14151
Duramax Marine, 16025 Johnson St., Middlefield, OH 44062
Circle Seal Controls Inc., 2301 Wardow Circle, P.O. Box 3300 Corona, CA
Orkel Inc., 2535 Prairie Rd., Unit D, Eugene, OR 97402
Orkel Composites Ltd., Bradmarsh Business Park, Rotherham S60 1BX

SEATING

H.O. Bostrom Co. Inc., Progues Ave., Waukesha, WI
Blohm & Voss Industries GmbH, P.O. B. 112289, D-2042 Hamburg 1, GERMANY
U.S.A. Repts: Simplex-Turmar Inc., P.O. B. 675, Tonawanda, NY 14151
Duramax Marine, 16025 Johnson St., P.O. Box 67, Middlefield, OH 44062-0067
Thorlon Bearings, Inc., 3225 Mainway, Burlington, Ontario Canada L7M 1A6
Vesco Plastics, P.O. Box 40647, Cleveland 2022, South Africa

STERN TUBE BEARINGS/ BUSHES

HC Lagersmit, P.O.B. 5 - 2960 AA Kierdijk - HOLLAND
Blohm & Voss industries GmbH, P.O. B. 112289, D-2042 Hamburg 1, GERMANY
U.S.A. Repts: Simplex-Turmar Inc., P.O. B. 675, Tonawanda, NY 14151
Raiklo Ltd., Loudwater, High Wycombe, Bucks Hampshire ENGLAND HP109VQ
Duramax Marine, 16025 Johnson St., P.O. Box 67, Middlefield, OH 44062-0067
Kobel Manufacturing Co., Ltd., 8238 129 street, Surrey, B.C. V5Y1G3
Jastram Engineering, 485 Mountain Hwy N., North Vancouver,
B.C. CANADA V7J 2L3

STERN TUBE SEALS

Blohm & Voss Industries GmbH, P.O. B. 112289, D-2042 Hamburg 1, GERMANY
U.S.A. Repts: Simplex-Turmar Inc., P.O. B. 675, Tonawanda, NY 14151
Duramax Marine, 16025 Johnson St., P.O. Box 67, Middlefield, OH 44062-0067
HC Lagersmit, P.O.B. 5 - 2960 AA Kierdijk - HOLLAND
John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

STORAGE/WORKSHELTERS

Poly-Steel Shelters, 1209 E. Ocean Blvd., Stuart, FL 34996

STRAINERS

Kraiss Co., 299 Williams Ave., Hackensack, NJ 07061
Superbolt, P.O. Box 683, Carnegie, PA 15106

SURFACE PREP TOOLS

Advanced Environmental Systems, 2 Sulton Rd., Webster, MA 01570
Aurand Mfg., 1210 Ellis St., Cincinnati, Ohio 45223
NLR Corp., 29830 Beck Rd., Wixom MI 48393
Graco, Inc., P.O. Box 1441, Minneapolis, MN 55440-1441
Flow International Corp., 23500 64th Ave. S., Kent, WA 98032

TANK GAUGING SYSTEMS

FCS, Inc., 22 Main Street, Centerbrook, CT 06409

TANK LIQUID GAUGES

Technical Marine Services, 6040 N. Cutler Circle, Portland, OR 97217

TANK LEVELING INDICATORS

ERL Marine Products div, PO Box 1026, New Albany, IN 47151-1026
MMC International, 60 Inip Dr, Inwood NY 11096

SHIPBUILDING—Repairs, Maintenance, Drydocking

Amfels, Inc., P.O. Box 3107, Brownsville, TX 78523
Astilleros Espanoles, S.A. Ochandiano, 14-16 28023 El Planio SPAIN
Atlantic Marine, Inc., P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., 8500 Hecksher Dr., Jacksonville, FL 32226
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150
Bender Shipbuilding & Repair, P.O. Box 42, Mobile AL 36601
Bisso Marine Co., P.O.Box 4113, New Orleans, LA 70178
Blount Manne, 461 Water St., Warren, R.I. 02885
Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374
Cascade General Inc., 5555 N. Channel Ave., Bid. 71, Portland,
OR 97217
Chris-Marine AB, P.O. Box 9025, S-2000 39, Malmö, SWEDEN
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Eastern Shipbuilding Group, 2200 Nelson Street, Panama City, FL 32402
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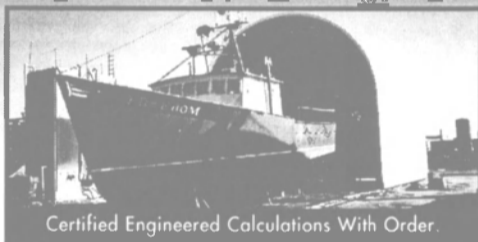


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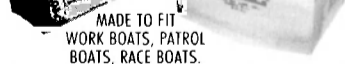
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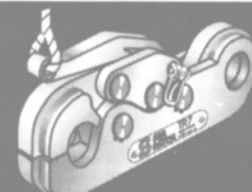
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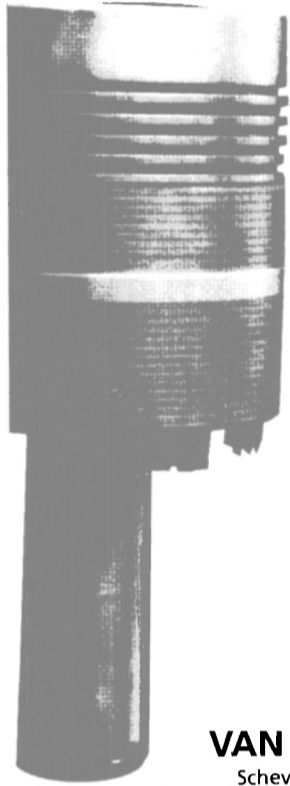
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Bachelor or Equivalent in Marine Engineering or related field req. +4 yrs experience in job offered or as Ship Engineer req. Chief Engineer's Marine License required. \$55,000 per year. 8 to 5, 40 hours per week. "Resume and/or cover letter must reflect each and every listed requirement or it will be rejected." Submit resume to:

Employment Department
Attn: Job Order #5552019
875 Union Street N.E., Room 201
Salem, OR 97311

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Carry out inspections regarding electrical electronic control systems; Test electrical and electronic systems, all according to customer's specifications for a particular ship, including U.S. Coast Guard ships. Must have 10 years in job offered or 10 years experience as Electrical Engineer in Shipbuilding Industry. Must pass physical and drug screen. Two years experience as electrical engineer in shipbuilding industry must include work with United States Coast Guard ships. \$52,520.00 per year, 45 hours per week, 7:00 a.m. - 5:00 p.m. Contact:

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Attn: HR Dept - J
Fax: (972) 701-7945
e-mail: mdenkowski@sfdri.com

PLANNING MANAGER

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International marine society seeking experienced Publications Manager at headquarters office in Jersey City to create, lay out and design one quarterly magazine and a bi-monthly electronic newsletter using Quark Express and Adobe PhotoShop in a PC environment. Must also manage the production of two other journals and annual transactions in both electronic and printed format. Knowledge of printing, production, electronic file transfer and publication on web site necessary. Ability to work independently in a fast-paced, deadline oriented environment and coordinate with staff of 20, society volunteers and committee structure desirable. Knowledge of marine industry and technical language a plus. Generous benefits and pleasant working surroundings in Jersey City. E-mail resume and salary requirements to:

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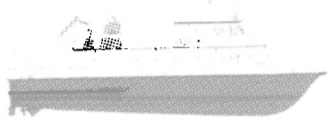
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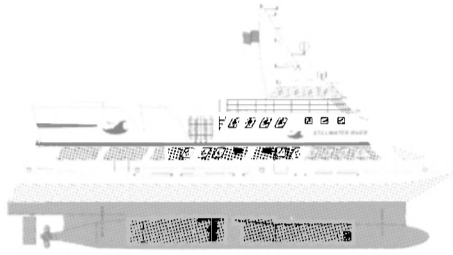
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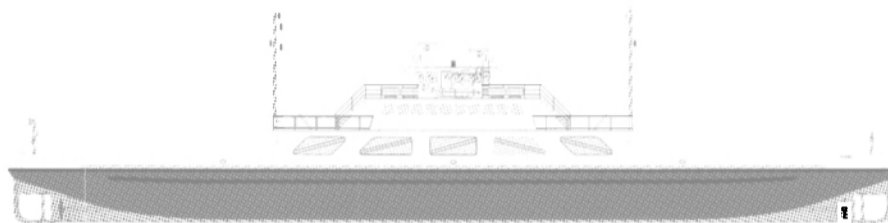
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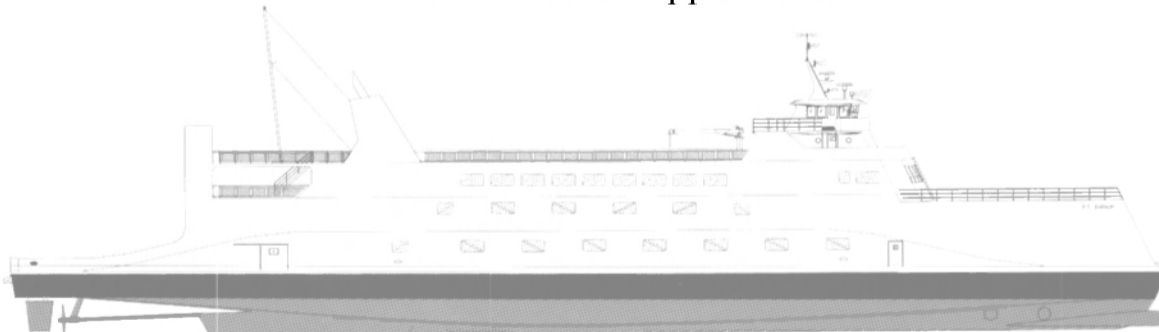
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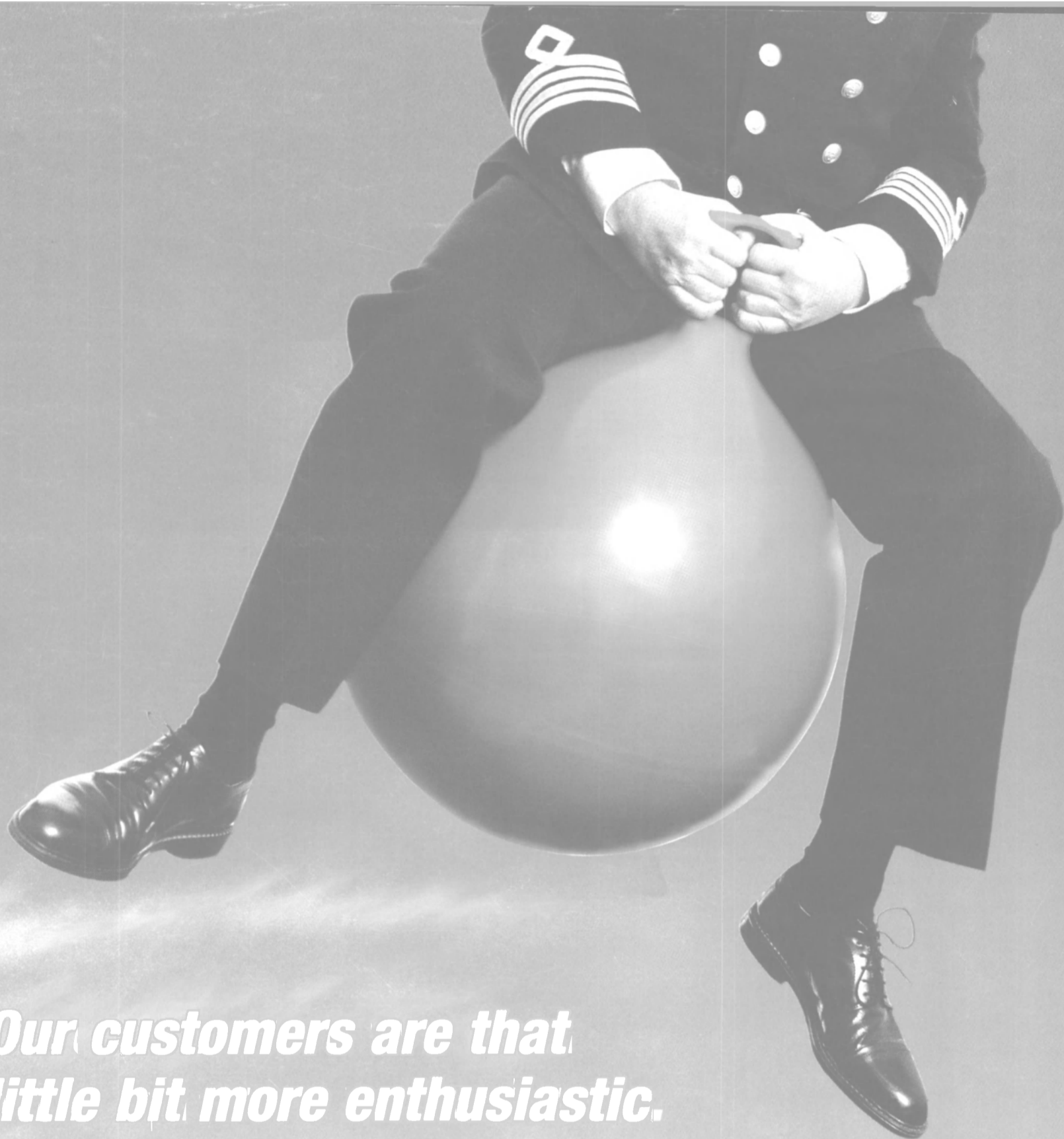
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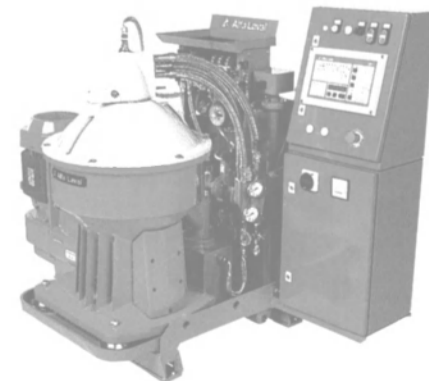
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