

November 1999

MARITIME REPORTER AND ENGINEERING NEWS

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The Workboat Race Is On

New technologies, emerging markets
continue to drive workboat innovation

Marine Electronics

Cosco makes 500-ship fleet a marine electronics role model

Floating Production Systems

Market to expand up to 66% over next 5 years

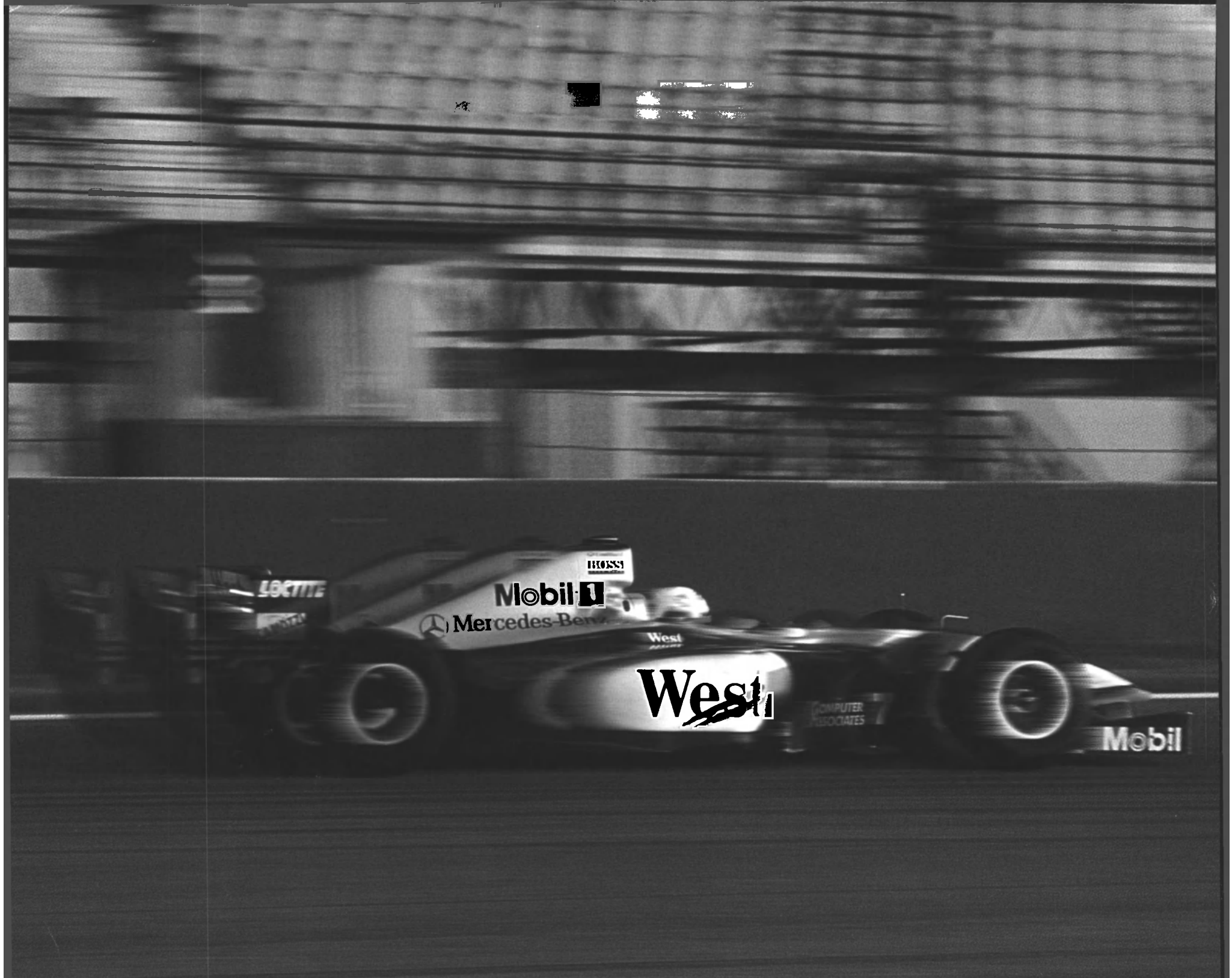
Cruise Industry Report

Safety issues top industry's agenda



U.S. Coast Guard Deepwater Project Gains Clout

Ferlship's New Ship Contracts • Bunker Fuel Quality Report • Europort '99 • Software Solutions
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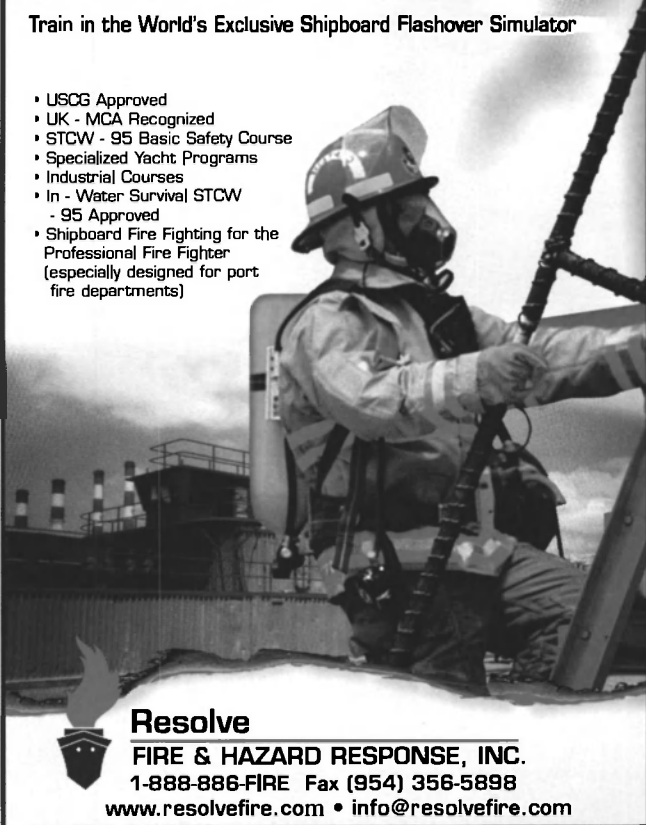
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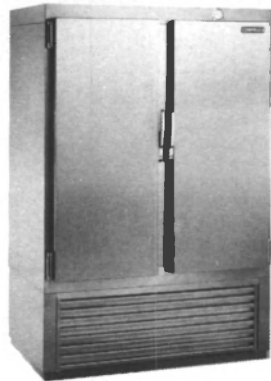
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No. 11

Vol. 61

Founder: John J. O'Malley 1905 - 1980

On the Cover: Technological advances on workboats of all size, configuration and type have helped to drastically improve safety and efficiency. Pictured on this month's cover — which was supplied by Crowley Marine — is an action shot from the Seattle tug race. Workboat coverage begins on page 42.

8 Challenging the norm

Norwegian classification society Det Norske Veritas has again helped to raise the quality bar one notch higher, helping to establish a "virtual shipyard" in Poland.

16 Emerging markets

A recent International Maritime Associates report reasons that the floating production system segment is set to grow between 48 and 66 percent in the next five years.

28 The Cruise Conundrum

Cruise shipping companies — which have been riding an all-time high — have gotten several doses of bad publicity via accidents and mishaps. The question: how will legislators respond?

- 31 Cruise industry magnate and industry innovator **Ted Arison** has died.
- 36 Silversea — with new ships and new management — is positioned to prosper.
- 38 **Buy Now!**: Lazard Freres & Co. reasons that a cruise industry investment is smart money.

42 Workboat '99

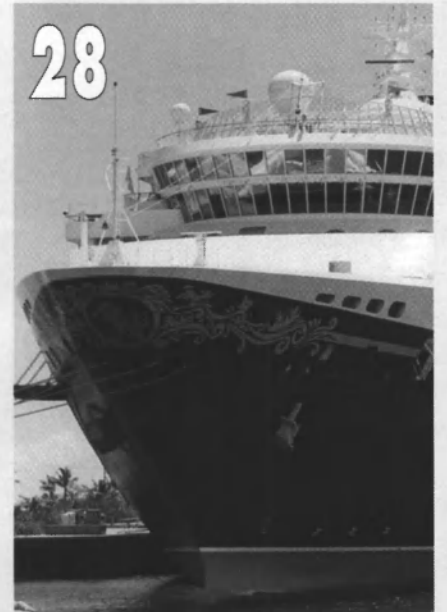
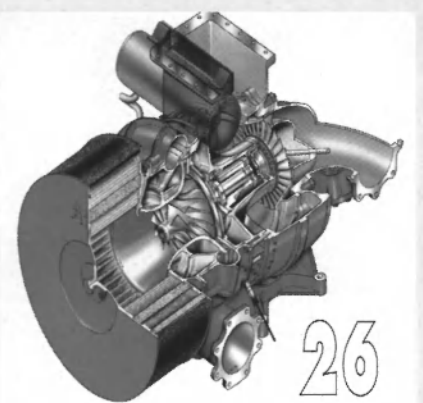
While Gulf of Mexico area companies are not yet ready to dub the recent oil run up as a "boom," optimism is high that sustained prices will bolster business in 2000 and beyond.

- 46 **A Cut Above:** Much investment has been made in GOM yard's steel processing capabilities.
- 49 **Catch the Wave:** First Wave/Newpark's amazing transformation continues.

60 Marine Electronics

Cosco has invested heavily to ensure its 500+ fleet features the best electronic innovations.

- 4 Letters to the Editor
- 10 **Marine Finance** Seacor Smit weighs in with 3Q results.
- 12 **Contracts**
- 23 **Propulsion Updates** MAN launches new propulsion package; ABB debuts new turbocharger technology.
- 40 **Products & Services Guide**
- 58 **Europort '99**
- 74 **Marine Engineering** CIMAC reports on Oil Consumption of Medium Speed Diesel Engines.
- 76 **U.S.C.G.:** The Deepwater Project picks up steam.
- 113 **Buyer's Guide**
- 116 **Advertiser's Index**
- 117 **Classified/Professional Advertisements**



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MADE TO MEASURE

Letter to the Editor

The article entitled, "Go to the Head of the Class" (*MR/EN*, Sept. 1999) presents a refreshing example of progress in maritime education. Professors Femenia and Butman of the United States Merchant Marine Academy (USMMA) are to be commended for developing a Shipyard and Marine Management Program that is responsive to the needs of the maritime industry, and one that exemplifies the synergy of education and industry working together. I

commend NASSCO and Atlantic Marine for their participation as mentors, providing internship opportunities that successfully foster the goals of the program. Their investment in the program appears to be paying off.

A few years ago I was invited by Prof. Butman to participate in the program as an "industry consultant," making several presentations to the midshipmen on port engineering topics, and providing guidance to a group of students during the preparation of their Capstone project. At the

conclusion, I was invited to attend the project presentations along with other industry professionals. The presentations were impressive and a sure sign that the program would be successful. From a professional standpoint, I found the entire experience to be both rewarding and enjoyable. The following summer I arranged for two midshipmen to intern with my port engineering staff during a major ship overhaul. Both midshipmen participated in the routine (and non-routine) tasks of the overhaul manage-

ment function, and they did an outstanding job, learning first-hand the job of running a major overhaul from a shipowner's perspective.

I encourage shipyards, shipowners/operators and maritime professionals alike to support this program, either as mentors or to facilitate relevant internship opportunities for the midshipmen. This program certainly provides a win-win situation for both the students and the industry.

*Richard Thorsen, PE,
ACTA Maritime*

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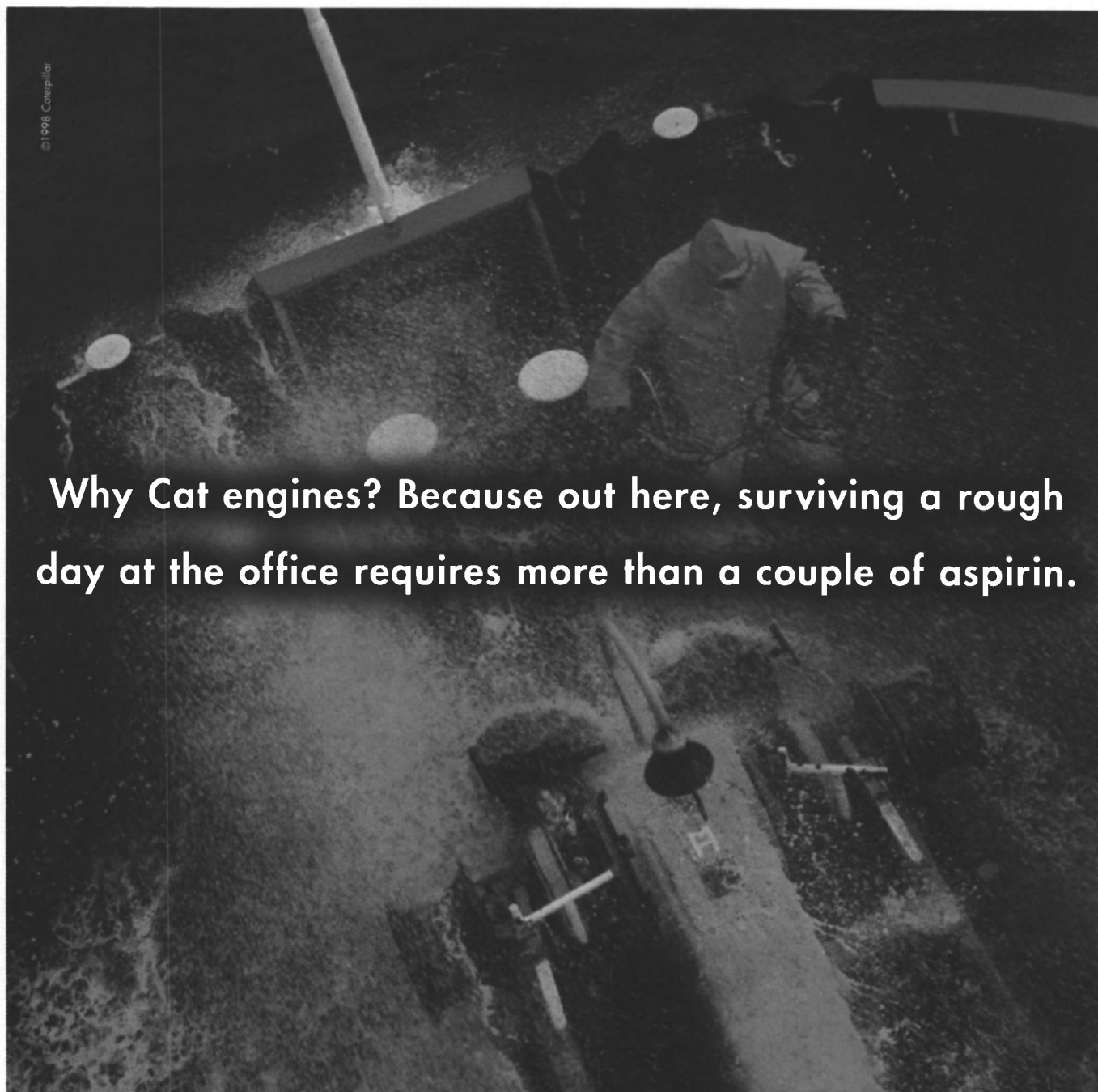
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EDITOR'S NOTE

The year 1999 could arguably be counted as one of the more tumultuous for the maritime industry in the past half-century. Collectively, a series of related and non-related events — from continuing financial fallout from the Far East to roller coaster-like oil prices to corporate consolidation to high-profile casualties — have conspired to effectively change the face of the marine and offshore markets for some time to come.

Some high-profile mishaps in the red-hot cruise market have seemingly done little to nothing to dampen the appetite for new ships, but — as covered in both this month's cruise ship coverage and marine electronics coverage — the resultant legislative ramifications could indeed change the way in which ships are designed, built, outfitted and operated in the future. The IMO, USCG and U.S. Congress have all had their voice heard on the matter in recent months (See "They Said It" below), and it's a good bet that today's investigations will turn into new standards placed in the pipeline early on in the next decade.

For all types of vessels, however, safety of vessel, crew and environment continues to push its way to the top of most agendas. More than ever, ship and boat owners and operators will rely on marine innovations from marine equipment suppliers — particularly those in the realms of propulsion and electronics — to ensure that vessels are operated and maintained in a proper manner. The new guidelines for emissions from marine diesel engines will continue to challenge both supplier and owner alike, to incorporate the changes while maintaining the bottom line. Advances in marine electronics, particularly the advent of electronic charts, are sure to come flying off the shelves and into bridges at a quickening pace.



Greg R. Franthum

They Said It

"I believe that continued failure by the international cruise industry to abide by all U.S. and international laws and regulations for operation in and out of our ports and to meet high standards with regard to passenger safety and well-being will result in action to restrict access, not expand it. I challenge them to improve their operations and warn them that if they don't, the Congress will act." — Senator John McCain, Chairman of the Senate Committee on Commerce, Science and Transportation.

"The changes that lie ahead of shipping in the new millennium are enormous ... we cannot let events unfold, and then respond to ensuing disasters. We have to prevent them from happening in the first place." — William O'Neil, secretary-general of the International Maritime Organization

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January 2000
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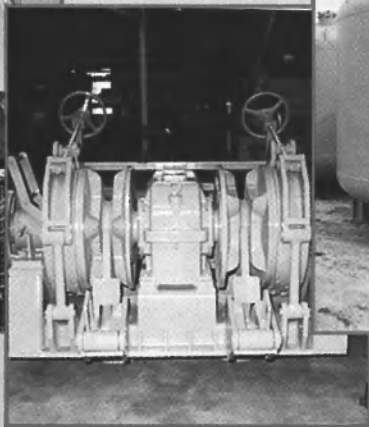
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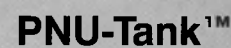
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Virtual Yard = Real Business



by David Tinsley,
technical editor

As a fitting recognition of Poland's evolving shipbuilding tradition and solid, maritime technical skills, a development dubbed the 'virtual shipyard' has been established in Gdansk by Det Norske Veritas (DNV). The classification society's reinforced technological commitment to Poland has also been encouraged by the competitive environment which now exists there, and which has fired the transitional economy. DNV's move taps an abundant resource of naval architects and endorses the maritime infrastructural role played by the Technical University of Gdansk, where the Norwegian classification society has set up its Nauticus Modelling Center (NMC).

The objective with NMC is to ensure the efficient production of 3-D graphical models (3DGM) in line with the society's move towards the use of dynamic product models for classification purposes, spanning a ship's lifetime. The

concept of the virtual shipyard, or NMC, is thereby central to future classification operations, applying all the society's amassed knowledge and specific ship information data in a single product model.

For the client market in the shape of shipowners and shipbuilders, DNV's investment initiative promises improved efficiency as regards access to requisite information. The 3DGMs are prepared using the Nauticus digital platform developed by the Norwegian organization, and the product model supports the new Nauticus class notation.

A small team of information technology (IT) personnel at DNV's Hovik headquarters supports the staff at Gdansk, made up primarily of naval architecture graduates from Gdansk Technical University, with a core of experienced naval architects drawn from the local shipping industry.

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Potent plant

Wide cylinder bores are not without precedent in the medium-speed engine domain, to which the Stork-Wartsila (nee Stork-Werkspoor) TM620 was testament. But the Wartsila 64, now going to sea for the first time in a German-built shortsea containership, marries an unprecedented power concentration in a single, medium-speed prime mover. An 11,600-dwt newbuild for Hans-Peter Wegener from the Sietas establishment at Hamburg-Neuenfelde marks the marine operational debut of the Finnish-developed engine, which offers a potent delivery of around 2-MW per cylinder at its nominal rating. Although derated for the 954-TEU German boxship installation to 12,600-kW, the seven-cylinder plant is still expected to ensure a highly competitive service speed of 20.5-knots.

Compared with the Dutch-engineered TM620, the Wartsila 64 has much longer

"legs," by way of a 900-mm cylinder stroke, in addition to a wider, 640-mm bore. The initial seagoing recipient of the new class of diesel has been assigned charter to the Finnish company Containerships Oy, for its regular link between Helsinki, Rotterdam and Teesport. The entire series of multipurpose containerships ordered from Japanese and Polish yards by Dutch operator Spliethoff's has also been specified with the Italian-manufactured 64 engine, in six-cylinder layout. A 12-cylinder vee engine has been operational ashore for some time, as part of a new, combined-cycle power station in Finland.

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Seacor Smit Announces Third Quarter Results

Seacor Smit Inc. announced net earnings for the third quarter ending Sept. 30 of \$5 million on revenues of \$71.9 million. Results for the quarter included a charge of \$2.6 million for additional income tax expense related to the company's decision to liquidate a foreign joint venture, and an extraordinary gain of \$890,000 relating to the early retirement of debt. In the same period a year ago, Seacor earned \$26.4 million, on revenues of \$100 million.

Results for the quarter ending Sept. 30 included a loss of \$789,000 related to Seacor's investment in Globe Wireless LLC that is accounted for under the equity method. Results for the quarter also included a loss of \$347,000 related to its investment in a majority-owned subsidiary, Chiles Offshore LLC. As a result of swap agreements entered into by the company with respect to senior notes issued by Chiles, the company's interest expense was reduced by \$397,000 in the current quarter.

For the nine months ending Sept. 30,

net earnings were \$24.8 million on revenues of \$218 million.

Results for the period included a loss of \$1.1 million related to Seacor's investment in Globe Wireless. In the same period a year ago, net earnings were \$96.7 million on revenues of \$293 million.

Results for the three- and nine-month periods ending Sept. 30 included net gains from equipment sales of \$554,000 and \$1.2 million. In the same periods a year ago, net gains from equipment sales were \$2.4 million and \$24.7 million.

Seacor Smit and its subsidiaries engage in: the operation of a diversified fleet of marine vessels primarily dedicated to supporting offshore oil and gas exploration and development in the U.S. Gulf of Mexico, offshore West Africa, the North Sea, Mexico, the Far East, Latin America, and the Mediterranean; and provision of environmental services domestically and internationally, including marine oil spill response, training and consulting.

	Three Months Ended Sept. 30		Nine Months Ended Sept. 30	
	1998	1999	1998	1999
Rates Per Day Worked - Worldwide (\$):				
Supply and Towing Supply	6,296	5,130	6,712	5,655
Anchor Handling and Towing Supply	12,724	12,011	12,151	11,989
Crew	2,726	2,455	2,711	2,511
Standby Safety	6,700	5,677	6,561	6,055
Utility and Line Handling	1,991	1,632	1,908	1,706
Geophysical, Freight and Other	7,288	5,880	6,109	5,488
Overall Utilization - Worldwide (%):				
Supply and Towing Supply	89.4	67.1	90.7	70.6
Anchor Handling and Towing Supply	90.3	80.0	87.4	76.5
Crew	90.7	84.6	95.0	80.2
Standby Safety	100.0	76.3	99.4	79.3
Utility and Line Handling	90.5	66.5	94.1	67.9
Geophysical, Freight and Other	99.9	50.0	100.0	57.5
Fleet Composition at Period End:				
Supply and Towing Supply	-	-	80	80
Anchor Handling and Towing Supply	-	-	38	32
Crew	-	-	80	79
Standby Safety	-	-	22	20
Utility and Line Handling	-	-	84	83
Geophysical, Freight and Other	-	-	4	3
TOTAL			308	297



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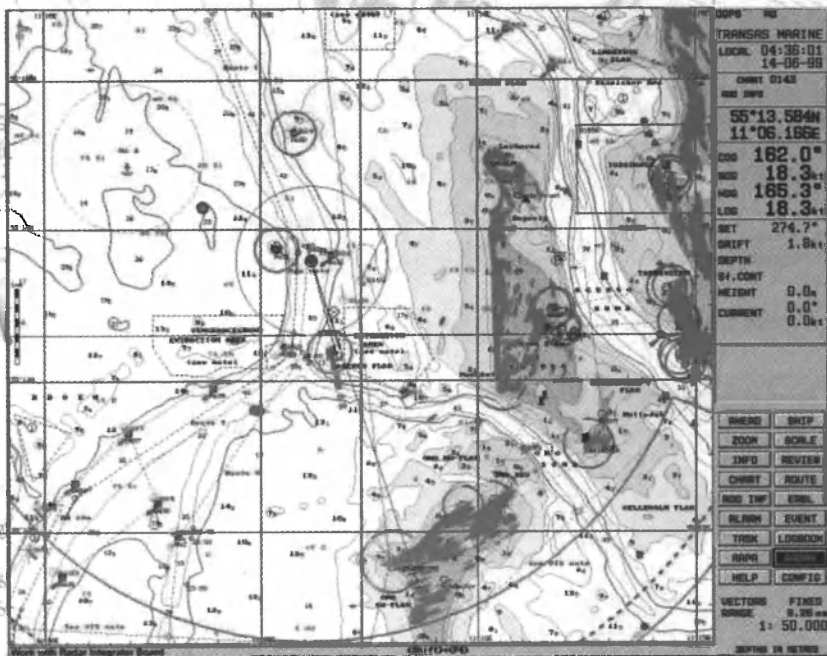


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Contracts

FastShip Selects Gear Corporation As Supplier

FastShip, Inc. has reached an agreement with Philadelphia Gear Corporation to supply sophisticated transmission equipment for the company's high-speed trans-Atlantic fleet. The \$35 million order is the largest in Philadelphia

Gear's 100-year history, bringing more than 100 direct and indirect jobs to the region.

Per the agreement, Philadelphia Gear will supply 20 gearboxes — five in each of FastShip's initial four vessels — plus one spare gearbox and additional parts, as well as a 10-year service maintenance package. Philadelphia Gear will also

participate in vendor financing of FastShip, which intends to complete its total financing package by year-end 1999.

The gearboxes will link the five Rolls-Royce marine Trent engines to Kamewa water jets, delivering a total of 250 MW or 335,000-hp.

This propulsion package will enable the 860 ft. (262 m) vessels, carrying a

10,000-ton payload, to complete the passage from Philadelphia to Cherbourg in less than four days while sustaining speeds up to 40 knots.

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Vosper To Enter Negotiations For Fast Attack Craft



Vosper Thornycroft (VT), has been selected to enter contract negotiations with Elefsis Shipbuilding and Industrial Enterprises for the supply of three 203 ft. (62 m) fast attack craft to the Hellenic Navy. With negotiations beginning soon, work is expected to start early next year with VT providing design, construction support and the ship's equipment to Elefsis in a contract worth about \$331 million.

The initial requirement is for a trio of craft with a possible follow-on order of at least four vessels.

R&B Falcon Drilling Receives Letter Of Intent

R&B Falcon Drilling has received a letter of intent from Petroleo Brasileiro S/A Petrobras for a two-year contract for the DP drillship Deepwater Frontier for operations offshore Brazil in up to approximately 8,900 ft. (2,712 m) of water. Capable of drilling in up to 10,000 ft. (3,048 m) of water, Deepwater Frontier is 60 percent owned by R&B Falcon Corp. and 40 percent by Conoco. The vessel will sail to Brazil upon completion of its current one-well commitment in West Africa, with operations for Petrobras expected to begin in November 1999. These two projects will essentially complete all of R&B Falcon's 2.5 year drilling contract obligation with respect to the Deepwater Frontier pursuant to the rig sharing agreement with Conoco.

Keppel Fels Repairs Tam Dao Drilling Rig

Keppel Fels Limited has completed its \$10 million contract with Vietnam-Russian joint venture company Vietsovpetro for the repair of jack up drilling rig Tam Dao.

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by Keppel in 1988 and has since been operating in Vietnam with positive commercial returns for the owner/operator. Keppel performed the last repair on Tam Dao in 1992.

Per the contract, Keppel Fels overhauled the rig's main generators, repaired its blowout preventer (BOP) units and jacking structures. The company also replaced some of the rig's drilling equipment, as well as refurbishing its existing derrick. Tam Dao's electrical, piping, automation and electronic systems were also repaired; drydock work consisted of hull painting.

Litton Wins Sub Radar Contract For U.S. Navy

Litton Marine Systems has been granted a contract worth more than \$7 million by Naval Sea Systems Command, Arlington, Va. to provide radars for U.S. submarines.

The contract calls for Litton to supply three AN/BPS-16(V) radar and mast systems, providing navigation and surface surveillance. The trio of systems will be outfitted on USS Jimmy Carter, third Seawolf Class submarine; and New Attack submarines USS Virginia and USS Texas.

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Alstom Wins Repeat Order For Cable Layer

The Marine and Offshore division of Alstom Drives & Controls has been awarded a contract by James Fisher & Sons to provide a replacement power management, alarm and monitoring system for installation on the C/S Nexus cable layer.

This is the second such order for Alstom from James Fisher, who granted the company a contract in 1993 for the supply and installation of a DPS901 Simplex Dynamic Positioning System onboard the same vessel.

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Oceaneering Preferred As Production Unit Provider

Oceaneering International has been selected as the preferred contractor to provide a mobile offshore production unit (MOPU) for development of the Legendre North and South oil fields located in WA-1-P in Western Australia.

The company is expected to commence work to convert its jackup Marine 7 to serve as the Legendre MOPU at a capital cost ranging between \$75 and \$80 million.

Installation of the unit, which is equipped with production process and gas injection facilities, will occur off-

shore Western Australia in December 2000.

Rolls-Royce Subsidiary To Supply Shiplifts

Syncrolift, a subsidiary of Rolls-Royce plc, will supply two new Syncrolift shiplift and transfer systems in the

Middle East to upgrade efficiency and profitability in shipyard repair and overhaul activities. With a combined value of more than \$7 million, the contracts will expand the company's presence in the Middle East region.

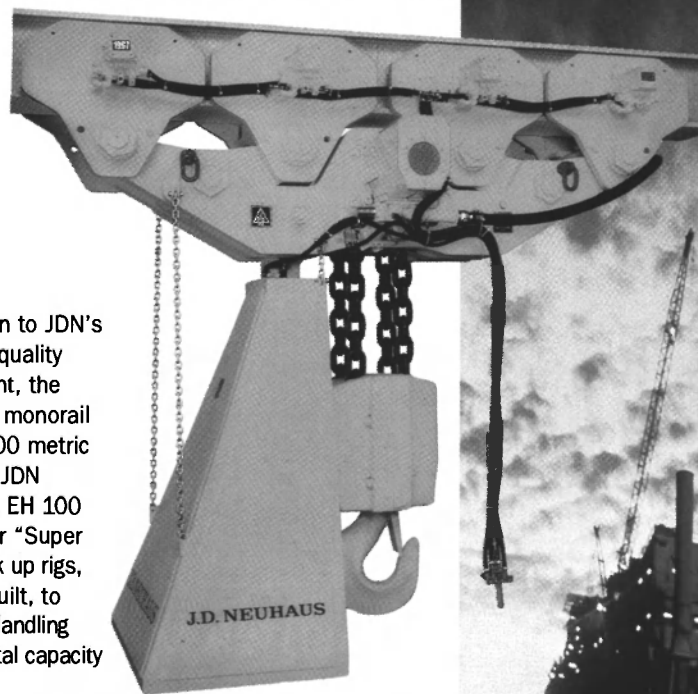
A 3,090-ton-lift-capacity Syncrolift will be added to Abu Dhabi ShipBuilding's (ADSB) facilities in Musaffah,

United Arab Emirates, increasing the company's lifting capacity by six times. Using 12 325-ton capacity Syncrolift hoist assemblies and a two-level transfer system, the shiplift will serve five dry work berths, allowing ADSB to increase its throughput of shipbuilding and repair work.

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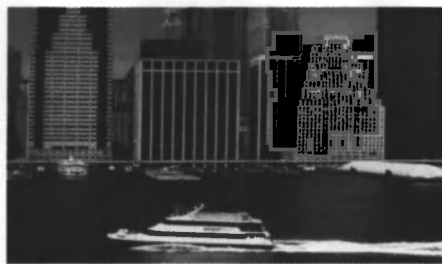
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Contracts

Deutz To Repower For Hydrolines

Deutz Canada has received an order for two TBD 620 V12 to repower Hydrolines catamaran Express II operated by Seastreak. Rated at continuous output of 1,524 kW (2,072-hp) at 1,800



rpm, the engines are driving fixed pitch propellers.

Hydrolines also repowered Express I this May with a pair of TBD 620 V12. In conjunction with Seastreak, the company has awarded Deutz Canada the contract to repower its second vessel.

Circle 86 on Reader Service Card

Transmarine Receives Order From Ferguson

Transmarine Ltd has been granted the contract to design and supply a hydraulic end folding hatch cover with coamings for Ferguson Shipbuilders' newbuilding Ship No. 709. Scheduled for completion in February 2000, Transmarine will supply a fully equipped hatch cover and coamings for the Navigation Tender ordered by the Northern Lights Board. The hatch cover provides access into the vessel's hold, which is used for navigational buoy stowage. Constructed with flat top plates and an open web construction, the covers are designed to stow forward when open.

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NASSCO Named Prime Contractor

National Steel and Shipbuilding Company (NASSCO), a General Dynamics company, has been appointed the prime contractor on \$17.4 million in research and development contracts awarded by the Maritech Advanced Shipbuilding Enterprise (ASE) program. In addition to Maritech awarded funds, industry participants will invest \$23.5 million of their own funds in the projects for a total cost of \$40.9 million. Leading a team of U.S. shipbuilders, marine design and technology firms and universities on two-three projects for the construction of Navy and commercial ships, NASSCO will receive about one-half of the R&D award amount.

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Horizon To Construct ISTT

Horizon Shipbuilding was awarded a contract to construct a series of 30 ft. (9 m) fiberglass Improved Surface Tow Targets (ISTT) for the U.S. Naval Air Warfare Center, Weapons Division in Point Mugu, Calif. According to Horizon's president, **Travis R. Short**, the total contract calls for the delivery of more than 30 units throughout the next two years to be built at the company's facility in Bayou La Batre, La.

Conoco Extends FPSO Contract

Conoco Indonesia has extended the charter of FPSO San Jacinto for an additional year at the Sembiland field, Block B, Indonesia, according to Oceaneering International. The vessel has been at Sembiland since 1994 with the contract extension allowing it to remain until October 2000. Under contract to Conoco since its initial installation at Kepiting field in 1986, the FPSO was recently drydocked for steel and process plant repairs.

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Bossier Retires, Kitchen Takes Avondale Helm

Litton Industries announced that **Thomas M. "Tom" Kitchen**, a member of the Litton Avondale Industries management team, has been named president of Avondale to succeed **Albert Bossier**, age 67, who is retiring Nov. 1, 1999, after 42 years of service to Avondale.

"Tom Kitchen has played an integral role in the overall success of Avondale since joining the company in 1977," said **Jerry St. Pe**, Litton executive vice president and COO of Litton Ship Systems (LSS). "His selection from within Avondale reflects the strength, depth and expertise present in the current Avondale management team." Kitchen, age 51, joined Avondale in 1977 as an assistant controller. He has advanced through a series of assignments, culminating in his current duties as vice president and CFO. A New Orleans native, he holds a bachelor of science degree in accounting and master of business administration degree from the University of New Orleans.

Kitchen is a certified public accountant, and is a member of the Louisiana Society of CPAs, the American Institute of CPAs and the Financial Executives Institute.

Litton Ship Systems, which includes Avondale and Ingalls Shipbuilding in Pascagoula, Miss., has combined revenues of approximately \$1.8 billion in the shipbuilding and ship modernization market.

With its 17,000 employees, LSS is one of the nation's leading providers for the design, engineering, construction and life cycle support of major combatant vessels for the U.S. Navy, international navies and commercial customers.

O'Reilly To Succeed Derr As Chevron Chair And CEO

Vice chairman **Dave O'Reilly** has been elected chairman of the board and CEO of Chevron per the company's board of directors, effective January 1.

O'Reilly will succeed **Ken Derr** who has decided to retire after serving more than 40 years with the company, including 11 years as chairman and CEO.

Dick Matzke, a member of the board of directors and president of Chevron Overseas Petroleum, will succeed O'Reilly as vice chairman, responsible for worldwide exploration and produc-

tion operations, while **John Sullivan** continues as vice chairman responsible for worldwide refining, marketing and chemical operations.

Crowley To Form New Subsidiary

Crowley Maritime Corp. said that

upon the sale of its South American liner services to Hamburg Süd, it will operate its remaining Caribbean and Latin American services under a new name — Crowley Liner Services.

The wholly owned subsidiary of Crowley Maritime will be divided into two separate operating units, Crowley Liner Services - Puerto Rico/Caribbean

and Crowley Liner Services - Latin America.

The company has established a revised target date of November 1 for the sale of its South America liner services to Hamburg Sud who will continue to operate the South America services under the Crowley American Transport brand name.



Albert Bossier



Jerry St. Pe



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Outlook for Floating Production Systems

The strong and sustained rebound in the price per barrel of oil, coupled with the economic recovery in Asia has offshore production related companies

planning for a big 2000. Following is a synopsis of a report generated by Washington, D.C.-based International Maritime Associates Inc. which assesses the

market outlook for FPSO vessels, production semis, TLPs and spars.

There are currently 107 floating pro-

duction systems in operation worldwide, which is an increase of nearly 67 percent over the inventory reported in International Maritime Associates' report dated September 1996. In real terms, the increase means the addition of 49 units, broken down as such: 3 TLPs, 2 mini TLPs, 33 FPSO vessels, 9 production semis and 2 production spars.

Another 54 floating storage vessels (without production capability) are currently in operation. This figure includes nine units delivered since September 1996, two of which are used for LPG storage. Orders are currently in hand for 21 floating production and five storage systems. This total is two fewer production units and one less storage unit than reported in the March 1999 update, reflecting the slowdown in offshore activity over the past 18 months. Delivery of the units now on order will increase the inventory of floating production systems by 20 percent.

International Maritime Associates has identified 209 floating production systems currently being planned are under study. These are known projects where a floating system is being considered as the production solution. Some of these are in the advanced design stage — some are at an early stage of consideration. Proceeding with individual project will hinge on the economics of the dis-



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Floating Production

Systems are to increase 48 to 66 percent between 2000 and 2005

covery, which in turn will be influenced by the expected price of oil and project development cost. Not all will materialize, and in some cases, another production solution will be selected. And there are undoubtedly other projects in the planning and study phase where information has not yet been publicly released.

The current list of projects being planned or under study is a substantial increase over the 188 projects identified in the March 1999 report, which seems to indicate that interest in projects involving floating production continues to be strong, despite the downturn in actual orders over the past several months. The Gulf of Mexico again heads the list with 52 projects, the biggest increase in planned projects since the March 1999 report. West

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Offshore Report

Africa is second to the Gulf of Mexico with 46 floating production projects planned or under study. The North Sea is third with 41 projects, followed by Southeast Asia, Brazil and Australia. (See Chart 3)

Investment In 2000 and Beyond

The price per barrel of oil has steadily

marched upward since earlier this year, driven primarily by the recovering economies in Asia and the output quotes enacted and strictly adhered to by OPEC nations. As the price of oil stabilizes, investment budgets for exploration and development should proceed upward as well. According to International Maritime Associates, recent developments

are beginning to positively impact E&D. For example, it notes that:

- Conoco will increase capital spending in 2000 to about \$2.4 billion from \$1.8 billion in 1999, contingent upon a \$17 to \$18 price per barrel. Drilling activity has increased at Conoco in recent months, and several rigs are

undergoing or planned for re-activation.

- Salomon Smith Barney, in its mid-year report, said a record number of survey respondents plan to increase E&P expenditures in 2000. According to the survey, 73 percent of the participants said they plan to increase capital spending next year, and 65 percent said they expect E&P in 2000 to increase more than 10 percent.

- According to Offshore Data Service, the number of rigs working on turnkey wells in the Gulf of Mexico has risen to levels not seen for more than a year.

- Global Marine reports that day rates for offshore rigs increased 1.5 percent in July over the preceding month, following a steady decline during the preceding 14 months. Semisubmersible rates increased 2.6 percent; jack-ups .3 percent.

In addition, the market value of oil service company stocks are clearly back in favor as well. Major drilling companies have seen their stock price increase 75 to 175 percent since March, and analysts have been upgrading many of the companies. Another indicator of the more positive mood in the sector in the increase in inquiries to construction companies to resurrect and update proposals on offshore projects that have lain dormant for 12 to 18 months.

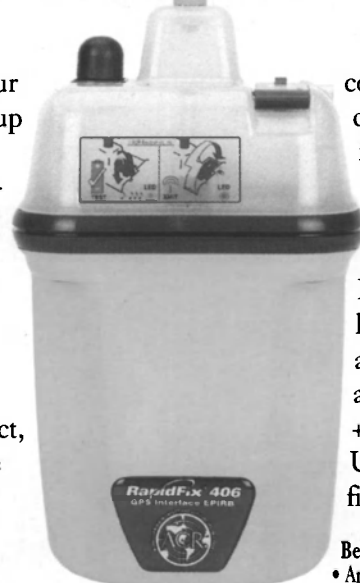
While the prediction of the course of oil pricing is part art, part science, there are currently no indicators, which would suggest a downturn by the end of the year, beginning of 2000. The principal threat in the short term is an unraveling of the producer's cutback agreement, which is considered unlikely given all of the pain endured worldwide during the previous 18-months' downturn. International Maritime Associates sees the cutbacks staying in place — if not relaxed a bit — but not abandoned before March of 2000. Other potential threats include an unraveling of the world economy from some economic shock, such as a major devaluation of the Chinese Yuan; military confrontation between China and Taiwan; or a total collapse in Russia that draws in its neighbors.

Longer term, there remains a threat that production capacity in low cost fields could be significantly increased, particularly if upstream activity in the Middle East is opened to the oil majors. Increased land-based production — particularly given its much lower production costs — continue to be a threat to the future of offshore production, but evolving technologies which continue to lower the cost of offshore production

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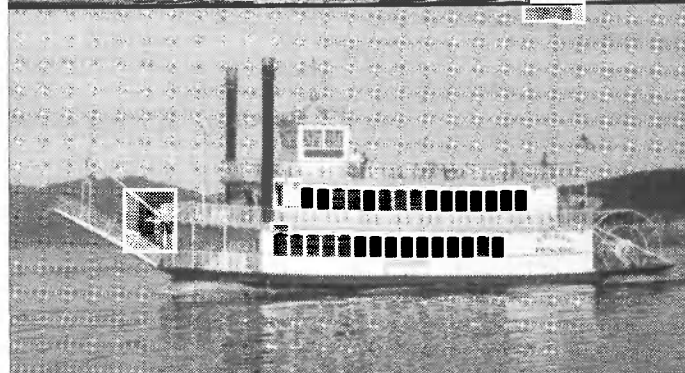
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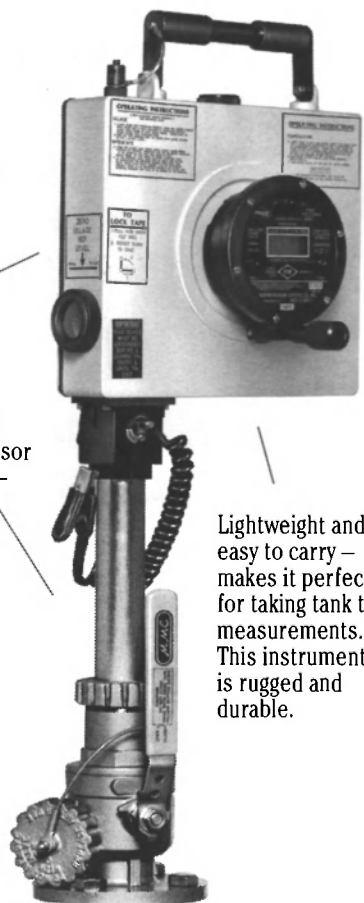
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Offshore Report

make the investment attractive. In fact, many offshore projects can be brought on stream for a cost that would be financially viable at \$15 per barrel, and with technology continually driving down production costs, lower breakeven points are likely in the future. According to SBM, a number of oil fields can be developed economically with oil prices as low as \$10 per barrel, and Elf's Girassol development is expected to break even at \$9 to \$10 per barrel.

The preceding is excerpted from International Maritime Associates' regular report on Floating Production Systems. For information on obtaining a full text version contact: International Maritime Associates, James R. McCaul, 600 New Hampshire Ave., N.W., Suite 140, Washington, DC 20037; tel: 202-333-8501; fax: 253-681-7453; e-mail: imaassoc@msn.com

Current Floating Production System Orderbook

Field	Type	Location	New/Conv	Hull	Topsides	Capacity
Brutus	TLP	GOM	N	Daewoo	J. Ray McDermott	100,000 bpd oil; 9 MM cm/d gas
Sunday Silence	Mini-TLP	GOM	N	Amfels	omega Service	30,000 bpd
Girassol	FPSO	Africa	N	Hyundai	Hyundai	200,000 bpd
Laminaria	FPSO	Australia	N	Samsung [c]	Sembawang	170,000 bpd
buffalo	FPSO	Australia	C	Jurong	--	40,000 bpd
Marlim P37	FPSO	Brazil	C	Jurong	--	150,000 bpd oil; 2 MM cm/d gas
Espadarte FPSO VI	FPSO	Brazil	Upgrade	Keppel Fels	--	100,000 bpd oil; 2.5 MM cm/d gas
Bijupira/Salema P45	FPSO	Brazil	C	TBD	--	55,000 bpd
Terra Nova	FPSO	Canada	N	Daewoo [c]	Bull Arm	125,000 bpd
Isis	FPSO	Med.	C	TBD	--	--
Jotun	FPSO	North Sea	N	Kvaerner Masa [c]	Kvaerner	90,000 bpd
Triton/Guillemot W.	FPSO	North Sea	N	Samsung [c]	Kvaerner	105,000 bpd
Balder	FPSO	North Sea	N	Keppel Fels [c]	UiE	80,000 bpd
Kuito	FPSO	W. Africa	C	Sembawang	--	100,000 bpd
Bluewater Spec	FPSO	TBD	n	Hitachi [c]	TBD	--
Roncador P36	SemiSub	Brazil	C	Fincantieri [c]	Davie Industries	180,000 bpd oil; 5 MM cm/d gas
Marlim Sul P40	SemiSub	Brazil	C	Jurong	--	150,000 bpd oil; 6 MMcm/d gas
Asgard B	SemiSub	North Sea	N	Hyundai [c]	Kvaerner	95,000 bpd oil; 40 MMcm/d gas
Snorre B	SemiSub	North Sea	N	Dragados	Aker Stord	110,000 bpd
Troll C	SemiSub	North Sea	N	Hyundai [c]	Umoe	190,000 bpd oil; 9 MMcm/d gas
Diana/Hoover	Prod. Spar	GOM	N	Aker Mantyluoto	B&R Bayou	100,000 bpd oil; 10 MMcm/d gas
Roncador P47	FSO	Brazil	C	AESA	--	n/a
Marlim P38	FSO	Brazil	C	Jurong	--	n/a
Benchamas	FSO	SE Asia	C	Jurong	--	n/a
Yetagun	FSO	SE Asia	C	Keppel	--	n/a
Asgard C	FSO	North Sea	N	Astano	--	n/a

GOM = Gulf of Mexico [c] = hull completed

Source: International Maritime Associates

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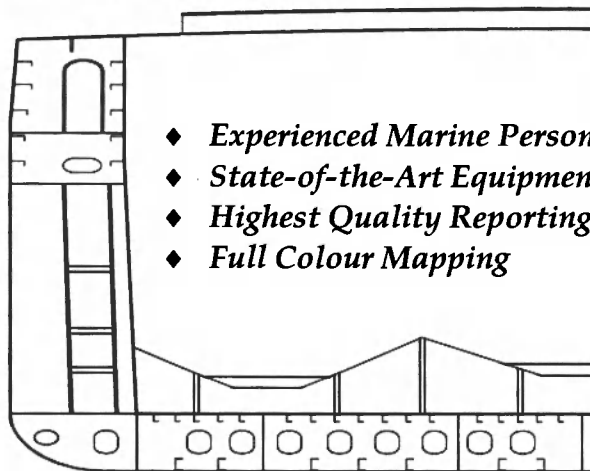
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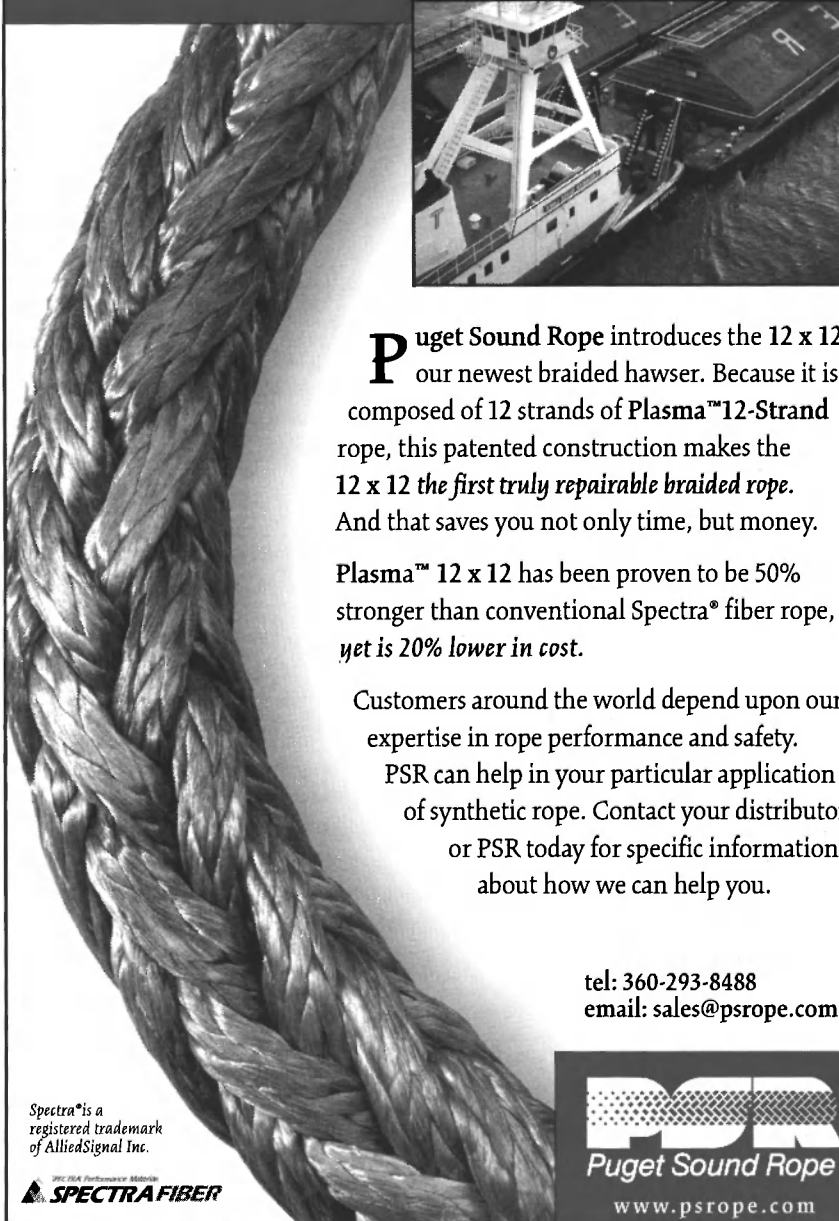
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Hvide Marine Files Reorganization Plan

Hvide Marine, Inc. has filed a proposed Plan of Reorganization that, if confirmed, would deleverage its balance sheet, restore liquidity and enhance the company's competitive position in the marketplace. The plan is a result from discussions with the Official Committee of Unsecured Creditors appointed in Hvide's Chapter 11 case, including representatives of the holders of about 63 percent of the company's \$300 million of 8 3/8 percent senior notes would exchange their Senior Notes for 9,800,000 shares of common stock of the reorganized Hvide Marine, representing 98 percent of the new common equity. Holders of the Trust Convertible Preferred Securities would receive 200,000 shares of common stock of the reorganized Hvide Marine, repre-

senting two percent of the new common equity, together with warrants to purchase an additional 125,000 shares of the common stock of the reorganized Hvide Marine. The warrants would be exercisable at \$38.49 per share and would have a term of four years.

Crowley Announces Restructuring

Crowley Maritime Corp. is planning a significant strategic restructuring that will result in a more decentralized ocean cargo transportation company once the sale of its South America liner services to Hamburg Sud is complete. Having completed this assignment, P. Elliott Burnside will leave the position of president of Crowley American Transport to establish his own industry consulting service, which Crowley will uti-

lize. The company will not replace Burnside and will instead restructure its liner services into two major business units. Puerto Rico and Caribbean Liner services will be led by **John Douglass**, vice president and general manager, Puerto Rico and Caribbean Services, while Central America and Mexico liner services will be led by **Rinus Schepen**, vice president and general manager, Central America & Mexico Services. Crowley's South America liner services will continue to be run by **Frank Larkin**, vice president and general manager, South America Services, until the sale of these services is finalized.

S&P Lowers Pegasus Rating

Standard & Poor's lowered its corporate credit rating on Pegasus Shipping. The rating actions reflect Pegasus' rapidly diminishing financial flexibility owing to weak market conditions. Pegasus owns one of the world's largest independent Panamax tanker fleets. The Panamax tanker sector is currently experiencing weak market conditions, and the market is expected to remain weak in the short term. Arne Blystad S/A, Pegasus' largest customer, which at the end of last year accounted for about 20 percent of the company's revenues, has not been able to pay the time charter rates contracted for the chartered vessels. A settlement was reached in mid-1999 whereby the charter contracts were terminated, and a large portion of the remaining receivable was forgiven in return for an one-time payment.

MHI Establishes Australian Subsidiary

Mitsubishi Heavy Industries (MHI) has established a wholly owned subsidiary, Mitsubishi Heavy Industries Australia Pty. Ltd., which will commence operations on October 1. Headquartered in Melbourne, Victoria, the new subsidiary will have its Air Conditioning & Refrigeration Department in Sydney. **Shingo Ueda**, who currently serves as chief representative of MHI's Australia Representative Office was appointed as managing director of the company, while **Hirokazu Kanamori** will become general manager of MHI's Air Conditioning & Refrigeration Department.


Marine Design Center To Acquire Barge

The Marine Design Center (MDC) of the U.S. Army Corps of Engineers (USACE) intends to attain an inland river style specialty barge to serve on the U.S. Army Corps of Engineers, Louisville District (CELRL) in support of its mission. Measuring 70 ft. (21.3 m) with a 35 ft. (10.6 m) beam, the vessel will be used to wash mud and debris from lock walls, miter gates and floating approach walls at the Olmstead Lock & Dam. The vessel will be designed, built and classed to American Bureau of Shipping (ABS) rules for Steel Vessels on Rivers and Intracoastal Waterways.

Wattyl Acquires Wasser

Wattyl Limited of Sydney, Australia acquired Wasser High-Tech Coatings on July 1, 1999. In its most recent fiscal year, Wattyl achieved sales of \$347 million and pre-tax profit of \$23.2 million. Wattyl specializes in most aspects of the paint and coating industry including architectural and decorative coatings, industrial maintenance, OEM, and marine and automotive refinishing. This acquisition, which strengthens Wasser's ability to both sell and service their growing worldwide business in the offshore markets, also solidifies the company's leadership position in the U.S. Bridge and hydro markets.

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Propulsion Updates

MAN Introduces L27/38 Propulsion Package

MAN B&W has introduced a new generation propulsion package based on the L27/38 diesel engine. The package is designed to fulfill many current and future market needs, while minimizing the life-cycle costs. In particular, the L27/38 is a proven unit which offers a high stroke to bore ratio of 1.4 and a high compression ratio of 16.5 — values which will ensure that emission values are kept well below new limits, which are valid at the beginning of the coming year, without negative influence on the specific fuel oil consumption.

The new propulsion package is, of course, centered around the popular MAN B&W L27/38 diesel engine. But the complete unit features engineering advances throughout, from the incorporation of the new MGS37 reduction gearbox range, to the new VBS CP propellers and the new Alphantronic 2000 monitoring, safety and control systems.

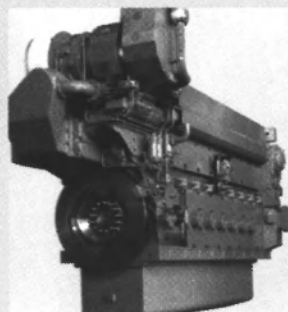
L27/38

The central figure of the new unit is the L27/38 diesel engine, which offers end-users a host of benefits and operational advantages. First, the engine's above-mentioned ability to comply with ever-tightening emissions rules and regulations while not significantly altering performance and consumption numbers is a much sought-after trait by any vessel owner.

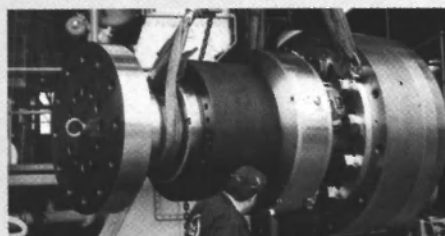
The cylinder head offers a cross flow and inlet swirl, designed to provide optimal combustion and gas exchange



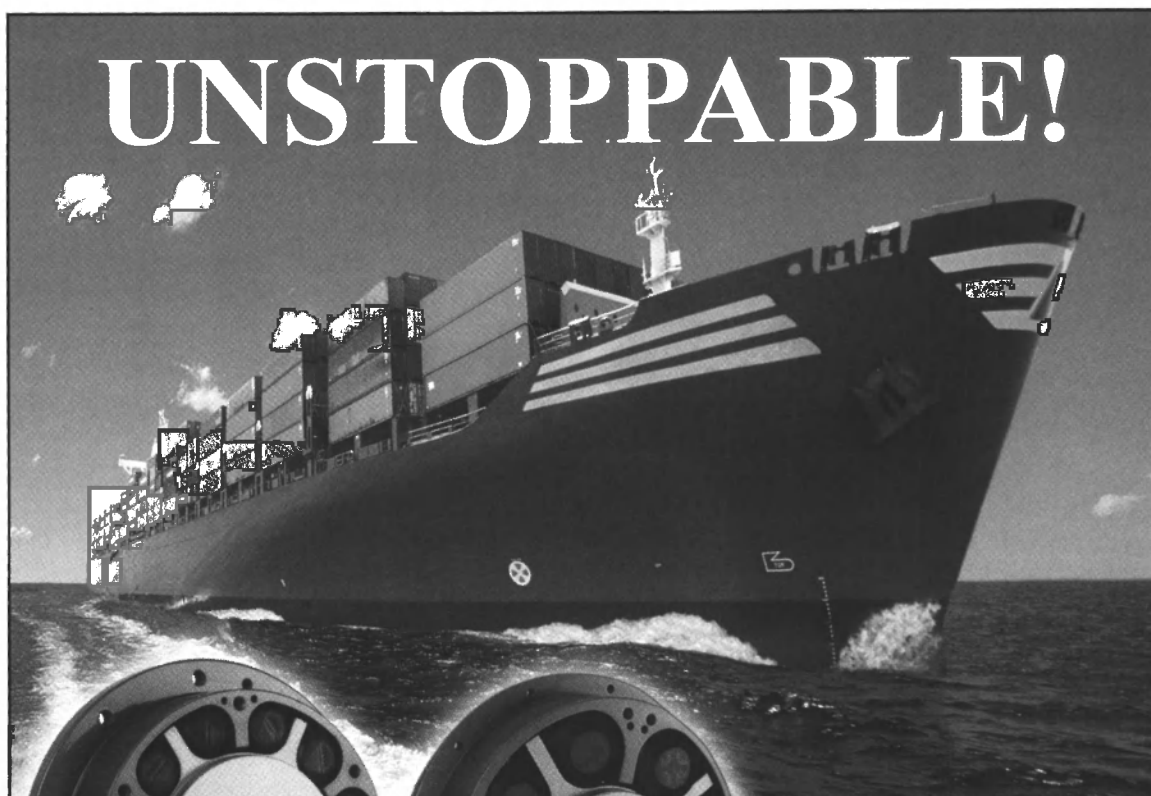
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MAN B&W L27/38



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Propulsion Updates

over the whole load range. In addition, the cylinder unit — cylinder head, water jacket, cylinder liner and connecting rod — can be replaced as one complete unit ... but it is also possible to take the individual components apart, while the

marine head bearing remains on the crankshaft. The company has pointed out that previous problems with ovalization of the big-end bore, resulting in fretting between bearing shell and bearing bore with consequential damage, are

completely eliminated.

In terms of controlling engine size, to better conserve precious onboard space and weight, the company has introduced the Front-End-Box which reportedly contributes substantially to the shorten-

ing the overall length of the unit as much as possible. All external pipe connections are positioned on the sides of the Front-End-Box, and space is only required for exchange of the plug-in type oil and water pumps, etc. The Front-End-Box also has cast ducts for cooling water and lube oil, which means a minimum of piping on the engine.

Standing Watch

Following the trend toward increasingly sophisticated electronic monitoring and control, the L27/38 package integrates a fully electronic and redundant local instrumentation concept for both the engine and the gearbox, providing extensive monitoring and excellent overview for the operator.

The operator panel for the engine is placed next to the governor in order to give the operator the best possible condition for controlling and monitoring the complete engine from one position only. Also, the operator panel for the gearbox and propeller is found next to the operator panel for the engine.

Local monitoring and control are divided into two systems, one for the engine and one for the gearbox and propeller. The computer units — dubbed Alphacomm units — are all acting as data collection devices, interconnected via a redundant bus. Additionally, one Alphacomm unit serves the engine-related controls and one Alphacomm unit acts as a redundant safety system.

The local monitoring systems and the safety system are based on three identical computer units mounted on engine and gearbox. Only one unit will thus be required as a spare part. If a unit needs to be replaced, the programming of the new unit is done automatically by transferring a copy of the program from one of the other two units on the network, a fully automatic programming feature, which was patented by MAN B&W.

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Raytheon

Propulsion Updates

#4 unit was installed on the cooling water pumps suction line of each of the vessel's EMD engines.

In July of 1999, after 80 months of operation aboard Gulf Fleet 61, the cWc conditioners and several cooling water pipes were removed, and all inspected

pipings was free of scale, the water samples clear and of a neutral pH level.

The cWc cooling water conditioner works because, when circulating cooling water flows through the unit, water molecules and minerals in the water become polarized and realign, staying in suspen-

sion and thus not sticking to surfaces. The charged particles in passing make contact with mineral deposits that also become polarized, and are lifted from surfaces and are carried in the cooling water unit flushed from the system.

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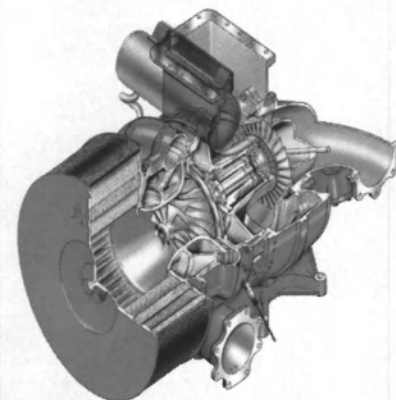
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ABB Debuts New Turbocharger Technology

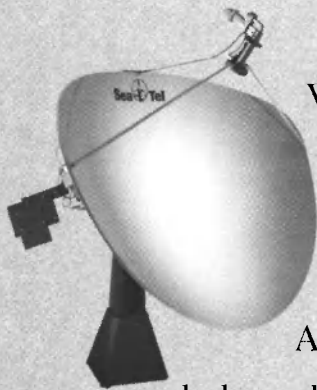


Earlier this year, ABB Turbo Systems of Baden, Switzerland started delivering the latest new product from its well-regarded TPL turbocharger family, the TPL..-B turbocharger. The TPL..-B turbocharger is designed for two-stroke diesel engines as a robust and reliable platform for engine applications ranging from 5,000 to 25,000 kW per turbocharger. The unit is designed for simplicity as much as technical excellence, and the modular design boasts fewer parts than any generation before it, a trait which is designed to equal less and easier service and maintenance, as well as lower life-cycle costs. This concept is plainly evident in the fact that ABB's special TPL inboard plain bearings are designed for 35,000 operation hours, effectively doubling the lifetime of turbocharger bearings. In addition to the new bearing design, the TPL series of turbochargers have no water cooling, and feature integrated turbine and compressor cleaning devices, all factors devised to minimize downtime. As is the hallmark of all ABB products, however, service and support are available around the world, 24-hours per day, in the event of a product breakdown. Since the market introduction, 70 units have been sold in the past six months, equaling supercharging of a total engine power of nearly 1.4 million hp.

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Disney Wonder is the second of two for Disney Cruise Lines from Italy's Fincantieri. The ships have been built to encase the unique Disney experience on the high seas, and have successfully integrated entertainment agendas with a ship design that is stable, efficient and environmentally friendly.

Navigating Rough Waters

The cruise industry, enjoying a record run of popularity and profits, has been smacked by several recent mishaps at sea, which has in turn sparked the interest of legislators and international policymakers.

The spate of recent accidents at sea involving high profile cruise ships has spurred fears among owners and operators that once again the long arm of the law will be reaching out to demand new levels of safety products, systems and procedures onboard luxury cruise liners. The cruise shipping industry, which has enjoyed unprecedented growth for much of the decade, has been beset by some unsightly accidents and mishaps that have raised the watchful eyes of legislators around the globe.

At a recent hearing on S. 1510, The United States Cruise Ship Tourism Development Act, Senator **John McCain**, Chairman of the Senate Committee on Commerce, Science and Transportation, said in his opening statement: "I believe that continued failure by the international cruise industry to abide by all U.S. and international laws and regulations for operation in and out of our ports and to

meet high standards with regard to passenger safety and well-being will result in action to restrict access, not expand it. I challenge them to improve their operations and warn them that if they don't, the Congress will act." The statement is made more significant by the fact that S. 1510 is not about improving cruise ship safety, per se, rather a measure to allow more U.S. companies to reap the benefits of the cruise popularity windfall.

Weathering the Storm

Senator McCain's statement in his testimony clearly indicates that, warranted or not, safety issues aboard modern cruise ships is clawing its way toward the top of legislative agendas. Maritime safety, in general, is a very emotional topic that usually peaks immediately following accidents, i.e. Exxon Valdez. The cruise industry has unintentionally placed a full plate of fodder for legisla-

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ors to chew on. A series of accidents at sea, combined with recent criminal activity surrounding sex crimes and pollution, have generated more bad publicity for the cruise market in the past few months than the past few years combined.

The latest incident involved a fire in the engine room aboard Carnival's *Tropicale*, an accident that left the vessel without power and on the fringe of a tropical storm. Compounding the matter, the consumer press in the U.S. has sensationalized the matter, giving extensive, disparaging coverage regarding conditions aboard the disabled vessel, which was carrying approximately 1,700 passengers and crew.

Not to isolate Carnival, but it was recently involved in another scandal regarding sexual assault.

Carnival Cruise Lines, which carry about two million vacationers a year, was accused of sexual assault 62 times in the five years up to last August. Carnival Cruise Lines gave few details of the 62 allegations investigated by company security staff other than to say each matter was referred to police if the accuser wished. At the time, Senator McCain said: "I am extremely concerned about recent reports of cruise ship crew members sexually assaulting passengers and co-workers. Cruise ship companies should do everything in their power to ensure that this criminal activity does not occur, regardless of where the ship is flagged."

Carnival — and for that matter, the U.S. cruise market — has not been alone in its troubles, as two other prominent carriers — Norwegian Cruise Lines and Royal Caribbean — have had recent troubles as well.

Norwegian Cruise Line's 50,764-gt *Norwegian Dream*, carrying 2,400 passengers — was involved in a collision with the 52,090-gt, 1997-built container ship *Ever Decent*, in the English Channel. While only three passengers on the Bahamas-registered liner were injured, the incident has raised many concerns, as, although it occurred in the middle of the night, winds were light and visibility was good, and each vessel was reportedly outfitted with working version of the latest electronics and collision avoidance systems. Both ships were badly damaged, and several large containers with a newfound home on the deck of *Norwegian Dream* served to punctuate the severe damage to the ship's bow and bridge.

Meanwhile, Royal Caribbean executives spent a few days at the end of the summer touring ports in Alaska to apologize in person for pollution left in the state's waters by the cruise line's ships. Royal Caribbean agreed to pay an \$18 million fine to U.S. authorities for dumping oily bilge and chemical wastes

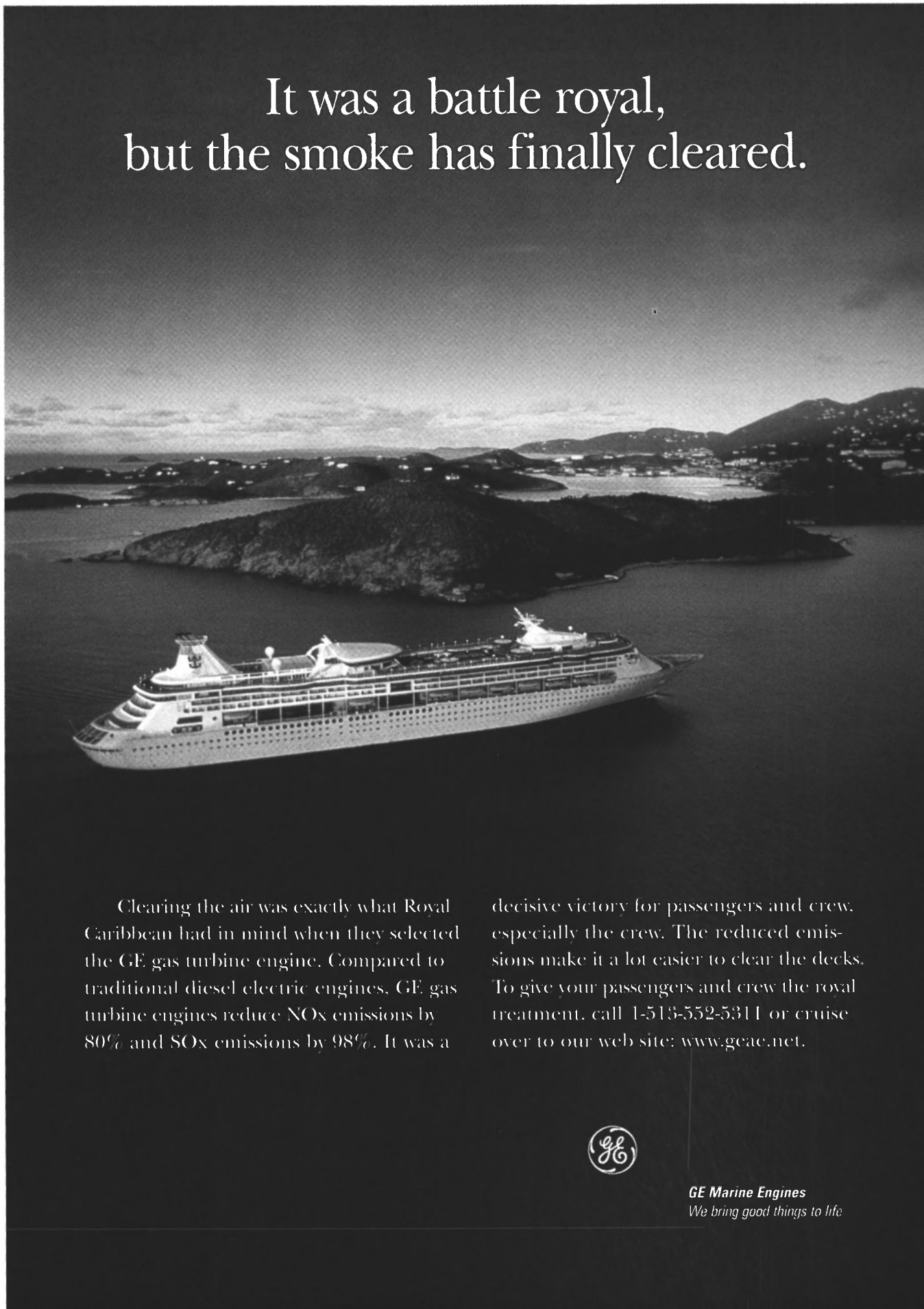
at sea, as well as into U.S. ports and wild waterways. The line plead guilty to

(Continued on page 35)

M/S *Europa* bucks the current cruise ship trend towards "bigger is better." The 646-ft. (196.9 m) luxury suite ship, built at Kvaerner Masa-Yard's Helsinki Shipyard, accommodates only 408 passengers, making it one of the most spacious cruise ships in the world. The vessel was designed and built — from the signing of the contract — in only 21 months.



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decisive victory for passengers and crew, especially the crew. The reduced emissions make it a lot easier to clear the decks. To give your passengers and crew the royal treatment, call 1-513-552-5311 or cruise over to our web site: www.geac.net.



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USCG: Standing Watch Over The Cruise Industry

In testimony before the U.S. House of Representatives on the matter of Cruise Ship Safety, U.S. coast Guard Rear Admiral **Robert C. North**, Assistant Commandant for Marine Safety and Environmental Protection, made some interesting observations. Central to his testimony, however, was a call for support of the USCG Deepwater recapitalization of cutters, aircraft and CFISR (command, control, communications, computers, intelligence, sensors, and reconnaissance), a bolstering of assets critical to offshore rescue operations, particularly if the offloading of thousands of passengers from today's large cruise ships, was ever needed.

Following are select quotes from his testimony.

- "Much of the history of the regulation of maritime safety has been reactive — disasters followed by legislation. Maritime safety has transitioned from the historical "reactive" approach to today's proactive, systematic, risk-based approach, exemplified by the Passenger Vessel Safety Act of 1993, which

focused on passenger vessels evading inspection through charter arrangements. The risk posed by these vessels was recognized before casualties occurred, and action was taken to prevent casualties.

- Recent accidents show us just how well these standards work to protect the safety of passengers and also identify areas of improvement. In July 1998, the *Ecstasy* experienced a fire, which started in the laundry room and spread to the aft mooring deck. Structural fire protection, an on-board sprinkler system, and crew response helped to keep the fire localized to the mooring deck area. The incident, however, revealed some areas for standards improvement related to the mooring deck area.

- The Coast Guard has taken a leadership role in the international arena, where projects are underway to continue the improvement of standards and the application of technology. There are several projects being pursued at IMO. One project is the revision of the SOLAS fire protection chapter, to be completed by

IMO in 2000. This incorporates interpretations agreed upon over the past five years, eliminates many vague SOLAS phrases, such as "to the satisfaction of the Administration," and reorganizes the chapter into a more user-friendly document in order to achieve a more consistent application of SOLAS among different nations. Another project is the development of new inspection and test procedures for lifesaving equipment, which will also address remaining differences in domestic and international regulations. An IMO subcommittee is also looking into improving ship subdivision and damage stability standards to minimize flooding and prevent capsizing of vessels. Other initiatives being pursued at IMO are related to passenger evacuation analysis, search and rescue planning, and crew training and watch-keeping. At the International Organization for Standardization (ISO), the Coast Guard is spearheading the development of new international standards for safety equipment not currently covered by IMO.

- Another area of concern is the level of sanitation aboard passenger vessels. Oversight of sanitary conditions on passenger vessels is the responsibility of the U.S. Public Health Service (USPHS). The USPHS conducts both scheduled and surprise inspections of passenger vessels in U.S. ports. The inspections focus on proper sanitation for drinking water, food storage, food preparation and handling, and general cleanliness. The USPHS will provide the public with results of inspections on individual vessels, and take reports of unsanitary conditions on individual vessels.

- We have an aggressive enforcement program, which is second to none. But, we are not satisfied and continue to enhance our efforts through research and development, increased use of risk methodologies to identify the most probable causes of accidents and how to mitigate the consequences, and partnerships with vessel operators to improve their safety posture and to plan jointly for emergencies. These collective efforts have achieved a remarkably low casualty rate for ships operating out of U.S. ports. But, we are not content to maintain the status quo...we are determined to improve cruise ship safety and compliance even more.



DuraCooler™

Carnival Founder Ted Arison Dies

The creator of the world's largest cruise shipping company found his roots in the family cargo shipping business.

As initially reported in the October 1999 edition of *Maritime Reporter & Engineering News*, **Ted Arison**, a pioneer of the modern-day cruise industry, died in Tel Aviv, Israel, from heart failure. He was 75. Arison co-founded Norwegian Caribbean Lines in Miami in 1966. In 1972 he started Carnival Cruise Lines utilizing a refurbished former transatlantic liner. By the time he retired as chairman of Carnival in late 1990, the company had become a three-brand line, Carnival Cruise Lines and Holland America Line, and Windstar Cruises operating 15 ships. As the organization continued to grow, a corporate holding company, Carnival Corporation, was created in 1993. Today Carnival Corporation operates six brands, wholly owning Carnival Cruise Lines, Holland America Line and Windstar Cruises, with majority interests in Cunard Line, Seabourn Cruise Line and Costa Cruis-

es. (Note: At press time, Carnival formerly announced a plan to purchase the remaining interest in Cunard.)

Following his retirement, Arison continued to be active in the cruise business serving as a consultant overseeing Carnival Corporation's multi-billion dollar shipbuilding program. Since 1982, Arison directed the construction of 20 new passenger ships for Carnival Corporation companies.

Arison's son **Micky** assumed the chairmanship of Carnival in 1990 on his father's retirement, and is also now managing general partner of the National Basketball Association's Miami Heat.

The Early Years

A family tradition in shipping helped Ted Arison gain the experience that would place him in the forefront of modern, post-war passenger cruising. The Israeli-born son of a ship owner,

Arison decided to by-pass a career in the industry for an engineering education. He entered the American University of Beirut at age 16, but World War II interrupted his studies.

Joining the British Army, he served in Italy and Germany, attaining the rank of sergeant major.

After the war, Arison's father died and, as the only son, he was asked to assume control of the family business, M. Dizengoff and Co., shipowners and general agents for several lines.

Two years later, he was back in uniform serving his native country as a lieutenant colonel during the Israeli War of Independence. In the early 1950's, the Dizengoff firm was sold to Zim Lines and Arison operated his own fleet of cargo ships under Panamanian and Honduran flags. A depressed market, which reached its low point after the Korean War, convinced him to give up shipping

entirely, and he liquidated his operation to move to the U.S.

For a 12-year period beginning in 1954, Arison embarked on a number of ventures in the air cargo industry, including a publicly traded company with a \$10 million market value. In 1966, however, he chose to retire in Miami and sold his holdings to the parent firm.

But soon afterward, he gave up early retirement to assume the management of a passenger shipping company in Miami. A disastrous financial situation left that company without a vessel, and Arison called upon Norwegian ship owner **Knut Kloster**, whose new Sunward recently had been completed in Europe. Less than two weeks later, Arison and Kloster negotiated agreements that brought the Sunward to Miami, and thus began Norwegian Caribbean Lines. The company later initiated the first packaged air fare and cruise combinations which are a staple of today's industry.

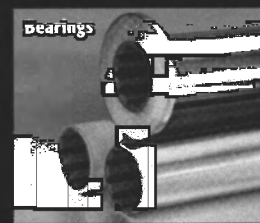
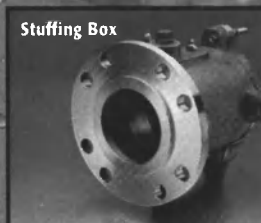
Kloster and Arison parted company in 1972 and, almost immediately, Arison entered into the financial arrangement which resulted in the acquisition of the Mardi Gras and the start of Carnival Cruise Lines.

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Cruise Industry Report

P&O Stakes Claim In German Cruise Market

P&O will enter the German cruise market with an initial investment of \$80.6 million in a 51 percent stake in a joint venture cruise company it is forming with privately owned German group

Arkona Touristik.

The new company, Aida Cruises, will reportedly order two new ships to complement the 1,200 berth Aida. P&O has an option to take full control of the venture once the ships are delivered.

The company maintains that Germany is the next big market to be developed

for ocean cruises, and will allow P&O to build on its strengths in the three existing key markets - the U.S., Britain and Australia.

P&O is also acquiring the Seetours International business from Arkona for an undisclosed sum; the Aida and Seetours business combined representing 25

percent of the German cruise market. Arkona is owned by the Rahe family through the former East German shipping group DSR, privatized in 1993.

Aida is aimed at younger to middle-aged Germans and offers health and fitness facilities on board. The two new ships, to be built by the Aker MTV Werft are scheduled for delivery in 2002 and 2003.

Last month P&O said its Princess Cruises business performed strongly in the third quarter with occupancy reaching 103.8 percent from 101.7 percent a year earlier. P&O Cruises (U.K.) had occupancy of 99.7 percent against 99.9 percent. Princess yields for the year to date were in line on a like-for-like basis with last year despite a 24.4 percent increase in capacity, it added. P&O said demand for cruises -- which account for some 40 percent of group operating profit -- remained high with Princess bookings for 2000 particularly strong in the Caribbean and Alaska. P&O Cruises (U.K.) bookings for 2000 were also progressing well with yields in line. Princess Cruises includes nine ships operated from the U.S. and one in Australia. P&O Cruises covers three British-based ships and the Swan Hellenic ship Minerva.

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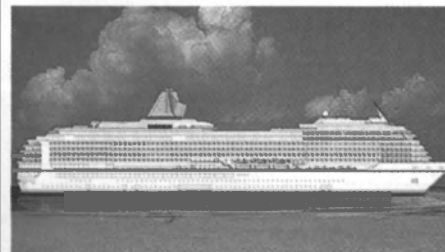
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AMCV Vessels Taking Shape



The much-watched progress of two new cruise vessels under construction for AmericanClassic Voyages at Ingalls Shipbuilding are quickly taking shape, at least in the area of equipment selection. The ships are destined for Hawaii inter-island service, and will be the largest U.S. flag cruise ships ever built, and the first large passenger vessels built in the U.S. in more than 40 years. The project has generated an understandable amount of interest in the world shipbuilding community, and competition to secure an order on the ship has been fierce.

Last month it was divulged that the Mermaid podded propulsion system was selected to propel the first two vessels, with an option for a third. Each ship will be equipped with two Mermaid propulsors, each with a rated power of 12.5 MW. The Mermaid system was jointly developed by Kamewa and ALSTOM, with Kamewa responsible for hydrodynamics and ALSTOM for the electric drive. The \$28.5 million

order also includes power generation and high voltage distribution from ALSTOM Drives & Controls. The first ship will be delivered to the shipowner in the beginning of the year 2003.

For power, Litton has chosen four Wartsila 8L46C medium-speed diesel engines (combined output of 33,600 kW at 514 rpm) to drive the ships. "The two main reasons for choosing the Wartsila 46 engines for Project America was their proven reliability and their environmental values," said Jon Rusten, president of Ocean Development Co., who is responsible for the newbuildings for the owner.

The engines will be built at the company's Turku works in Finland, and are being supplied in a package contract, including a wide range of ancillary equipment, including resilient mountings, elastic shaft couplings and exhaust silencers, together with fuel, lubricating oil, starting air and central cooling.

For more information on the Mermaid Podded Propulsion Systems

Circle 27 on Reader Service Card

For more information on the Wartsila 8L46C medium-speed diesel engines

Circle 28 on Reader Service Card

NCL Expects \$5.9 M Loss From Grounding

NCL Holding ASA expects losses from the grounding of Norwegian Sky to total \$5.9 million, including \$2.5 million from NCL's part in insurance payments and loss of on-board income not covered by insurance and a \$3.4 million for cost cuts on future cruises. Norwegian Sky ran aground in the upper St Lawrence River. As a result, three cruises were canceled.

Kuoni/INTRAV Deal Finalized

Kuoni Travel Holding Ltd. finalized its \$115-million acquisition of INTRAV, the U.S. luxury tour operator, and its subsidiary, Clipper Cruise Line, which

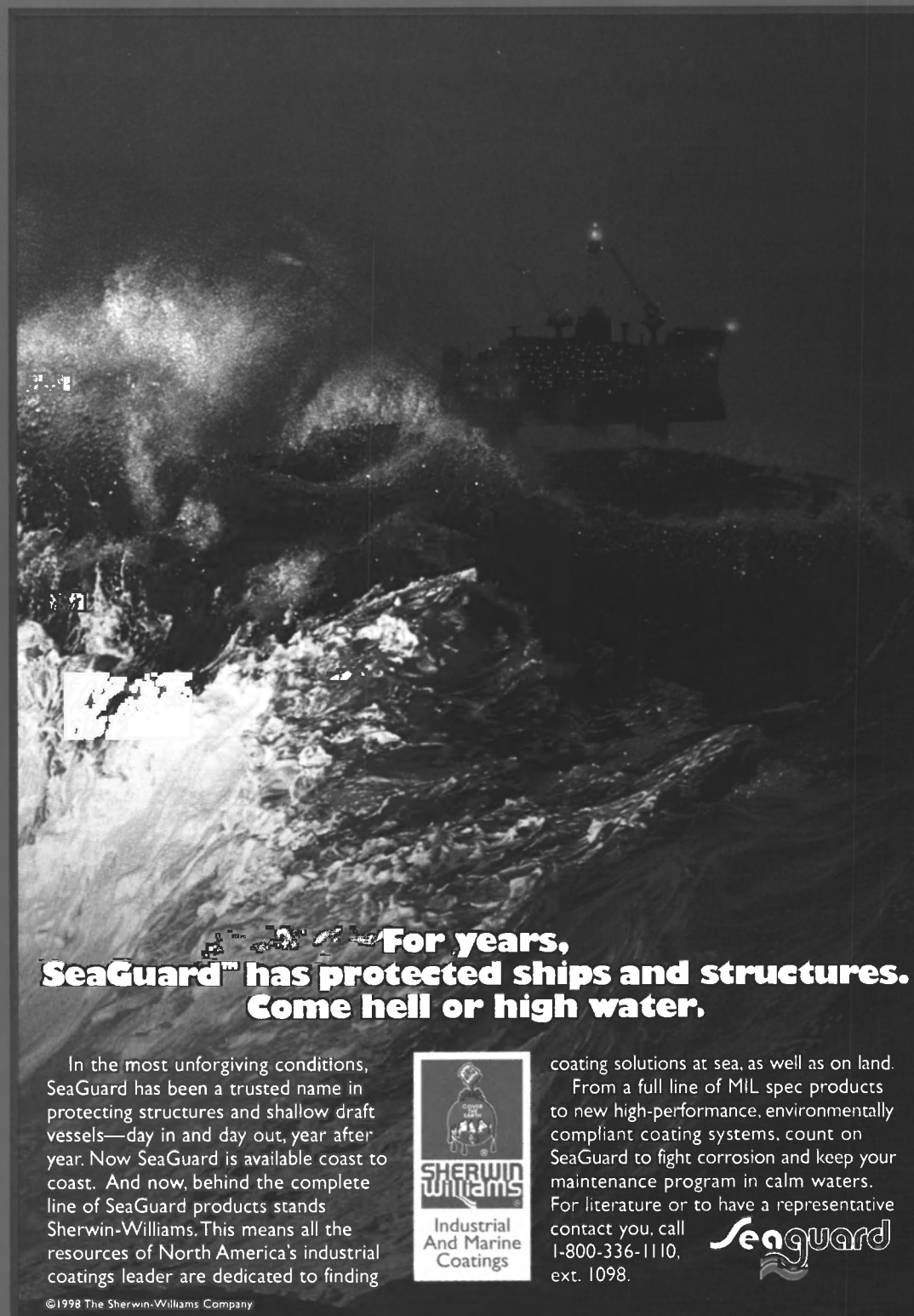
are based in St. Louis. **Ian Coghlan** is the new CEO of both companies, replacing **Paul H. Duynhouwer**, who has acquired a majority stake in Clipper's two U.S.-flag ships, Nantucket Clipper and Yorktown Clipper. In addition, Duynhouwer will be the majority owner and CEO of New World Ship Manage-

ment, LLC, formed to operate all four Clipper ships, including the two U.S.-flag ships, as well as Bahamian-registered Clipper Adventurer and Clipper Odyssey.

The INTRAV acquisition marks Kuoni's first major entry in the U.S. market under the newly formed Strate-


gic Business Unit (SBU) for the U.K. and North America.

Peter Diethelm, member of Kuoni's group executive board and head of the SBU, remains executive chairman of Kuoni U.K., chairman of the two Kuoni Caribbean hotels, and president of INTRAV.



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Gas Turbines Take Center Stage

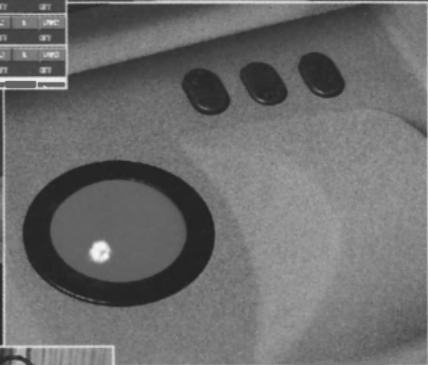
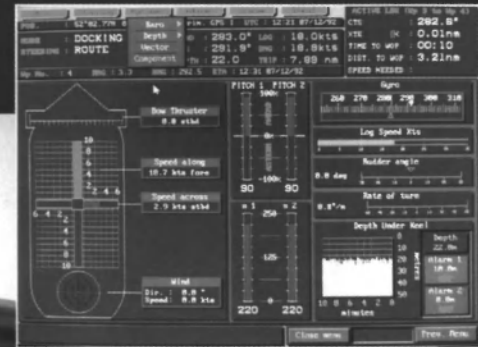
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(Continued from page 29)

felonies, including falsifying logs and lying to the U.S. Coast Guard, and admitted Royal Caribbean ships were rigged with secret bypass pipes, which were used to dump used dry-cleaning chemicals and other waste. The fine, the highest ever assessed by a cruise line for polluting U.S. waters, followed \$9 million in fines Royal Caribbean agreed to pay in 1998.

The Silver Lining

Although the cruise market has endured recent rough waters, it is a solid bet that the industry will continue to design, build and deliver vessels that help meet the burgeoning demand of cruise passengers, while meeting the demands for more luxurious accommodations and diversity of activities on board. A recent delivery to forward these values was the Disney Wonder from Fincantieri, which, like its sister-ship, embodies the style and finesse of the classic liners, or as Disney bills it, the modern classic. The 83,000-ton, 964-ft. (294-m) Disney Wonder is truly an elegant ship, with pictures not quite providing it just due. Propelled by the diesel/electric combo of five 16-cylinder Sulzer engines and two 19-MW GE propulsion motors, the ship can attain a maximum speed of 24 knots.

The Disney "fleet" has positioned itself into an interesting cruise market niche, catering to adults, families and children. Being a Disney product, the focus on entertainment and education for the younger set is amply accommodated with more than 15,000 sq. ft. dedicated to children's areas, split between the Disney Oceaneer Club for 3-8 year olds; and the Disney Oceaneer Lab for 9-12 year olds.

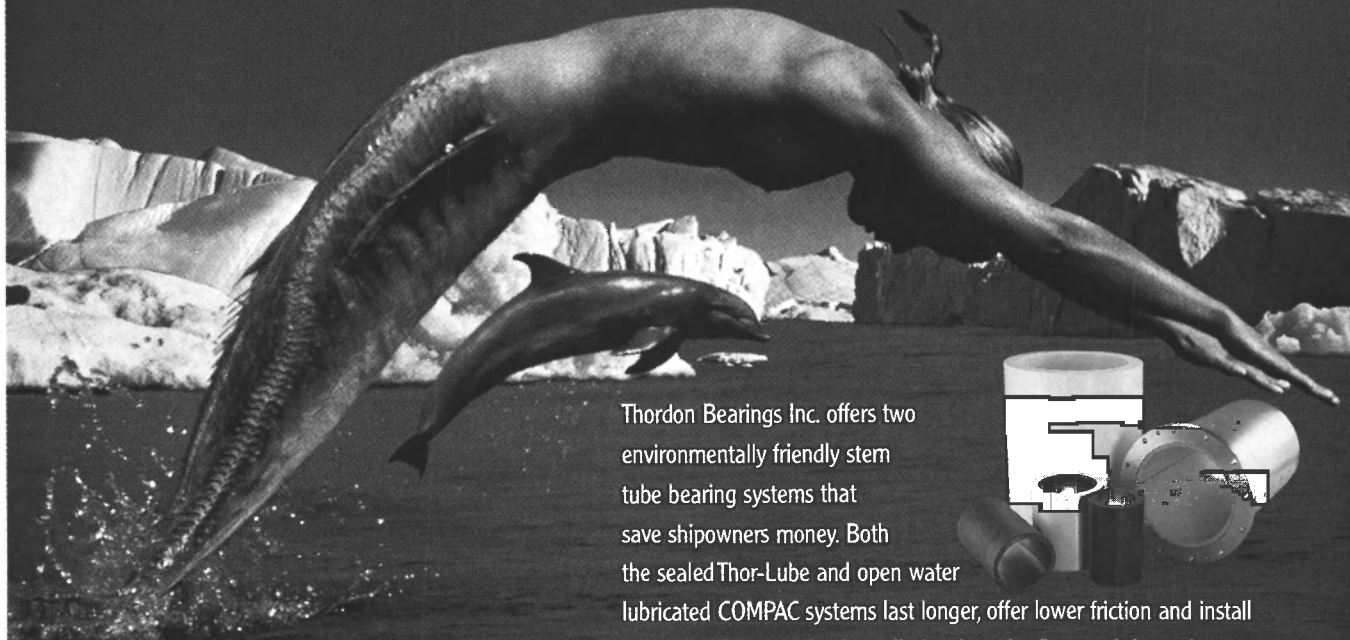
Another recent boost for the industry involves the signing of the contract to build the 12 deck, 644 ft. (195.8 m) ResidenSea vessel, an ocean-going luxury resort designed for the rich in that the onboard rooms and suites are for sale. The vessel was conceived four years ago by Norwegian cruise magnate **Knut Kloster Jr.**, and represents a new concept in cruising. Buyers of ResidenSea accommodations must have a net worth of at least \$5 million and be of "good character." The prices of the 110 luxury apartments are in the range \$2-6.84 mil-

lion, plus maintenance of five to six percent of the price tag. While the contracted vessel is much smaller than the original plans (40,000 tons and \$350 million v. 86,000 tons and \$545 million), spirits were high as the signing of the contract with Norway's Fosen Mek. Verksteder AS was the culmination of years of work to secure financing for the high-profile ship. Fosen shipyard nudged out Germany's Howaldtswerke-Deutsche

Werft for the contract reportedly because the German yard could not comply with the scheduled target date for delivery. New from Kvaerner Masa-Yards' Helsinki New Shipyard is MS Europa, built for Germany's Hapag-Lloyd. The 28,400 gt ship is built to carry only 408 passengers, making it one of the most spacious cruise ships on the market. It was designed and constructed with an "all outside concept,"

meaning that all passenger suites face the sea. The ship was designed by the owner in conjunction with the yard, and included the efforts of notable companies such as DeltaMarin, Yran & Storbraaten, and consulting architect Wilfried Kohnemann. The vessel is also significant because it was designed and built in just 21 months, from the signing of the contract. This feat is impressive given the long backlog of cruise ships.

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GT	28,400
Passengers, max	408
Passenger suites	204
Crew	270
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Main engines	(2) MAN B&W 7L 40/54
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Propulsion	Azipod (2 x 6.65 MW)
Speed	21 knots
Classification	Germanischer Lloyd

New Ships, Management Contract Put Silversea In Good Position

With the construction of new sister ships progressing as scheduled and the recently signed contract to manage the world's first ocean-going luxury resi-

dence, Silversea cruises is well poised for growth in the next millennium.

The line was founded in 1992 with the concept of offering all-inclusive, ultra-

luxury cruises to all parts of the world. The first ship, Silver Cloud, debuted in 1994, followed by Silver Wind in 1995. In five years, the line emerged as a

leader in the ultra-luxury cruise market and is internationally recognized as the world's best small ship cruise line.

The company's strong performance has made it possible to expand the fleet after only four years of operation. In May 1998, Silversea signed a contract for two new ships. Silversea's two new sister ships, the 25,000-grt, 388-passenger Silver Shadow and Silver Mirage, currently under construction at the T. Mariotti Shipyard in Genoa and the Francesco Visentini Shipyard near Venice, Italy respectively, incorporate technological innovations and guest suggestions.

Architectural team **Petter Yran** and **Bjorn Storbraaten** of Oslo, who designed Silversea ships Silver Cloud and Silver Wind, have been commissioned again to design the two new ships. The new vessels will be quite similar to the existing Silversea ships. Each ship will feature a crew of 295 and a passenger space ratio of 64 — more space per guest than any other cruise ship.

Each ship will have 194 ocean-view suites, with more than 80 percent featuring private teak verandas. The ships have been designed for a greater concentration of larger suites located midship. New aboard each ship will be connecting suites that allow families and friends to travel together but maintain separate rooms. Other new features include a poolside grill, an expanded spa and fitness facility, a computer center, a conference center, a cigar club, a wine bar, and self-service laundry facilities.

"These new ships will offer the same standards of luxury that our guests have come to expect aboard Silver Cloud and Silver Wind," said **William L. Smith**, president and COO of Silversea. "Some of the design specifications have been enhanced following input from our guests, but the hallmarks of Silversea — veranda suites, single seating dining and show lounge, spacious public areas and impeccable service — will certainly be found aboard the new ships."

Both ships will be 11 decks high, 597 x 82 ft. (181.9 x 24.9 m). Each will have a draft of 19.5 ft (5.9 m) and a maximum speed of 21 knots.

The first of the two ships, Silver Shadow, will be delivered in September 2000. The Silver Shadow, which is completed up to deck six, was launched at the Visentini Yard on Oct. 9 and arrived at the T. Mariotti Shipyard on Oct. 20 for final construction and outfitting. The ship's inaugural voyage, from Rome to

(Continued on page 39)

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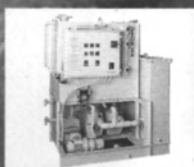


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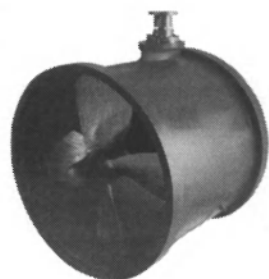
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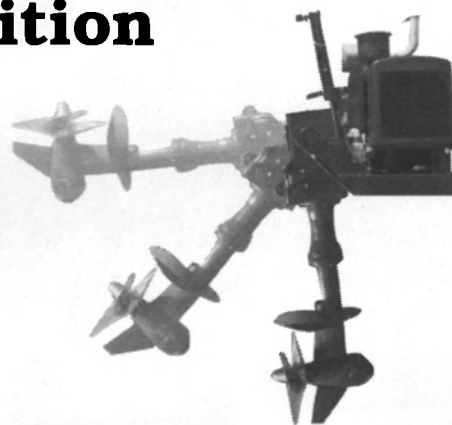
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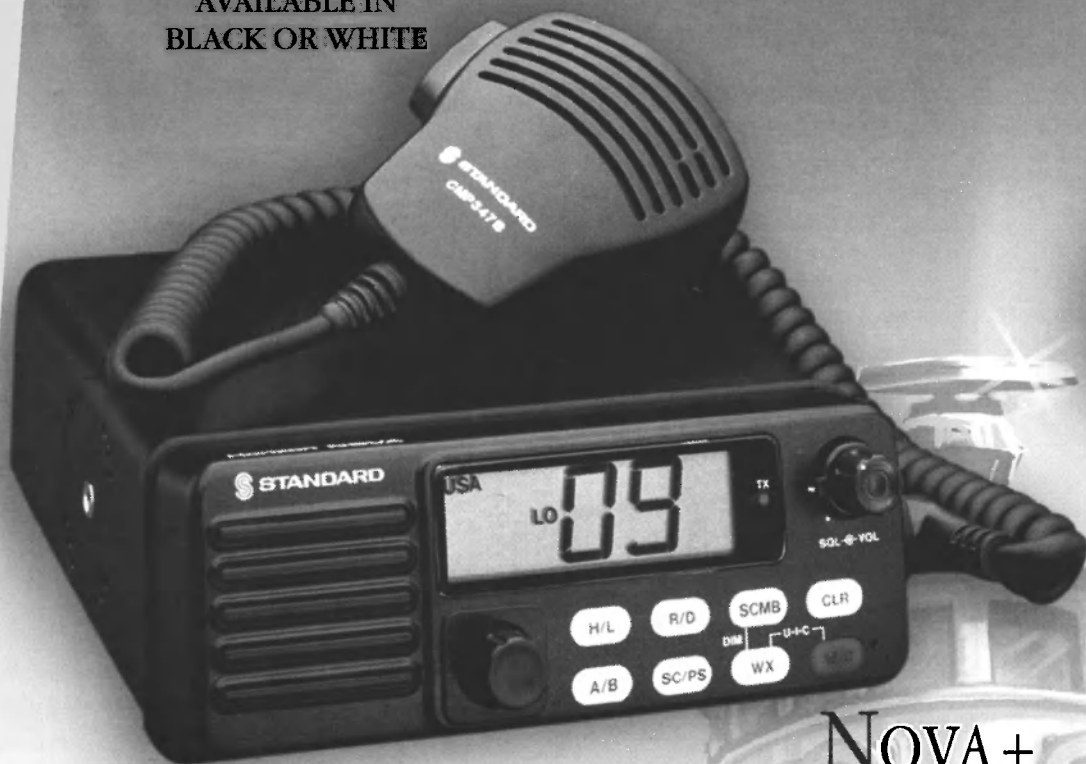
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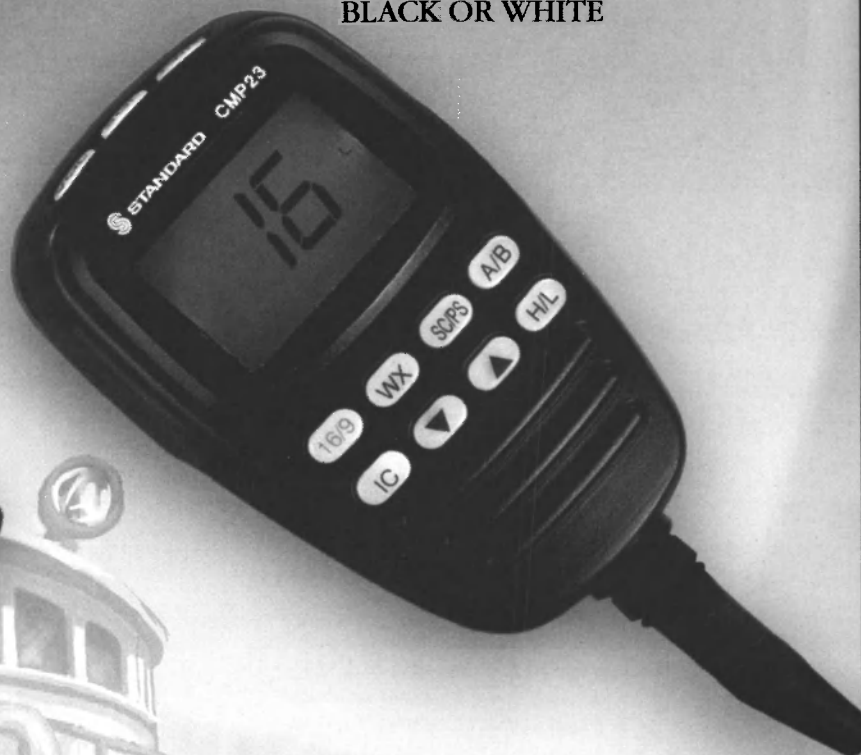
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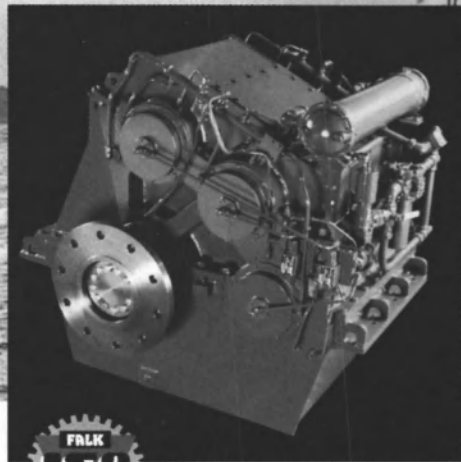
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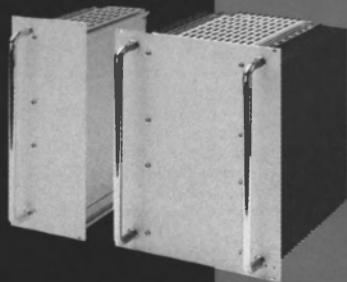
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Cruise Industry Report

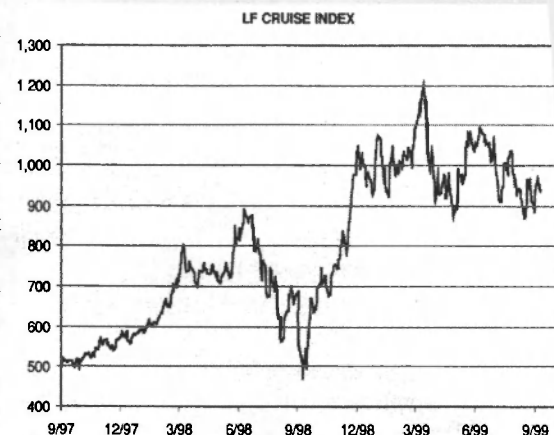
Year's End Appears To Be Timely For Buying Cruise Share

Now is the time to buy cruise shares, says a cruise industry review released by Lazard Frères & Co., which notes that although shares have been up and down in the past few weeks with only a 1 percent increase in the last month, the relatively defensive performance of the cruise/leisure segment is encouraging.

The report states cruise shares are sensitive to any data showing a slowdown in consumer spending in 2000. In September, a decrease in the Consumer Confidence Index was enough to cause a 7-8 percent drop in Carnival and Royal Caribbean shares. However, a closer look showed a tendency of the CCI to soften in autumn months. At 134.2, the CCI is 6 percent higher than a year ago, actually suggesting stronger confidence among consumers.

According to Lazard Frères, the stage has been set for a first quarter rally in consumer stocks driven by a reversal in what appears to be a temporary widening of borrowing spreads, caused by Y2K concerns that should subside by the end of the first quarter. If borrowing spreads start to narrow in the early months of 2000, a rally in consumer spending is likely, and will probably be led by cruise shares.

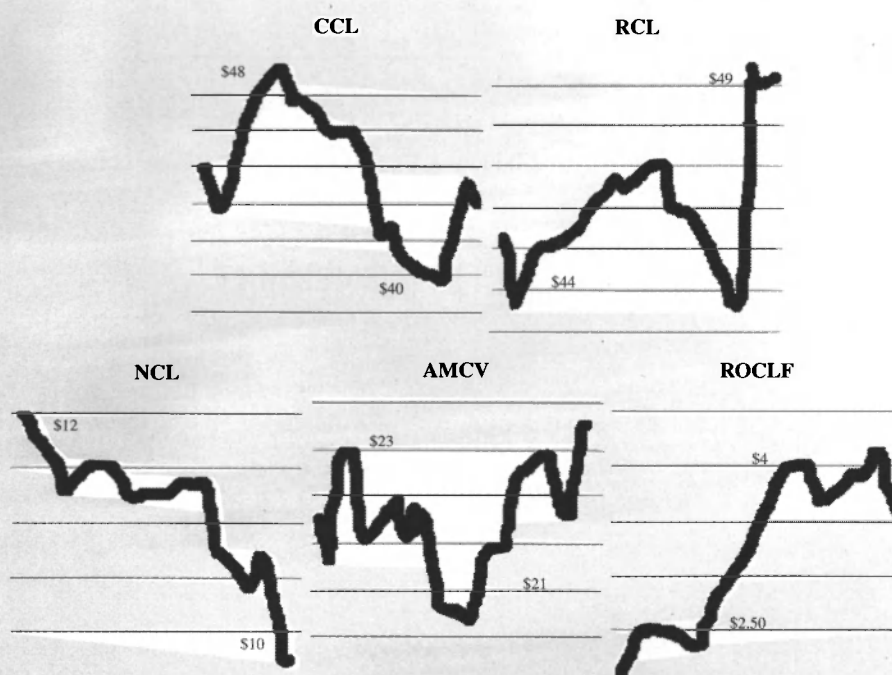
Since fourth quarter cruise bookings are usually seasonally slower, and cruise lines often discount year-end sailings, the fourth quarter is a difficult period to get a consistent indication of pricing or demand in the coming year. This year, the report says, the influence of millennium travel clouds the picture even further. The first firm indication of cruise shares performance for the new year, according to Lazard Frères, will not be until late January to early February. Generally, though, the first quarter has been favorable for cruise stocks, reinforcing beliefs that the shares are a timely buy.



Cruise Stock Performance

10/99	CCL	RCL	P&O	NCL	AMCV	ROCLF	STAR
Price (US \$)	\$43.94	\$46.38	\$31.50	\$2.84	\$21.25	\$3.13	\$5.50
Shares. Out. (mm)	616.9	195.1	321.4	238.9	17.9	14	624.5
Market Cap. (\$mm)	\$27,105	\$9,047	\$10,124	\$678	\$380	\$44	\$3,434

One Month Performance (Sept. 24 to Oct. 25, 1999)



(Continued from page 36)

on, is scheduled for Sept. 15, 2000. voyage is fully booked and waitlist-A trans-Atlantic trip from Lisbon to New York is also scheduled, followed by cruises down the Atlantic coast to Caribbean. The ship will spend the winter traveling the coasts of Brazil, Argentina, Uruguay and Chile. Silver Mirage is scheduled for delivery in June 2001.

In December 2001, The World of Residensea, the world's first ocean-going luxury residence, is scheduled for delivery. Silversea Cruises recently signed a contract with Residensea Ltd. to be responsible for the maritime and hotel management of the \$262 million, 40,000-grt vessel made up of 110 privately owned residences and 88 guest suites. Silversea will be completely responsible for the sales and marketing of the guest suites, and serve as a consultant during the ship's construction at Norway's Fosen Mek Verksteder A/S Shipyard. "The alliance with Residensea was a natural one for Silversea to consider," said Smith. "As purveyors of luxury, both companies have a clear understanding of what today's affluent traveler wants, and each approaches the market with innovation and creativity. Our shared high standards of excellence will ensure a dynamic lifestyle for the residents and a unique travel experience for the visiting guests." Smith added, "The strength of this alliance introduces a whole new aspect to the cruise industry. The opportunities for the cross-selling and marketing of products between Silversea's ships and 'The World' will only serve to expand awareness of the ultra-luxury cruise market."

Residensea's CEO, **Fredy M. Dellis**, said, "Silversea was specifically selected to manage this project because of its stellar international reputation and its commitment to excellent service and attention to detail. Silversea is recognized as an innovator in the ultra-luxury

market, as is Residensea, and the synergies between the two companies will create a very powerful business partnership." The development of The World of Residensea has been enthusiastically received by the residents and the potential purchasers, as well as by the international investment community. Silversea is an equity partner in the project, which is now fully financed by prominent investors from the cruise, shipping

and hospitality industries, including: Residensea founder **Knut Kloster Jr.**; **Bryn Skaugen**, whose family played a role in establishing and developing Royal Caribbean Cruise Lines; **Petter C.G. Sundt**, of Bergesen d.y. ASA; **Atle Bergshaven**, owner of one of Norway's leading ship management companies and former vice president of the Norwegian Shipowners' Association; and **Einar Nagell-Erichsen**, a leading Nor-

wegian hospitality and travel industry developer. Further international investment capital has been provided by Continental Casualty Company, one of America's largest insurance companies and a wholly owned subsidiary of CNA Financial Corporation.

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Carnival Enters Final Negotiations For Newbuildings

Reports that Carnival may have ordered as many as eight new ships worth \$3 billion seem to be inaccurate, says a recently released cruise industry review published by Lazard Freres & Co. However, Carnival is reportedly very close to closing a deal for three new ships (with options for two more) for Holland America Line.

After discussions with Samsung, the contract seems to have shifted back to Fincantieri, which constructed most of the HAL fleet. The newbuildings are expected to have 1,800 berths, with as much as 90 percent of the cabins having verandas. Another order, reported to have been made with Kvaerner-Masa, also appears inaccurate, said Lazard Freres. It may have been confused with an existing order for three ships, known as the Project 8000 or Spirit class.

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Gulf of Mexico

Is It Back?

While many skeptics believe it is far too soon to dub seven months of good news as "Oil Boom ... Part II," there is plenty to cheer about in the Gulf of Mexico following two years in the doldrums.

To say the Gulf of Mexico maritime business had a down year would be a major understatement. But rags-to-riches-to-rags experience of the past has resulted in a consolidated, resourceful group of companies poised to pounce on the next market upturn ... which should be very soon.

The business trends of consolidation and globalization that have largely defined the late 1990s have touched every level of business in the U.S., including the Gulf of Mexico maritime industry. Companies that had largely depended on "business as usual" are generally out of business today. The result: a resilient industrial base that is poised to prosper in good times and bad.

"Business is bad right now, as the oilfield is our primary source of business," said **Ralston P. Cole**, vice president Gulf Coast Region, Stewart & Stevenson. Cole — who's marine industry career now spans more than three decades and countless market mood swings — noted that the company has diversified its business, including selling engines and equipment to new emerging markets such as Paraguay and Argentina, but that ultimately, the company's good years will coincide with the health of local boat, ship and rig builders. While he notes that South American business is currently only about 10 per-

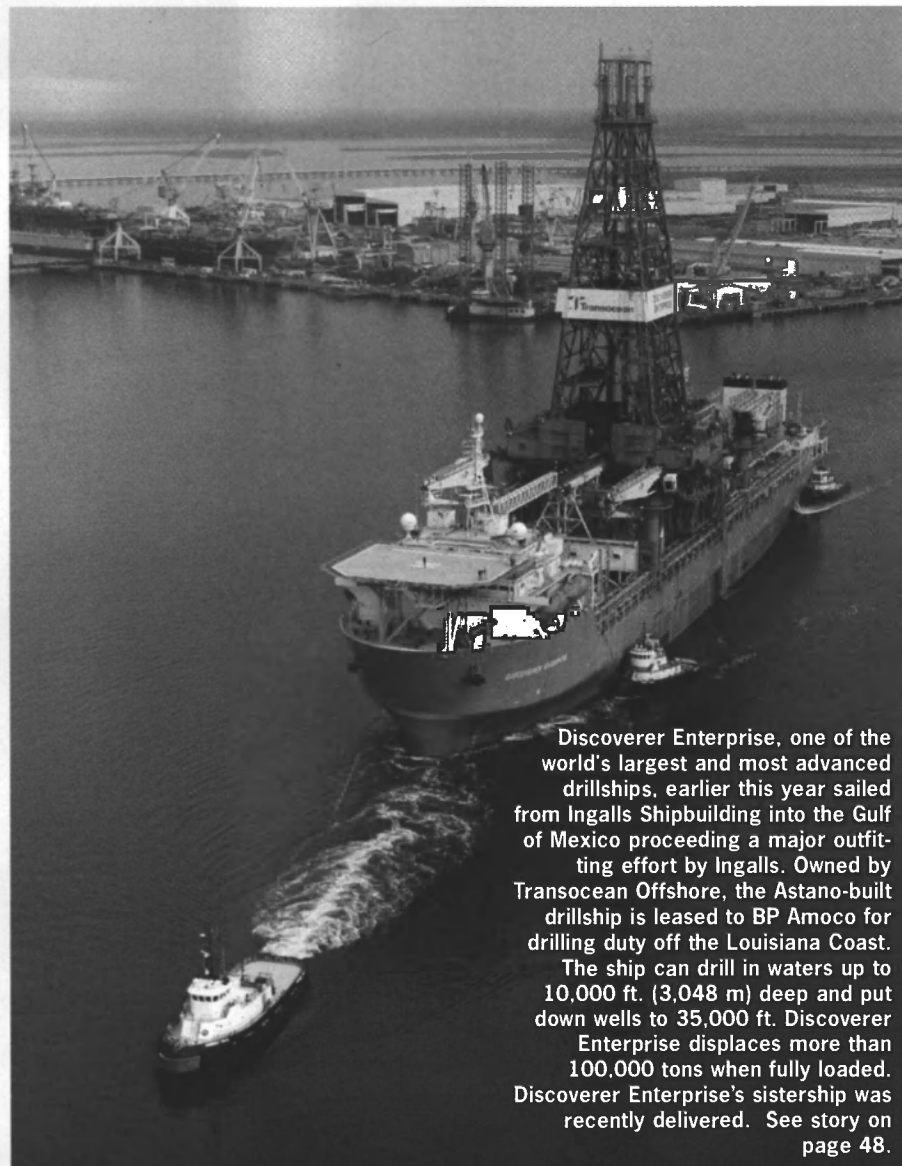
cent, it is significant because its is out of sync with the flow of the offshore rig market.

Despite newfound efficiencies and markets, as Cole notes, the region is still largely ruled by the price per barrel of oil. While the nearly two year oil price swoon has been reversed for much of 1999, rising from around \$10 per barrel in March to nearly \$25 per barrel in September, the general mood of area businesses is still cautious, as confidence is generally based on firm orders in hand rather than slick market projections.

This caution has proven to be prudent.

While the stock market — the global business measuring stick — has generally been positive on the offshore oilfield sector throughout much of the year, there has been a relapse of sorts in October, as uncertainty surrounding OPEC output quotas has largely dampened the year's progress. In fact, a major tracker of offshore industry stocks, Warburg Dillon Read, in mid-October cut its ratings of four oilfield equipment and services companies. Among individual factors, Warburg cited expectations of flat oil rig demand everywhere except the Gulf of Mexico.

Global Marine Inc. was cut to "hold" from "buy," based on delays in the construction of two new drillships, the CR Luigs and Jack Ryan, and the resulting



Discoverer Enterprise, one of the world's largest and most advanced drillships, earlier this year sailed from Ingalls Shipbuilding into the Gulf of Mexico proceeding a major outfitting effort by Ingalls. Owned by Transocean Offshore, the Astano-built drillship is leased to BP Amoco for drilling duty off the Louisiana Coast. The ship can drill in waters up to 10,000 ft. (3,048 m) deep and put down wells to 35,000 ft. Discoverer Enterprise displaces more than 100,000 tons when fully loaded. Discoverer Enterprise's sistership was recently delivered. See story on page 48.

rising costs, Global's high 71 percent debt-to-equity ratio and the probability of negative cash flow in 2000 produced the downgrade; R&B Falcon Corp. cut to "hold" from "buy," due to the company's share price, the 2000 outlook for jackup and deepwater rig demand in Brazil, the North Sea, West Africa and the Gulf of Mexico and R&B Falcon's leveraged balance sheet; Transocean Offshore Inc. was cut to "hold" from "buy" with a 12-month price target of \$32 a share after its proposed merger with Sedco Forex, with the expectation the deal will close by the end of the year; and Diamond Offshore Drilling Corp. was cut to "hold" from "buy," with a 12-month price target of \$35.

Advancing the boatbuilding business

Impressions of the Gulf of Mexico vessel building businesses range from "mom-n-pop shop" to efficient, technically advanced shops. While there are still plenty of the former, the more accurate description today would have to be the latter, as there has been a significant amount of investment in the physical facilities and processes needed to build

vessels of all sizes and configurations competitively on the international market. Litton Ship Systems is the largest and perhaps best-recognized ship builder in the area, if for no other reason than the high recognition of its diverse defense-orientated parent, Litton. The company now includes both Avondale Industries and Ingalls Shipbuilding under the company banner, and is poised under the leadership of **Jerry St. Pe**. The company's navy newbuilding reputation is without equal, and Litton, with the recent acquisition of Avondale Industries, has expanded its capabilities significantly to aid its future naval and commercial prospects. "I'm excited about the opportunities. The Avondale merger allows for the pursuit of programs that one yard alone could not," said **Richard Schenk**, vice president of business development.

Aside from the company's work for the navy — which is 90 percent of Ingalls Shipbuilding's business and includes unparalleled success in building the Navy's advanced Aegis Destroyers, as well as preparing to commence production of the new DD21 class, as well as a



Alabama Shipyard, a perennial commercial construction leader, has struck again with its in-house designed ATB Unit. The new ATB — the first of which (Alabama 135) is under construction for Reinauer Transportation Co. — specifically targets the ripe U.S.-flag Jones Act shipping market. Engineered to be a flexible platform, able to be configured to meet most any need, the vessel is available in a variety of sizes as a petroleum tanker, feeder container-ship or drybulk carrier. The double hull OPA-90 compliant barge features the patented Intercon Coupler System.

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Gulf of Mexico

host of other navy combatant and support vessels — its yards are currently building two of the more high-profile commercial projects — the AMCV cruise ships at Ingalls and the ARCO tankers at Litton Avondale — in the U.S. today. The AMCV project is significant on many counts, and has garnered gen-


erous coverage in these pages. But to recap, the cruise ships will be the largest ever built in the U.S. and represent the first cruise ship construction in more than 40 years. To say that all eyes are on Pascagoula is a gross understatement, as supporters and pundits alike watch the ships develop. In New Orleans, the first

of the technically advanced Millennium class tankers is nearing completion for ARCO. The ships, which offer redundant systems throughout, are considered to be one of the more technologically advanced tanker projects in the world.

Ingalls Shipbuilding was able to make significant in-roads during the last off-

shore vessel and rig building boom, and is well positioned to weather the market downturn while being prepared for the fast ramp up. It's work in this area included eight months of outfitting and final prep work on the 100,000 ton Discoverer Enterprise. Work included lifting the 2,250 ton substructure drill floor onto the drilling ship, and conducting test and trial to ensure the ship was "drill ready" for Amoco.

(Continued on page 105)



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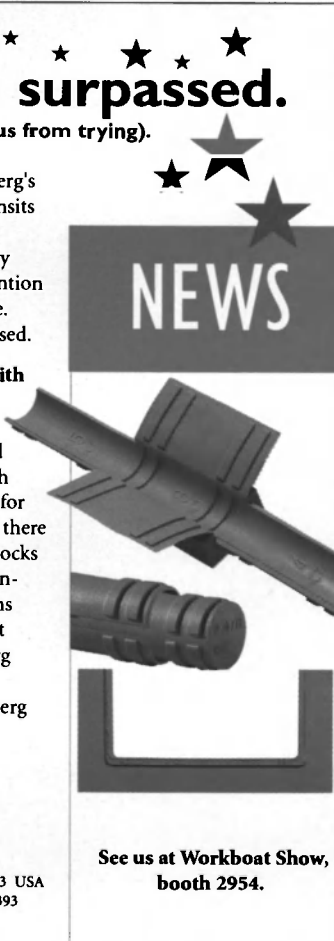
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NEWS

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One Piece At A Time

Haley Marine Gear has prospered in the business of selling high quality propulsion products for installation on workboats in the 1,000 to 6,000 hp range for nearly 27 years. While the company was "built one day, one piece at a time" and founded largely on mechanical and engineering expertise, **Kyle Haley** accurately points out that "we're not just a bunch of wrench turners ... we are original equipment manufacturers." Haley Marine Gear has positioned itself as a one-stop-shop, manufacturing clutches, couplings and gears to create a unified power package. **Ray Haley**, who founded the business and comes from a diesel engine business background, sought to build a company, which not only built and delivered the highest quality products, but built long-term relationships with its customers by servicing these products with the same quality and attention with, which they were built: anytime, anywhere. The attitude is clearly evident in the first question asked of potential new employees to gauge their technical aptitude. "I ask 'can you tear down a Detroit Diesel engine and rebuild it back up so that it will run?' If they can, I'll send them out in two years by themselves on a job," Haley said. The company, which includes Haley Marine Gear, Haley Clutch & Co. and Haley Marine Gears Intl. has operations around the world. This global positioning is evident in the company's recent agreement with ATA Gears of Finland — a large supplier of parts for Z-drives — which will position Haley to service the burgeoning number of boats with this propulsion system.


The Haley hallmark, of course, is being selected for inclusion on technically challenging jobs, as it was on the current newbuilt Vera Bisso, under construction at Bollinger. (See *MR/EN*, October 1999, p. 40). Vera Bisso features the "total Haley concept," in that it includes Hatch & Kirk engines with the Haley-make flywheels, the Haley HRC Torsional Coupling; the Haley TR Clutch; the Haley FMC Series gearbox; and a Haley shaft.

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A Cut Above The Rest

Improved steel processing — from cutting through parts marking to final installation — more so than ever determine's a yard's marketability, efficiency and profitability. Gulf of Mexico shipyards have made major investments in steel processing in recent years, investments which should start yielding big dividends.

Advances in steel processing have enabled shipyards around the globe to streamline operations while vastly improving efficiency and quality. This fact is not lost on the shipyards of the Gulf of Mexico region, which in recent years have invested tens of millions of dollars in advanced systems designed to propel their yards into world class levels of quality and efficiency.

Bender: Breaking out of the "Second Tier" Image

Bender Shipbuilding's transformation from a so-called "second tier" shipyard into a world-class facility is hinged on the success of its newly opened First Operations Shop. The new facility, which features the installation of a high powered laser cutting machine, will include operations such as raw plate and profile receipt and storage, blasting and



Steiner Shipyard has diversified its operations with the creation and launch of Enviro-Metals, Inc., a new steel processing company which will feed the steel needs of Steiner and other area boat builders and repairers. As the EPA rules regarding metal processing continue to tighten, Steiner stands to make full use of the facility as many area facilities are simply not in the financial position to process their own steel while complying with the new rules. The facility features a Wheelabrator metal processing unit, housed in the above (yet to be completed at time of photo) enclosed facility.

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primer painting plate and profiles, plate cutting, part forming, profile cutting and forming, part identification, part kitting, and delivery of kitted parts to downstream processes.

Prior to the First Operations Shop, Bender had no in-house plate cutting capability. In selecting the laser system, Bender has effectively positioned itself to prosper for many years to come. Bender can attribute part of the success of opening the new shop with its collaborations with Caterpillar, which though a Maritech project, provided Bender with a full set of technical data which was key in ascertaining Bender's needs in terms of quality and speed. In addition, Caterpillar transferred a proprietary

technology of tab & slot and twist tab joining designs to Bender Shipbuilding, a technology which is enabled by the precision and cut quality of the laser. Bender tabs the technology as a significant enhancement to the way in which ships are designed and built, and the concept was presented to ABS for strength and fatigue tests. The results were successful, and now Bender will petition ABS to formally approve the joint design and allow its use in selected applications.

To investigate which cutting solution would be best for Bender, executives embarked on an international tour of yards in Europe and Asia, as well as

(Continued on page 111)

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Seacraft Delivers Laurie Tide On Schedule

In addition to delivering Laurie Tide on schedule, Seacraft Shipyard also surpassed all contractual vessel performance requirements. The vessel holds a top speed of 30 knots, a normal operat-

ing speed of 28.5 knots and a contract loaded speed of 27.5 knots; Laurie Tide is the fastest 115 ft. (35 m) class, propeller driven monohull, oilfield crew boat ever built, says the company. USCG-approved for 200 miles offshore and ABS classed, the vessel is powered

by three Cummins engines producing 1,350-hp each closed coupled to a Reintjes Marine Gear. Electrical power plants consist of two Cummins 4 BT 3.9 engines coupled to a Newage Stamford 50 kW generator supplying electricity throughout the vessel. The pilothouse is



fully equipped with the latest electronic equipment, which includes two radars, GPS navigator, navtex receiver and color video sounders — all supplied by Furuno.

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Astilleros Delivers Discoverer Spirit

Astano, the Astilleros Espanoles offshore construction yard, has sent off Discoverer Spirit to American owner and operator Transocean Offshore.

The second of a trio of ultradeep waters dual-drilling monohull vessels, Spirit departed on October 6 for the Gulf of Mexico. The vessel joins Discoverer Enterprise - the first member of the series. The last part of the series, Discover Deep Seas is currently under construction.

Scheduled for operation in the Gulf of Mexico by Transocean for U.S.-based Unocal, Discover Spirit boasts the cost-effective Astano design, which is identical to Discover Enterprise. The vessel measures 837 ft. (255 m) and has a breadth of 125 ft. (38 m) with a crude oil storage capacity of 144,000 bb/d. The unit provides a total variable deck load of 20,000 tons for the drilling equipment and topsides modules. All three units in this series, which are capable of working in 9,842 ft. (3,000 m) of water in tough conditions up to 70 km/h winds and 15 ft. (4.6 m) waves, also have the operational capacity and position in harsh environments up to 150 km/h winds and 39 ft. (12 m) waves.

Classified by DNV, Discoverer Spirit complies with the U.S. Coast Guard regulations for the Gulf of Mexico.

The Astano-designed two-deck layout consists of the riser rack on top of the engine and power generation rooms on rear of the upper level, with the lower level comprised of water and ballast tanks.

With a dynamic positioning system driven by six thrusters, each with an output of 5.5 MW, the units house dual activity drilling - twin derricks and two complete drillstrings. Power generation is granted by six diesel sets, four outputting 7.5 MW and two 5MW. With the series designated for 20 years service, Astano installed all above-mentioned equipment at the rear of the vessel.

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Catching the (First) Wave

Newpark Shipbuilding has increased its portfolio of businesses from one to six in the past 18 months, but don't expect this Houston-Galveston region company to rest on its laurels. More growth is expected and planned.

— by Chris Palermo, managing editor, **MarineNews**



With six facilities in two areas — three each in Houston and Galveston — Newpark Shipbuilding's "network" is able to offer customers repair, construction and conversion of boats, barges, ships and offshore drilling rigs.

Newpark Shipbuilding was formed in the early 1990s by Sam and Frank Eakin. The Eakins, with an investment banking background, saw opportunity in the Houston-Galveston area for consolidation amidst the fragmented shipbuilding industry. The Eakin's goal was a strong shipyard network.

Less than a decade later, Newpark Shipbuilding has acquired enough yards to constitute what the company refers to as a "shipbuilding network." Altogether, six facilities have been acquired in the Houston-Galveston area, employing more than 1,200 people.

The full service commercial shipyard features product and geographic diversification. There are no "specialties" here; the company is active in the repair, construction and conversion of boats, barges, ships and offshore drilling rigs.

The first yard Newpark acquired was on Brady Island, in the Houston Ship Channel. The yard instantly carried the name "Newpark," and was followed by two other acquisitions in the Houston area — Greens Bayou and Pasadena. In addition, the company acquired three yards in the Galveston area: Galveston



The Brady Island facility was Newpark Shipbuilding's first acquisition, and is the focus of the company's inland operations along the Houston Ship Channel.

Island, and the East Yard and West Yard facilities on Pelican Island.

Today, the company's headquarters — First Wave, a holding company — in Houston. The East Pelican Island facili-

ty is the focus of the Galveston, or offshore, operations; while Brady Island is the focus of the inland operations.

Even though Newpark acquired existing shipyards — for example, the East

Pelican Island facility was once owned by Todd Shipbuilding - it didn't mean the shipyards were fully functional from the start.

"We put a lot of money into the shipyards," says **Don Francis**, director of marketing, Newpark Shipbuilding. "For example, we've put nearly \$30 million into the East Pelican Island facility. When we acquired the yard, it was in



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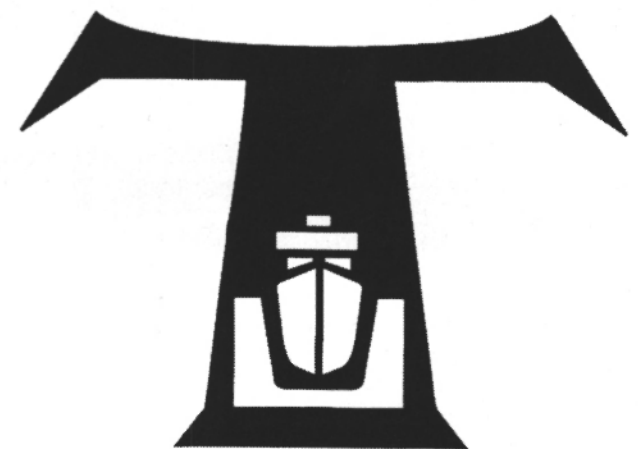
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bad shape; it needed everything."

Francis added: "We had to repower the yard, run new electric. New plumbing was installed. Then, we set to work on upgrading the shipyard capabilities. We increased the crane capacity, overhauled the drydocks — there was a lot of remodeling. We enlarged and lengthened some piers. We dredged."

"Now, we have a yard where the longest pier is 1,125 ft. (342.9 m), with a 40 ft. (12.1 m) water depth. The yard can do topside work and small ship drydock repair," Francis says. "We're acquiring a Panamax-sized drydock, and once that's in place, we'll be able to accommodate 85 percent of all the ships transiting the Gulf of Mexico."

Repairs are sure to become an even more integral part of Newport's focus. As Francis points out, OSV construction has slowed, in response to the struggling oil price, "but that market always changes," he says. "It's down now, it'll be back up again."

Instead, Francis is eyeing the tank barge conversions, mandated by OPA 90, as one of the major projects the company is planning and preparing for.

"The tank barge conversions have a deadline, as set forth in OPA 90," says Francis. "We haven't seen a lot of that work yet, so we're guessing between now and the deadlines, we'll start to see progressively more of it and we're certainly making it a priority to pursue that work."

Additionally, as ship traffic in major ports increases, so does the demand for ship repair. Francis says the company is fully aware of the increasing traffic, and is developing its ship repair facilities to match that expected increased demand.

Short-term, Francis says the slumping oil price will only continue to foster an environment prone to consolidation. On a longer-term level, obviously, the oil price will rebound, especially, Francis says, on the deepwater side.

He also points to a growing industry trend towards replacing coastal freighters with ITBs, which certainly bodes well for the company. Matters of concern to Newport are the continuing environmental pressures, as well as government regulations — especially the debates surrounding the Jones Act, and the contested and proposed reforms, called for yearly by lobbying groups, he says.

Overcoming Obstacles

"The biggest obstacle we've faced so far, from a corporate viewpoint, is integrating the six yards into one," says Francis. "Our corporate business systems are shared by all the yards. We think of the yards as a shipyard network,

and integrating those has been a huge challenge. We're building our computer networks, and finalizing the integration, but, really, you never quite finish when you're improving efficiency."

The computer network encompasses the yards, the accounting systems, the

reporting systems and the entire management organization.

Grady Walker, executive vice president of the inland division, echoes Francis' sentiments. "We went from one to six yards in the past 18 months. Until the cultural evolution of merging the six

different yards into one is completed, there's always a challenge.

"Now, with the six different yards, each with its own area of expertise, we're able to package our services. We can offer 'one-stop shopping.' For example, when we acquired the John Blud-

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Ask your engine supplier at Fish Expo and WorkBoat if his engine has all these features. When he says no, come visit our booth.

Actually, it's not a fair question. No other engine line has engines with all these features. So you can skip their displays and come straight to the Luggar booth.



Nodular Iron Pistons.

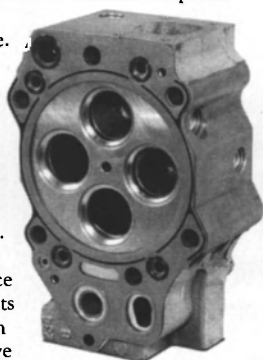
Luggar 125, 140 and 170 series have one-piece, nodular iron pistons. This metallurgical breakthrough gives you more power, longer engine life and lower fuel costs than engines with aluminum pistons. • One-piece design eliminates failures associated with two piece pistons. • Combustion chamber with centered fuel injection point thoroughly mixes fuel and air for more complete, clean combustion and fuel economy. • Iron is stronger than aluminum, allowing the top compression ring to be closer to the piston crown. The combustion dead zone is minimized and fuel economy is increased. • Equal thermal expansion of the piston and liner allows a closer fit reducing piston slap. • Keystone shaped compression rings reduce carbon buildup and ring sticking during light load and idle speed operation. • Oil sprayed into the piston gallery cools the piston crown, allowing higher combustion temperatures for more power output per c.i.d., less exhaust smoke and more

efficient use of fuel. • Tuftride nitrate surface treatment holds lube oil and prevents scuffing. • Massive wrist pin and wedge-shaped connecting rod boss increases bearing area to carry higher firing load. • Strong but light. A 700 HP Luggar iron piston weighs only 8.7 pounds. A competitive aluminum piston is 7.6 pounds and a two part steel/aluminum is 9.7 pounds.

Individual Cylinder Heads.

Luggar 125, 140 and 170 series have one cylinder head per piston to increase the power output without reducing engine life.

They also dramatically reduce service and rebuild costs. • Individual heads are smaller to minimize warping from thermal stress. The small head-to-block mating surface and seven head bolts in a circular pattern give a more effective combustion chamber seal. • Individual heads allow one cylinder to be rebuilt without disturbing the rest. The piston, rod, liner and rod bearing of one cylinder can be replaced, in the boat. • Luggar heads are interchangeable. If you have an extra one on board you can rebuild any cylinder. Light too. One person can lift it on and off the engine. • Cross-flow design is more efficient. Intake on one side and exhaust on the other simplifies the engine design. • Four internal coolant channels cool the "bridge" between the

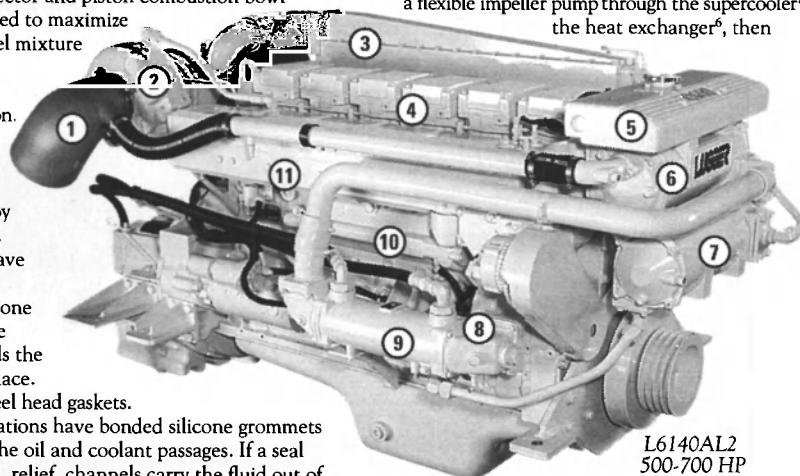


valves and around the injector tip to prevent bridge cracks, a common failure on some engines. • Rocker arm cover floats on o-ring seals to isolate it from the head and to reduce valve train noise transfer. • Four valves (two intake and two exhaust) improve engine breathing. More air in, more power out. • Steel alloy valves have chrome plated stems for longer life. • Fuel injector and piston combustion bowl are centered to maximize air and fuel mixture for more complete combustion.

• A "dropped valve" can destroy an engine. Luggars have dual valve springs. If one breaks, the other holds the valve in place. • Solid steel head gaskets. All perforations have bonded silicone grommets that seal the oil and coolant passages. If a seal should fail, relief channels carry the fluid out of the engine to avoid mixture of coolant and oil. • Valve seats and guides are replaceable. The head can be rebuilt again and again. • "Ultra-Smooth" dual intake ports swirl intake air for more complete combustion. • Short exhaust port minimizes the heat transferred to head and maximizes the energy delivered to the liquid cooled turbocharger.

Cooling/Warming System

The Luggar cooling system cools or warms different engine components to keep them at their optimum operating temperature. Take the 700 HP, 15 liter L6140AL2 as an example. • We offer keel cooled or heat exchanger configurations. • Keel cooled engines require only one keel cooler. • Up to 82 gpm of sea water is pumped by a flexible impeller pump through the supercooler⁷, the heat exchanger⁶, then



L6140AL2
500-700 HP

overboard through the wet exhaust¹. It never touches the engine block or after-cooler³. The seawater pump is gear driven so there are no belts to fail. It has a ceramic mechanical seal and is completely rebuildable. • The supercooler⁷, heat exchanger⁶ and marine gear oil cooler⁹ all have 70/30 cupronickel tube bundles to better resist corrosion. The end caps and tube bundles are removable for easy cleaning. The sea water weaves a three pass path through the heat exchanger to maximize heat transfer. • The super-cooler⁷ and large capacity, plate and fin aftercooler³ use fresh jacket water to control intake air temperature. This eliminates the

problems of sea water aftercoolers; over cooling under light loads, white smoke, corrosion and element clogging mineral deposits. • We eliminated as many hoses, clamps and gasket surfaces as possible. Many of the remaining connections are positive sealing, pipe and o-ring type. • The expansion tank⁵ is cast from 356T6 aluminum so there are no welds to break or leak. • The plate-type oil cooler¹⁰ is built into the block to further reduce external plumbing. The cooler has its own thermostat to keep the engine oil at the optimum temperature. • The gear oil cooler⁹ uses thermostatically controlled freshwater to cool or warm the marine gear oil as needed. This eliminates condensation...

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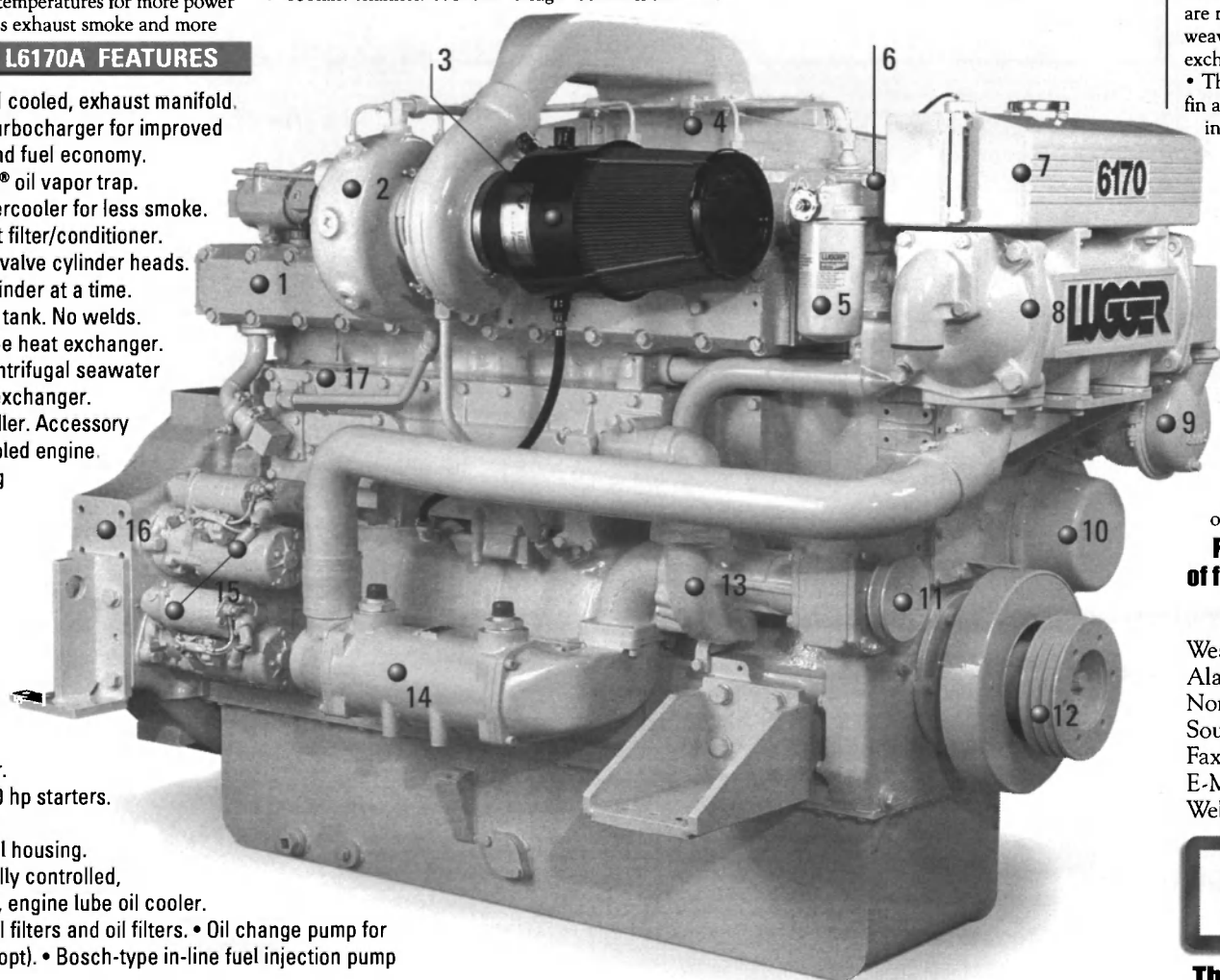


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13. Gear-driven freshwater coolant pump.
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• Dual spin-on fuel filters and oil filters. • Oil change pump for engine and gear (opt). • Bosch-type in-line fuel injection pump



Gulf of Mexico

worth yard in Pasadena, we got the best inland pushboat facility in the area, bar none. With the Galveston Island facility now a dedicated barge new-construction facility, we were able to go back to customers and offer a full package of boat, barge and cleaning.

On the shipbuilding side, Walker says there have been "hundreds of little opportunities we've capitalized on," as the company continues to establish its own "best practices," and then, improve on those new standards.

"When we bought the old Trinity facility at Greens Bayou, which had built a lot of barges, it had a reputation of being an efficient yard," says Walker. "We were able to increase the efficiency by doubling the module size produced in the shop before going to the field for erection. We took more advantage of the automatic process in the shop, and cut the amount of man-hours needed to build a barge by 10 percent, which is a substantial savings in the newbuild world."

With six facilities in the area — the West and East Pelican Island facilities are adjacent, and the Galveston and Houston facilities are all within 15 minutes of each other — the furthest ride is from the Houston group to the Galveston group, which can be done in under an hour.

"That geographic proximity allows us to maintain a stable labor base," says Francis. "If business gets soft at one facility, we can ship our labor around. We're able to retain our good workforce."

"We shift our resources quite frequently," adds Walker, "and we can pull our resources from a number of yards quickly. We can meet special turnaround requirements and resource needs. When we've had big rig jobs, we've taken manpower out of our inland division and sent them to Galveston, and the process works in reverse, as well."

Expansion Still Planned

Newpark Shipbuilding still anticipates growth. "We want to diversify geographically," Francis says. "We've done — and we're still doing — a good job of diversifying by product line, now we want to diversify geographically."

"However, the expansion has to fit our culture. We're not just going to run out and buy a yard because it's for sale. We're still exploring opportunities that complement our existing yards. There are opportunities out there in ship repair and tank barge conversions, ocean barge conversions. We'll continue to do a good business in barge construction and barge repair, and we think our tug new-con-

struction business will grow this coming year, as well. Obviously, given our location, OSVs are always a possibility for booming growth.

"Currently, we do everything but military work, although, we're pursuing that now, as well," Francis says. "There's a lot of opportunities in custom fabrica-

tion. We have substantial fabrication capacity, and we're in the process of developing a separate business line, for customers both inside and outside the marine industry. We have a large crane capacity, a large fabrication space under-roof, and a large coverslip, so shipping large structures is not a prob-

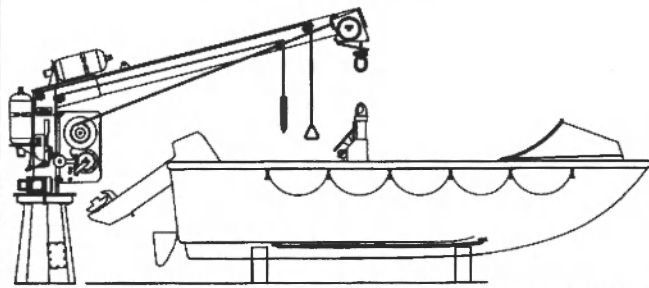
lem. Additionally, that will be one more facet of our business."

And as the company expands its market focus, its areas of business and, potentially, its geographic presence, it is now starting to expand and increase its efforts at marketing and affecting public perception.

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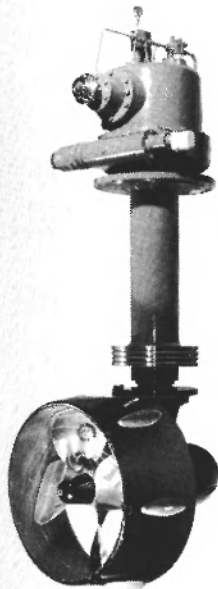


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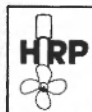
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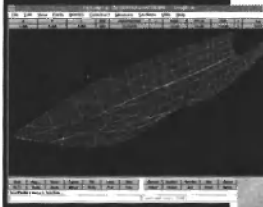
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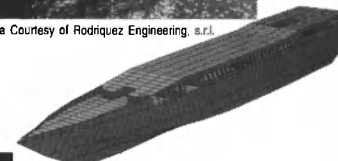
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TDI-Halter Builds First Super 116-C Jackup Rig

TDI-Halter, the Offshore Division of Halter Marine Group, Inc., recently completed the new construction of the first LeTourneau Super 116-C design jackup drilling rig for Perforadora Central, S.A. de C.V. The jackup was christened Tonalá by **Gabriela Alvarez-Morphy**, wife of **Patricio Alvarez-Morphy**, president and CEO.

Halter utilized its rig and marine shipyards for the construction of Tonalá. The three 46 ft. diameter spudcans, built at the South Yard, and three 477 ft. (145.3 m) long legs, fabricated at the Orange Yard, were built in Texas and transported by barge to the Pascagoula facility. The wingtank modules and accommodation block were built in Mississippi at Halter's Gulfport facility.

The cantilever beams were fabricated by Superior Fabricators in Louisiana, and installed in Pascagoula. All other hull modules, heliport, drill floor, etc., were built and assembled at the Pascagoula facility in Mississippi.

The hull of Tonalá was built on conventional blocks, several hundred feet from the shoreline. In February, the team launched the rig into Bayou Casotte. The rig was essentially complete at time of load-out, missing only the drill floor and the upper sections of the leg. With the rig along the shoreline, crews completed the installation of the legs, drill floor and derrick, followed by final outfitting, testing and commissioning. The rig is capable of both exploration and development drilling. Extended cantilever reach to 70 ft. (21.3 m) makes it an excellent tool for drilling on fixed platforms. The jackup has a total steel weight of 7,370 short tons. Tonalá is built to operate in 48 ft. (14.6 m) waves and 70 knot winds in 350 ft. (106.6 m) water depth, and can survive 56 ft. (17 m) waves and 100 knot winds. The three-level quarters with accommodations for 94 persons and six-person hospital is complete with a dual galley, dual dining rooms and recreational facilities.

Circle 199 on Reader Service Card

Bay-Houston Christens Tug

Haden II, the 12th tug for Bay-Houston Towing Company, was christened in Galveston. Designed in-house in coordination with Schuller & Allan, Inc., the 3,900 bhp tug is designed primarily for ship docking, but also has general towing capabilities. The vessel was built by Main Iron Works, and will service the ports of Houston and Galveston. Design criteria was developed to enhance the most important functions of the tug's mission: high maneuverability, coupled with maximum bollard pull (thrust).

Circle 95 on Reader Service Card

New Inland Barge Drilling Rig

Parker Drilling Co. received the newest member of the Parker international drilling fleet, drilling barge rig #75. Built by Oil Barges, Inc., the shallow-water drilling rig commenced drilling operations in mid-August.

The rig has a 25,000 ft. (7,620 m), drilling depth rating with an SCR drive system. All drilling and mud processing equipment is installed on a multi-level barge measuring 240 ft. long and 70 ft. wide. The barge also includes an 82-person accommodation facility.

Other innovative design features include a draft of less than 8.5 ft., permitting reduced dredging costs; a 50 ft. (clear height) substructure, permitting simultaneous drilling and workover operations; a skiddable substructure that will provide access to six potential wells without repositioning the barge; and the ability to drill all six wells without raising/lowering the derrick or laying down drill pipe.

Circle 198 on Reader Service Card

MMS Awards Contract for Royalty Reengineering

The U.S. Department of the Interior's Minerals Management Service awarded a \$47 million, seven-year contract to Andersen Consulting to develop, install and operate an integrated financial system that will improve the Federal government's Royalty Management Program (RMP). With the signing of this contract, MMS fully enters the implementation phase of its reengineering initiative, which was spurred by aging computer systems, changing energy markets, and the need to place its business enterprise on business cycles and processes that better align with industry and financial institutions.

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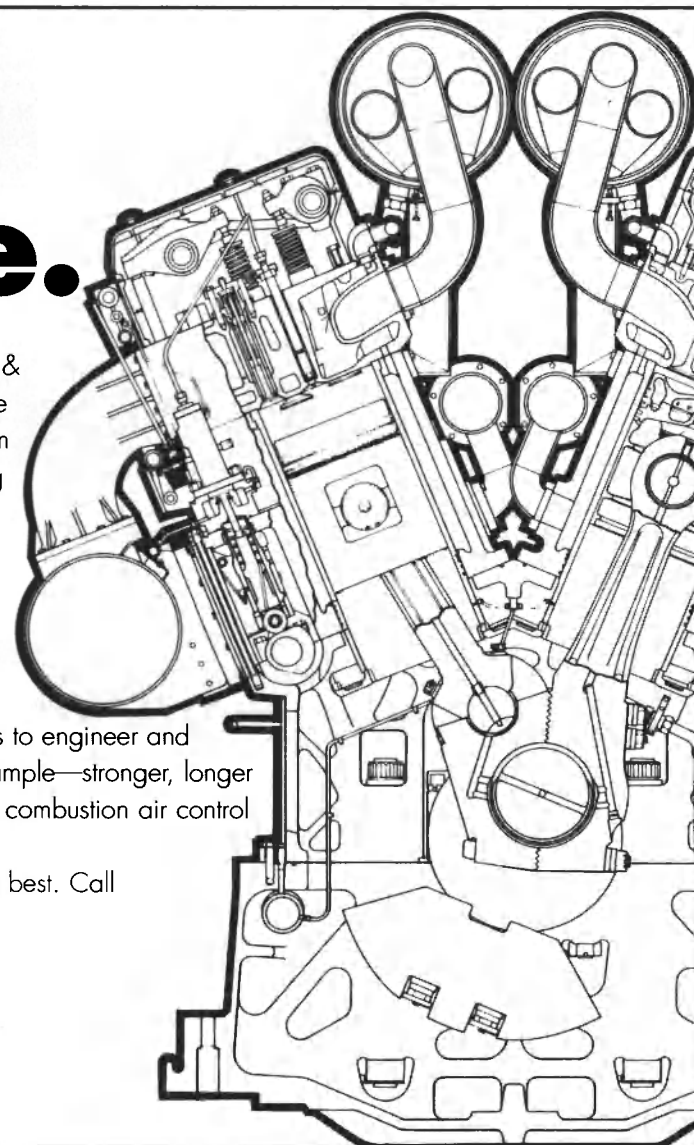
The Enterprise; a powerful engine that has a long and proud history. The Enterprise Engine & Machinery Company began manufacturing engines in the 1920's for stationary and marine service. Humble beginnings for an engine that evolved into one of the most reliable medium diesel engines of today. Enterprise engines continue to operate around the world, providing power for industrial plants, third world countries, electric generation, main propulsion in ships, municipal power plants, and in nuclear stand-by service. A proven workhorse, the Enterprise is one solid piece of engineering. This explains why so many are still in operation some 10 years after production ceased.

Many outlets offer limited parts and service for the Enterprise, but only one has dedicated it's entire operation to this great engine: **Powerhouse Diesel Services**. Powerhouse not only stocks over 5000 different parts for the Enterprise series, but continues to engineer and perfect parts to optimize efficiency and reliability. A head subcover redesign is a good example—stronger, longer lasting without changing the original configuration. Or Powerhouse Intellitronics gas engine combustion air control systems automatically optimizes air/fuel ratio regardless of site specific conditions.

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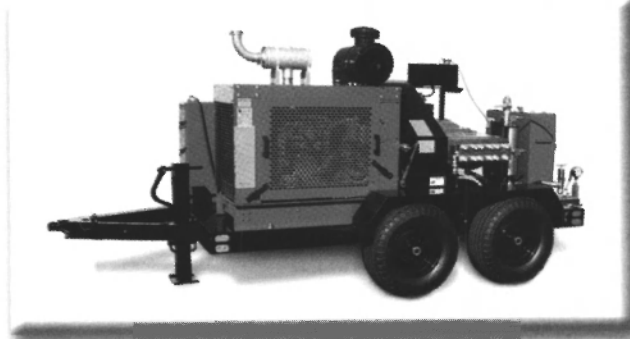


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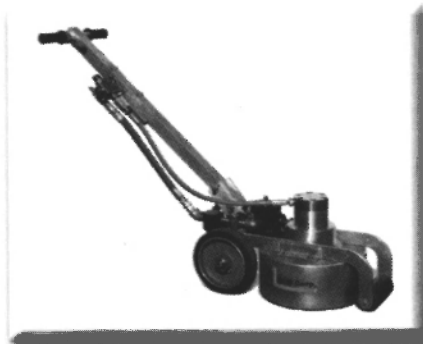
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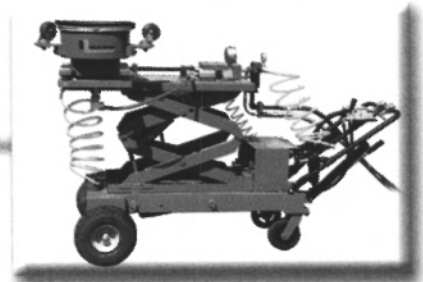
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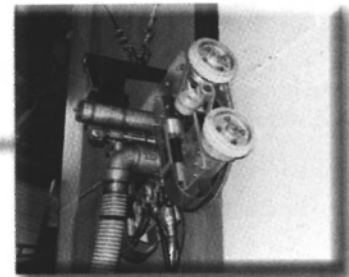
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Circle 30: on Reader Service Card

Gulf of Mexico

Bollinger Launches USS Tornado

Bollinger Shipyards, Lockport, La. has launched USS Tornado, the U.S. Navy's newest Patrol Coastal Ship. The 14th of the Cyclone Class constructed by Bollinger, under a sole-source contract with the Navy, the vessel is the first

to include design modifications, equipment and armament upgrades as part of the Navy's Pre-Planned Product Improvement Program. Boasting a new, fully integrated bridge command and control system to increase the vessel's capabilities, Tornado is equipped with a satellite navigation system, forward looking infrared and surface radar with

collision avoidance capabilities.

The vessel is based on the Vosper Thornycroft Ramadan class design and modified to meet Navy requirements. One specific change is the extension of the stern, which includes a ramp for the launch and recovery, while underway, of naval special warfare boats. As a result of this process, Tornado increased in



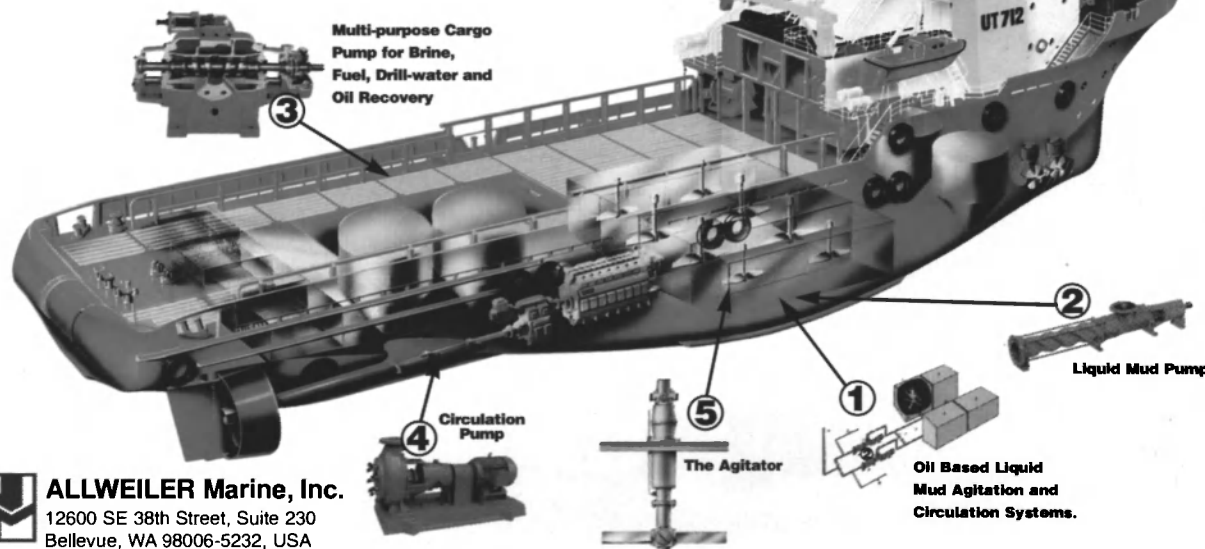
length to 179 ft. (54.5 m) from the 170 ft. (51.8 m) earlier models. Featuring hulls and main decks made of steel and aluminum super-

structures; Tornado is fully operational through Sea Sate 3 with a 26 ft. beam and a draft of less than 8 ft. It is powered by four Paxman diesel engines developing a total of 13,400-hp, driving four 42 in. diameter propellers through Reintjes gears. Electrical power is provided by two 150 kW Caterpillar generators and the vessel's continuous speed is above 35 knots, and maximum range at 12 knots is more than 2,500 nautical miles. The vessel has a displacement of 360 long tons light ship and is scheduled for deliver in Spring 2000.

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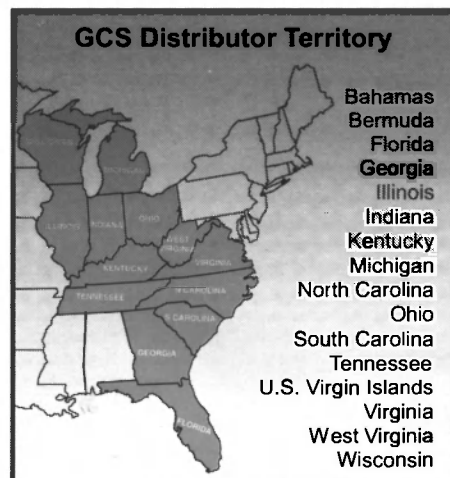


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Tug Repowered By C.R. Harbour Towing



C.R. Harbour Towing and Transportation LLC recently completed the repowering and refurbishment of 95-ft. (28.9 ft.) tug Brandon C. Roehrig. The tug's original Cat D-398s were removed, and a pair of 3,300 hp Cat 3512Bs were installed, coupled to a pair of Haley DRV-1711 6:1 hydraulic reduction gears. Also fitted were a set of Bird Johnson 96 in. five-bladed New Generation work wheels. An articulating upper house pilothouse, with a 44 ft. (13.4 m) height of eye, was added. The house folds down to give the tug an air draft of 34 in., thus allowing the tug to clear most of the lift bridges in the port of New York. Other work included the remodeling of the living quarters, galley and pilothouse. A new electronics package — including Furuno D-GPS, Autopilot, Radars, SEA-156 VHF's and SSB radios and Sperry Gyro — was also installed.

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Products & Services Guide

(Continued from page 40)

developing safety devices. Our Marine Division products meet all U.S.C.G. navigation regulations and include barge, platform buoy and anchor lighting as well as custom designs.

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Douglas Glass & Manufacturing's Marine Door Model 116 includes the following features: all aluminum with power coat finish, 1/8" aluminum panels with 1/2" wood core, and big thermal window - 2 PC 1/4" safety glass. Plus, stock & custom sizes. Call 1-800-567-7409 or

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Schuyler Rubber Company

Schuyler Rubber Company designs and manufactures proprietary laminated rubber fendering systems for tugs, barges, workboats, drilling rigs, docks, piers, and other marine vessels and offshore facilities. Schuyler Rubber Company is located in the Seattle, WA area and has serviced the private and military industries since 1950.

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This four-page color catalog introduces the RATO couplings for diesel and electric motor-driven equipment such as marine propulsion, compressors and two-bearing generators. Includes VULKAN Couplings for shock absorbing, alignment correcting and torsional vibration control.

Circle No. 116

MMC International

MMC International Corp. manufactures portable restricted gauging tapes designed for speed, simplicity and accuracy. A Restricted Trimode (UTI) measures ullage, tem-

perature and interface with a single penetration through an MMC vapor control valve. Ideal for shipboard tanks. U/I, oxygen-sensing and temperature-only models are also available.

Circle No. 117

Electronic Marine Systems, Inc.

Big Blue, manufactured by Electronic Marine Systems, Inc., is designed for use by shipboard personnel to view the complete loading operation in one glance. It is built for the harshest environments of temperature, water, salt and vibration and is approved by both the ABS and USCG in full compliance for on-deck cargo operations.

Circle No. 118

GE Marine Engines

GE Marine Engines manufactures aeroderivative gas turbines for marine propulsion applications. These compact, efficient, reliable, clean and quiet packaged power plants, sold through Marine Systems Suppliers, are used to propel 400 military ships of 25 world navies and on 17 fast ferries and six new cruise ships. These engines range from 4 to 45MW output.

Circle No. 119

Phillystran, Inc.

Over 25 years of excellence in design, Manufacture and Service Phillystran, Inc. designs and manufactures synthetic fiber ropes & strength members from high tech fibers such as Kevlar, Technora, Twaron, Vectran, Spectra, and polyester. Phillystran ropes are in use for marine applications such as: mooring lines, winch lines, emergency tow lines, headlines, and deep-water mooring lines. Phillystran ropes are available with break strengths ranging from 100 pounds to over 3,000,000 pounds.

Circle No. 120

Baier Hatch Company

Baier Hatch Company manufactures a complete line of cast aluminum, steel, and stainless steel flush deck hatches. The product lines includes round, oval, hinged, liftout, and coaming hatches. The company maintains a large inventory of hatches and parts for immediate delivery.

Circle No. 121

Tuflex

Tuflex Rubber Flooring tiles for sports and commercial applications are proven in the industry since 1957. Tuflex tiles are manufactured 3/8" thick (9.5mm-ga.) to the highest quality standards. Tiles are 27" x 27" (686mm by 686mm) and are vulcanized recycled rubber. Tuflex is the sports floor of choice for 12 NFL, 6 NBA, 9 NHL and 14 major league baseball teams.

Circle No. 122

Albacore Research Ltd.

Albacore Research, founded in 1989, is dedicated to ship production software development.

Albacore Research's programs include: ShipConstructor, ShipCAM, CAD-Link, ShipReport, NC-Pyros.

Circle No. 123

Turbo USA, Inc.

Turbo USA — located in Booth number 1154 co-exhibiting with TurboNed B.V. — would like to welcome you to The International Workboat show in New Orleans. For the beginning of the New Millennium, you will be able visit our new web-site www.turbo-usa.com. It will provide everything you need to know about Turbo-USA, Inc. with just a click of a button. We look forward to your inquiries in our web-site in the near future.

Circle No. 124

H.O. Bostrom Co., Inc.

H.O. Bostrom has 50 years of innovative seating design and manufacturing experience. A H.O. Bostrom product includes SeaPost. SeaPost seat products are well-known and are highly recommended worldwide as the best choice.

Circle No. 125

Edgewater Machine & Fabricators

Specializing in equipment and products for the marine industry, Edgewater has over 40 years of marine experience. During these 40 years, we have produced over 2000 winches, davits, windlass and other deck handling equipment.

Circle No. 126

C-Map Commercial

C-Map Commercial markets the CM-93, which is a professional electronic charting database for the Americas. With its various locations worldwide, some of C-Map's recent additions to its product line include: Block Charts, which is for the Gulf of Mexico and Bathymetric Charts, developed for the Mid-atlantic, West Coast, Gulf of Alaska and Bering Sea.

Circle No. 127

Tech Power Controls Co.

Tech Power Controls (TPC) has gained a reputation as a company that "invents the un-invented" to solve unique SCR problems and improve drilling efficiency. TPC has specialized in electrical systems for the petroleum and marine industries. We offer reliable innovative, custom designed systems to meet any specifications for operations on land or offshore.

Circle No. 128

Proteus Engineering

Proteus Engineering's mission is to provide the finest software, technical support and engineering services in the fields of naval architecture, marine engineering, and materials engineering. Since its inception, Proteus has developed FlagShip, an integrated suite of discipline-specific software products that address the principle areas required for basic ship design and manufacturing. FlagShip and its components have over 1,000 users.

Circle No. 129

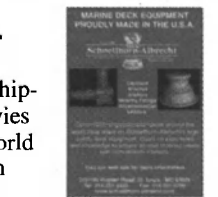
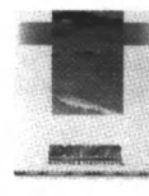
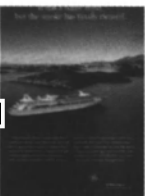
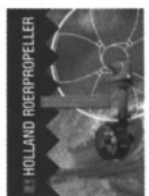
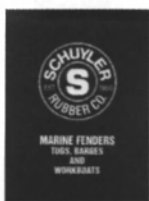
Schoellhorn-Albrecht

Since 1887, shipyards and navies around the world have relied on Schoellhorn-Albrecht's high-quality deck equipment. Count on experience and knowledge to answer all your mooring needs with Schoellhorn-Albrecht. Its products include: Capstans, Winches, Anchors, Mooring Fittings, and Ladders.

Circle No. 130

ITW Philadelphia Resins Corporation

ITW Philadelphia Resins' structural polymers and application expertise have been employed in all major shipbuilding facilities for



more than 40 years. Over 42,000 main propulsion systems (including 70,000 and 80,000 hp engines) and auxiliaries are installed with Chockfast Orange. Other products include: coatings, hull and rudder fairing compounds, non-skid deck and ramp coatings, machine repair putties and erosion-resistant resurfacers. **Circle No. 131**



Bollinger
Since 1946, the Bollinger name has been synonymous with quality of work, reliability of performance and excellence in craftsmanship. Bollinger has always meant innovation, fair price and family commitment. Bollinger provides the following services: repairs, conversion, newbuilds, ISO 9001 Certified Nine Gulf Coast Locations, 23 Drydocks — 8100 Ton Capacity, Full Service Machine, Electrical and Propeller Shops. **Circle 132**



Skookum
The latest addition to the line of blocks built by Skookum is the new 18" 25-ton BCM full-sided trawl block with improved wear resistant steel sheave. An additional feature is an elongated eye stem, designed to be stronger and longer lasting. Skookum is "engineered for extremes." **Circle No. 133**



ComNav
Since their introduction in 1982, ComNav Autopilots have been trusted worldwide for high performance and reliability. Backed by a 3 year warranty program, ComNav Autopilots and accessories will handle most applications. Regardless of vessel size, type or usage, this guide will help you select the correct options and features for your vessel. **Circle No. 134**



Jesse Engineering Co.
Jesse Engineering Co. is the manufacturer of Wallace Coast pipe fab. Equipment (storage, selection, cutting, flange welding, CNC bending, system integration, conveying cutting and beveling); Capital Material Handling cranes; Pipe Shop custom software; U.S. manufacturer of Odense Steel Shipyard



Auto Profile Cutting System. **Circle No. 135**

Autoship Systems
Autoship Systems Corporation is the world's leading developer of PC software for naval architects. Building on their expertise in hydrostatics software, Autoship created stowage planning software to meet shipping industry needs. Other Autoship software capabilities include hull design and surface modeling, resistance and powering prediction, and internal structural modeling. **Circle No. 136**



Aetna Engineering
Aetna Engineering delivers a precision state-of-the-art digital tachometer that takes all of the guesswork out of RPM measurement. No other instrument gives you all of these advantages: *Four large, easy-to-read digits. *Set RPM precisely for best fuel efficiency or ideal trolling speed. *Synchronize multiple engines effortlessly. *Easily detects changes in condition of engines and hull. **Circle No. 137**



In-Place Machining
Crankshaft Grinding and Main Journals while the Crankshaft is in the engine, Optical and Laser measurement of Main Bearing Bores, Line Boring, Metal stitch repair of broken or cracked Cast Iron, machining Water Jackets, all types of on-board machining is accomplished by In-Place Machining Company, phone: 414-562-2000; fax 414-265-1000. **Circle No. 138**



Dayton T. Brown
The Dayton T. Brown Engineering and Test Division is one of the most complete, independent engineering and testing facilities available in the U.S., providing objective independent test and engineering information for Fortune 1000 industrial and commercial companies, as well as defense and government entities. Dayton T. Brown tests include some of the following: Hammer Shock, Vibration, EMI/EMC and Climatics. **Circle No. 139**



J.W. Fishers
For over 30 years, J.W. Fishers

has specialized in the design and manufacture of reasonably priced, high tech underwater search equipment. The product line includes diver-held and boat-towed metal detectors, marine magnetometers, underwater camera systems, ROVs, and side scan sonars. **Circle No. 140**



Ballast Technologies
Ballast Technologies Inc. (BTI) has been the premier provider and installer of fixed ballast materials since 1983. The product Perma Ballast is widely acknowledged to be the quickest and most cost-effective method of ballast installation today. Our environmentally safe process and materials require minimal vessel modification. BTI's staff and crew are exclusively dedicated to the installation of fixed ballast, ensuring both quality products and a professional installation process. **Circle No. 141**



Waterman Supply Co.,
For over 35 years, Waterman Supply has been providing marine deck hardware and equipment. This includes new and used anchors - 50 to 60,000 lbs, chains, winches, windlasses, capstans, hatches, watertight doors, manhole covers, scuttles, portholes, panama chocks — double bits, single bits—cast steel cleats, and much more! **Circle No. 142**



Carrier Transicold
Even paradise needs an oasis. The perfect cruise. The perfect vacation. And in the heat of the day, passengers can escape to the perfect climate. Because you have Carrier air conditioning and refrigeration on board. Isn't that a comfort? We value your business. **Circle No. 143**



Kahlenberg Brothers Co.
Kahlenberg Signals were developed to withstand the punishing use of commercial and military service. Their durability has been demonstrated over decades of service on ocean-going vessels ranging from naval warships to commercial vessels. Military specifications have



required extensive testing for many of these whistles and the accessories supplied with them, which have proven the exceptional qualities of Kahlenberg design and manufacturing. **Circle No. 144**

International Marine Software Associates
International Marine Software Associates (IMSA) is a cooperative association of software developers with complementary marine design products. This includes: FlagShip, which is from Proteus Engineering, NavCad — a HydroComp, Inc. product, General HydroStatics — from Creative Systems, Inc., and ShipCAM/CAD-Link/NC-Pyros - a product from Albacore Research Ltd. **Circle No. 145**



MariTEL Marine Communications System
In the United States, MariTEL is setting a standard for wireless telecom services. For the first time, all marine vessels — commercial and recreational — will enjoy complete US coastal coverage. MariTEL's digital voice and data transmission provides the total answer to complex marine communication requirements. By the year 2000, MariTEL will link your marine VHF radio to the telephone network with voice, e-mail, high-speed fax and data transfer systems. Get connected quickly, easily, privately and inexpensively. **Circle No. 146**



W&O Supply
Engineers and purchasing agents for shipyards, ship owners, cruise lines, and the military have relied on W&O Supply for over 30 years to meet their needs and their budgets for high-value, leading-edge piping, valves, fittings, flanges, tubing, metrics, and metals. Whether you need commodity or engineered products, W&O products save money by reducing weight, installation & production time, and maintenance costs. W&O Supply's product portfolio includes ANSI spec, DIN or JIS metric, and U.S. MIL-SPEC. **Circle No. 147**



Raytheon - Integrated Bridge System BridgeControl
The modern, flexible design can be used for all ship's bridges and all conceivable ship's operating requirements. The user-friendly technology designed for One Man

Bridge operation reduces workload and stress. The Raytheon Anschutz bridge concept achieves the goal of improving safety, efficiency and operational economy through functional integration of Radar, ECDIS and Track Controller. Our worldwide service net guarantees optimal after sales support. **Circle No. 148**



Tampa Bay Shipbuilding & Repair Company
Tampa Bay Shipbuilding & Repair Company is a full-service new construction, conversion, and repair organization with facilities in Tampa, Florida. Tampa Bay Shipbuilding & Repair Company is conveniently located in the protected harbors of Tampa Bay directly accessible from the Gulf of Mexico via a 43ft. (13.11m) channel, and is the largest, most complete shipyard between Pascagoula, Mississippi, and Hampton, Roads, Virginia. **Circle No. 149**



Schottel, Inc.
The Schottel Pump-Jet is the proven propulsion system for extremely shallow water operation. The Pump-Jet has the following advantages: the thrust is steerable through 360 degree, the complete unit mounts flush with the vessel's hull, there's no special hull design requirements, and it's based on the principle of a centrifugal pump. **Circle No. 150**



CMP Corporation
CMP Corporation is the world's largest independent manufacturer of replacement part for compressors used in air conditioning, cooling, and refrigerated transport systems. CMP's comprehensive line includes: pistons, rods, valve plate assemblies, bearings, crankshafts, liners, oil pumps, piston rings, seal assemblies, springs, valves, and gaskets for all major brands of compressors, including Carrier, Trane, Carrier Transicold, Copeland, Bitzer, Thermo King, and many others. **Circle No. 151**



Orkot Marine Bearings
A unique synthetic composition and the incorporation of solid lubricants, ensures Orkot Marine Bearings oper-



Products & Services Guide

ate with an exceptional low coefficient of friction in seawater, grease, oil and even in dry-running conditions. High load tolerance - for applications including mast bearings and cylinder rod-end bearings. Water lubricated - for rudder and propeller shaft bears. Low friction - suited to hatch cover pads and stabilizer bearings. **Circle No. 152**

Victaulic

No one makes installing ship-board piping easier than Victaulic. There's no welding so assembly is quicker and fire hazards are eliminated. It's lightweight for easy handling. And on-site fabrication saves you time and money. All of which adds up to reduced installation costs and big savings over traditional piping methods. The Victaulic system. **Circle No. 153**



Azonix

Azonix is dedicated to the design, manufacture and support of high-precision measurement and control systems. This standard, along with a reputation for exceptional ruggedness and reliability, has led to their acceptance by world leaders in extractive and process industries, discrete manufacturing, and research and development. **Circle No. 154**



Drew Marine

When you need marine products to maintain your ship, you can call just one source. That source is the Drew Marine Division of Ashland Chemical Company. We provide a comprehensive offering of marine chemicals and testing equipment, sealing and welding products, refrigerants and refrigeration services. For more than 75 years, Drew Marine has led the industry with innovative



technical assistance and services, a commitment to quality, research and development, and environmental responsibility. **Circle No. 155**

Algae-X International

Algae-X is the next generation in magnetic fluid conditioning technology. Algae-X products clean your total fuel system by simply running your engine or re-circulating pump & slimy. Magnetic fluid conditioning prevents paraffin & scaling. **Circle No. 156**



Atlantic Marine

The Atlantic group of shipyards is known throughout the world for quality shipbuilding, conversion and repair. Conveniently located on the East Coast and Gulf Coast, our reputation for quality workmanship, on-time delivery and competitive pricing is unsurpassed. **Circle No. 157**



John J. McMullen Associates, Inc.

John J. McMullen Associates is the premier naval architecture and marine engineering firm in the world. Since 1957 - commercial and military ship new construction and conversion design, detail design, international construction program support, marine consulting, and pollution prevention programs. **Circle No. 158**



NACE International

NACE offers education programs, intensive week-long courses are developed and taught by corro-

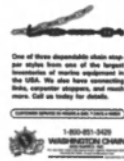


sion professionals with years of practical experience in the field. General education courses include: Basic Corrosion, Corrosion in Oil and Gas Production, Cathodic Protection: An Introduction, Protective Coatings and Linings, Cathodic Protection: Theory and Data Interpretation Designing for Corrosion Control Cathodic Protection: Design I. **Circle No. 159**

Washington Chain & Supply

Washington Chain & Supply, Inc. (WCS) has been serving the marine, industrial and off-shore industries for more than 30 years. WCS has one of the largest inventories of new and used anchors, anchor chains and fittings in the United States. WCS carries both foreign and domestic anchors, chains and fittings, as well as new, used and surplus. **Circle No. 160**

THE DEVIL'S CLAW



Vancouver Shipyards

Vancouver Shipyards began operation in 1902. Located on the north shore of the Port of Vancouver, British Columbia, Vancouver Shipyards provides construction and repair services to ships along the Pacific coast, offering a range and quality of service that cannot be matched by any other shipyard in the region. **Circle No. 161**



Manly Marine Closures Ltd.

Since the 1960s, Manly Marine Closures Ltd., have set the standard for quality. Unique patented designs provide a full range of quick-acting escape hatches. When you choose Manly you are investing in the best closure that money can buy. **Circle No. 162**



Blount Industries, Inc.

Blount Industries provides the following: *Our Shipyard can custom build a vessel to your specifications. *Full engineering capabilities. *Skilled-dedicated craftsmanship. *40 years knowledge & experience designing and building to USCG, ABS, SOLAS 2010, US Public Health - with full certificates ready for service. *Plus, competitive pricing. **Circle No. 163**



Marco Shipyard Seattle

Marco Shipyard Seattle is a world-class shipbuilder. Marco recently built a world-class tug - the tractor tug DELTA LINDA, now in service in San Francisco: 4,4000 HP with twin Z-drives: 105' x 34' x 16.5' (32 x 10.4 x 5m). **Circle No. 164**



M. Rosenblatt & Son Inc.

M. Rosenblatt & Son is one of the nation's leading privately owned naval architecture and marine engineering firms with ten offices and over 600 engineering, design, and logistic personnel nationwide. The company also specializes in naval ship design and life cycle support. **Circle No. 165**



Autronica USA

Autronica is a supply/design and retrofits/repair company. It provides the following: *Temperature Sensors. *Engine Control and Monitoring. *Engine Condition Monitoring. *Radar Tank Level Indication & Alarm. *Fire Detection & Alarm. **Circle No. 166**



United States Merchant Marine Academy

The United States Merchant Marine Academy (USMMA) at Kings Point, New York is one of the five federal service academies and the America's premier maritime institution. Along with the undergraduate program, USMMA offers the most extensive maritime and transportation continuing education program in the United States. Most courses are one to two weeks in duration. **Circle No. 167**



Tranter, Inc. - Plate & Frame Heat Exchangers

The design flexibility of Tranter, Inc.'s superchanger plate and frame heat exchangers makes them ideally suited to a wide variety of ship-board cooling and heating applications. Typical requirements involving central cooling systems, or those handled directly with seawater include: engine jacket water coolers; engine piston water coolers; engine lube oil coolers; reduction gear lube oil coolers; fresh water coolers; auxiliary fresh water coolers; generator engine coolers; bow and stern thruster engine coolers; and reefer condenser coolers. **Circle No. 168**



Pelican Rope Works

Considered the Best Value on the market, Pelican Rope manufactures braided ropes with a hard-to-beat quality price and customer service. Double-Braid/12-Strand/8-Plait, sizes from 3/16" to 1-1/2" diameter, Nylon/Polyester/Spectra/Kevlar. Colors and urethane coatings available. Thanks for calling 800-464-ROPE. **Circle No. 169**



Marine Products Catalog in 2000...

Maritime Reporter & Engineering News and sister publication **MarineNews** are teaming in 2000 to offer maritime companies an unparalleled means to deliver your message in front of your buyers - our readers - throughout the year. In all, 16 editions (6 in *Maritime Reporter*; 10 in **MarineNews**) will offer this products and services text and picture guide, which has proven again and again to be a prolific generator of sales leads. For information on maximizing your company's exposure, contact your sales representative. Or call 212-477-6700; fax: 212-254-6271; e-mail: mren@marinelink.com

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Staffed by ABB factory-trained technicians, our repair facilities offer swift handling of your maintenance concerns by people you know you can trust. With the help of our computer network, ABB technicians can access your

turbocharger's complete history to aid in speedy diagnosis. They can then utilize our locally maintained stocks of genuine ABB parts or go on-line to rapidly locate necessary parts in our worldwide inventory.

You asked for the best in service, and we delivered. But you would expect nothing less. After all, we design and build the industry's most efficient turbochargers. It's only natural that we also offer the finest in repair and maintenance service, worldwide.

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Circle 200 on Reader Service Card

Europort '99 Set To Sail

Europort '99 once again promises to attract a wide spectrum of marine equipment and service suppliers to exhibit their wares to thousands of potential ship-owning and operating buyers. In addition to the exhibition, which has become a staple in the industry's voracious trade show diet, this year's exhibition is complimented by a particularly strong conference component, featuring prominent industry speakers from all facets of the maritime world, along with presentations by leading brokers and key industrial players regarding the current market prospectus. This year's Europort Conference focuses on ways in which the European market will advance. Held at Amsterdam RAI from November 16-20, the exhibition is slated as the platform for the international maritime industry to present itself to a worldwide trade public. More than 1,100 maritime display stands from the Netherlands and around the world are expected to attend. The exhibition will also house national pavilions from Austria, China, Denmark, Italy, U.K and the U.S. On display will be thousands of

marine products representing all aspects of the International Maritime Industries such as ship design, building operation, maintenance and repair; dredgers and dredging equipment; and ports, harbors and locks.

Panel speeches, which commence on Tuesday, November 16, feature industry leaders such as **Willem de Jong**, managing director, marine division Lloyd's Register; **Jeremy Langdon**, managing director, Hanno Shipping; and **Andrew A. Wright**, senior engineering specialist, American Bureau of Shipping. Topics of discussion will focus on today's main issues, specifically What should European shipbuilding fairly expect from the politicians?, The Norwegian maritime cluster — a continually evolving form, and The future for diesel engine building in Europe.

If you are interested in sponsoring or exhibiting at Europort '99 please contact **Cathy Hodge** at +44 (0) 20 7453 5414; or fax +44 (0) 20 7631 3214. Those wishing to attend the conference should direct enquiries to **Jennifer Mountford** at +44 (0) 20 7453 5492.

STN Atlas To Exhibit

Hamburg-based STN Atlas Marine Electronics at Europort 99 will feature a comprehensive range of automation, communication, navigation, propulsion and hydrographic survey systems. Among the wares displayed will be a new series of high-resolution radars featuring advanced clutter suppression and innovative docking maneuver facilities, the Atlas 1000 series.

Additional key exhibits include a state-of-the-art integrated bridge control assembly implementing the NACOS navigation command sys-

tem, which is type-approved for automated navigation and track-keeping — in addition to a DNV Watch-1 notation. Featured communications on display will be the latest Debeg range of GMDSS units while propulsion exhibits will include Dolphin, and advanced podded system developed in conjunction with Netherlands-based LIPS BV and LDW of Bremen.

Circle 64 on Reader Service Card

GL To Display At Europort

Germanischer Lloyd (GL) will be highlighting its extended services for

shipowners and operators at the upcoming Europort '99. Offering new IT tools for shipowners, which support the design process and ship operation, shipowners and operators can reap favorable benefits from the GL service package for the topics ISM/ISO. Besides safety, ISM certification with GL aids in achieving improved procedures and cost-reduction. Another member of this software family has been released - the Poseidon New Design. Available soon, this dimensioning and testing program was developed by designers for designers and includes a user-friendly interface.

Circle 46 on Reader Service Card

Pattje Shipyards Constructs Variety Of Vessels

With more than 200 years of shipbuilding experience, Pattje Shipyards of Waterhuizen has built an array of vessels, such as gas tankers, suppliers and multi-purpose container vessels. A member of the Bodewes Volharding Group, which consists of Shipyard Bodewes Volharding at Foxhol, Pattje Assemblage yard at the seaport Eemshaven and the Noord Nederlandse Staalbouw at Groningen, Pattje holds a prime spot in the world of international shipbuilding.

Circle 67 on Reader Service Card

VAF Introduces Premier Viscosity Sensor

VAF Instruments has introduced ViscoSense, a new sensor used for viscosity measurement of fuel oil for a ship engines or oil fired land based power plants. The sensor presents a technology, which until now, had reportedly never been used in this market.

Proven tests have shown that ViscoSense's measuring principle, which is based on rotational vibration technique, ensures accurate and trouble-free measurements. The compact, maintenance-free sensor is easy to install in existing systems and requires no spare parts.



Circle 66 on Reader Service Card

Port of Rotterdam

News notes from the world's busiest port

ECT Deal Approved

The Rotterdam City Council has approved the buying of 35 percent of the shares of ECT by Rotterdam Municipal Port Management as a member of a consortium in which Hutchison (35 percent), ABN AMRO Bank (14 percent), ING Bank (14 percent) also will participate. The banks rank one and two in the Netherlands and their substantial involvement is considered as an expression of faith in the consortium and ECT. Two percent of the shares are reserved for employee benefit

RMPM Prepares For Y2K Glitches

The Rotterdam Municipal Port Management sent out Y2K-preparedness questionnaires to more than 1,300 vessels, and was positively surprised with the responses that it generated. RMPM expects 150 sea going vessels to be in the port area during the critical period between 10 a.m on December 31 and 2 p.m. on January 1. Concerning the millennium bug Pieter Struijs, executive director Shipping of the RMPM, divides the problem in four different items. 'The critical systems - for example the Vessel Traffic Management System - the nautical services and the crisis organization at the port are millennium-ready.' The fourth item concerns the admittance policy. Only millennium-ready ships are welcome in Rotterdam. By answering the questionnaire which was distributed at the beginning of the summer, the shipowner declares that he will respect the millennium code of good practice and states that their ships are millennium ready.

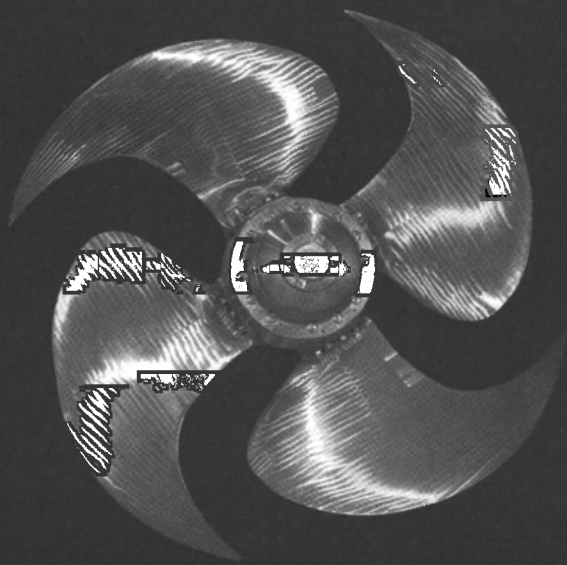
New Inland Terminal Is Operational

On October 11 another new inland barge terminal came into operation in the township of Gorinchem, just 40 km from the eastern port area of Rotterdam. The Merwede Terminal Gorinchem is operated by the Kool Road Haulage Company. Kool expects to handle some 10-15,000 teu's per year. A large customer is Nestlé, with one of its factories adjacent to the terminal. About 10 years ago inland container shipping started an impressive advance. Nowadays some 1.5 million teu's are transported from and to Rotterdam by barge. Besides ever growing numbers a second trend is the diminishing distance between the satellite terminals and the marine terminals in Rotterdam.

New Services To Spain, Norway & Sweden

On September 20 Cantabrian Line, a joint venture of the Rotterdam agency Voigt & Co and the Spanish company Perez Y Cia, started a new weekly container service with Santander. Capacity is 172 teu. Santander especially serves the region Castilla-Leon and Madrid. In September Euro Container Line, a joint venture of Eimskip from Iceland and Wilson Eurocarriers from Sweden, started a new weekly container service between Rotterdam and four ports on the west coast of Norway. Starting October 1, Unifeeder raises the frequency of its Rotterdam-Göteborg (Sweden) service from two to three times a week. The three vessels of the service have a capacity between 375 and 500 teu.

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intelligent solutions by wärtsilä

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Regardless of vessel type and power, you can expect nothing less than state-of-the-art performance, efficiency, low noise, low vibrations and reliability from Wartsilä Propellers. And of course, Wartsilä Propellers are included in the global Wärtsilä service network.

WARTSILÄ PROPPELLERS

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CORPORATION

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MarineOne
Corporation

NAUTRONIX



MarineOne is proud to announce it's association with **NAUTRONIX**. We have entered this partnership to offer the best possible combination of sales, service and installations of Dynamic Positioning Systems (DPS) and related equipment. We feel the **MarineOne NAUTRONIX** association is a positive one for the drilling, offshore and oilfield support vessels in the United States and International markets.

The **MarineOne NAUTRONIX** association will provide our customers the opportunities for truly custom, marine application designs. This union will also provide two full design staffs as well as providing comprehensive technical support. Using **NAUTRONIX** DPS equipment, the **MarineOne NAUTRONIX** design engineers work closely together to ensure the best solution for custom steering and navigational needs.



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COSCO Makes 500-Ship Fleet A Role Model

by David Tinsley, technical editor

Although it has a tradition of "keeping a low profile", China Ocean Shipping (Group) Company (COSCO) has provided something of a beacon for the industry in nurturing a seminal, safety-related development.

Its bold decision to fit a multi-function navigation support and tracking system, the product of Sino-British technical collaboration, aboard every unit of its near 500-strong fleet, undoubtedly advances the cause of digital chart-based electronic navigation. The resultant Global Navigation Intelligence System (GNIS) combines a raster chart display with meteorological, tidal, current

and port data, plus route planning and fleet tracking, as well as search and rescue capabilities within a software and hardware regime which caters for the evolution of the various technologies. It therefore promises immediate safety and operational benefits, while serving the longer-term requirements of the shipowner.

Just as attention to quality in a shipbuilding environment can be favorable to productivity, a safety-driven approach in shipping can yield improved, long-run efficiency. COSCO thereby expects to achieve savings in its considerable bunkering bill, through greater navigational precision. For example, the calculation of a Great Circle route, and the computation and correction of



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Advances on the bridge continue to drive ship and boat operations to higher levels of safety and efficiency.

track errors, is fully automatic under GNIS.

COSCO's pragmatism, in part a reflection of the seagoing background of most of its senior management, is complemented by the long-term vision expressed in its investment in GNIS. While first-hand bridge experience exists in depth among its decision-makers, with an attendant respect for the role of accumulated experience and knowledge in the science of navigation, the company is keenly aware of the impact and potential of "universal information" in application to shipboard systems.

GNIS is an embodiment of fundamental change in the tools of navigation and in the control of fleets. It allows all navigation functions to be effected in one place in a unified manner, giving instantaneous and accurate ship's position, course and track information, and should contribute to the watchkeeper's peace of mind and eliminate several potential sources of human error. Furthermore, the automated transmission of data back to the company's shoreside organization will strengthen COSCO's cargo tracing and tracking system, giving customers greater certainty regarding the status of goods in transit.

The outfit, which went aboard the 3,500-TEU containership Da He at the U.K. North Sea port of Felixstowe in September, marked the start of a five-year program to equip every existing vessel with GNIS. The equipment has also been incorporated into the technical specification for the entire COSCO newbuild program, currently running to more than 30 ships, including the recently booked further series of 5,250-TEU, wider-than-Panamax linehaul vessels from Kawasaki Heavy Industries. The immediate emphasis on retrofits promises early benefits from the system. The commonality of such equipment throughout the fleet, one of the world's largest, means that a COSCO deck officer will encounter the same type of navigation system on any ship. The shipping industry has not been noted for such standardization, which promotes rapid user familiarity and hence safety and efficiency, and COSCO can be commended in helping to steer matters in the right direction.

Key inputs to GNIS are the Admiralty

Raster Chart Service (ARCS), the digital electronic charts provided in weekly-updated CD form by the UK Hydrographic Office (UKHO), and worldwide weather data sourced from the Chinese Meteorological Administration's subsidiary Global Weather Routing Technology Company. The Suffolk-based company SCD, an Admiralty chart agent

and ship delivery firm, is supplying the Navigator GNIS package, which has been developed in close co-operation with COSCO itself using a specialist British software firm, Electronic Navigation Systems (ENS).

While raster-based charts are at the heart of the system now being supplied, GNIS is fully compatible with vector

system charts, as an important, future-oriented feature. Since worldwide coverage of ENC (vector) charts based on official data is still some way off, raster and so-called dual-fuel arrangements (using vector sets where available for localized areas) offer clear practical advantages for mariners and shipowners.

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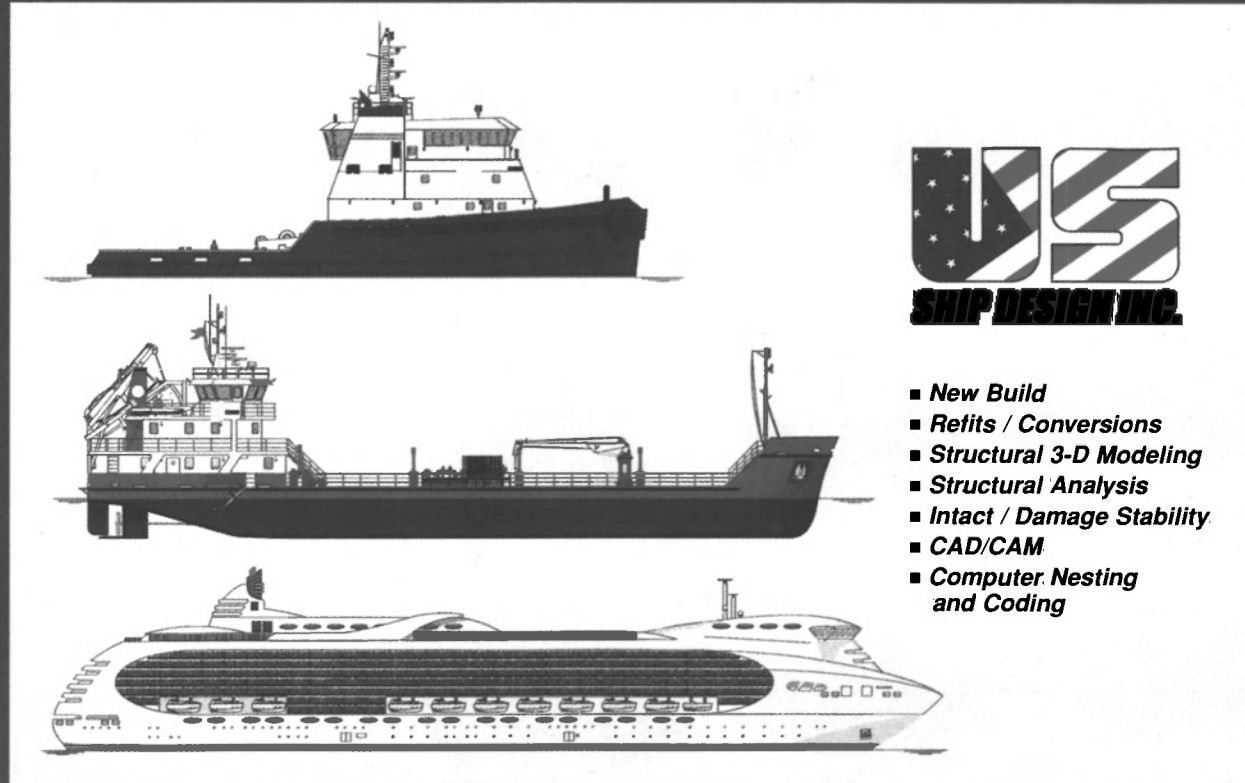
The Great Debate

Despite tremendous strides being made on the marine electronics and technology fronts, ships continue to collide at

what many deem an unacceptable rate. The recent rash of high-profile casualties, particularly the ones involving fully

loaded cruise ships, has caught the eyes of national and international legislators and is sure to result in action.

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Despite the best efforts of electronic makers and quality ship owners who outfit their vessels with the latest products and systems to ensure safety of passengers, crew, cargo and ship, vessels are running into one another at an alarming rate. One of the more visible examples of this (although the official cause of the mishap is yet to be stated) was when a Norwegian Cruise Line cruise ship Norwegian Dream and the containership Ever Decent collided in the English Channel. Although the ships hit in the middle of the night, it was reported that winds were light and visibility was good.

Vessels today, although they are years behind technologies adopted by other modes of transportation, are better able to "see" and communicate with one another - no matter the weather condition.

While "the human factor" and insufficient training can and have been pointed to in many instances, the responsibility falls onto the vessel owners and operators to ensure that their ships are continually updated, and that the crews are trained, with the best products and systems available.

Providing the Nudge

Owners who regularly maintain and update vessel and equipment, and crew vessels with well-trained seamen are generally dubbed "good" or "quality" owners. But it is good money to bet that most owners begrudgingly spend extra dollars on ancillary equipment and systems, particularly in today's low freight rate environment.

Enter legislators and rule-making bodies.

The maritime industry has traditionally been one that reacts to major disasters with new rules and regulations, rather than one that is proactive in assessing potential dangers and reacting new mandates. "We cannot let events unfold and then respond to ensuing disasters. We have to prevent them from happening in the first place. New technology will help in this process," said The International Maritime Organization Secretary General **William O'Neil** in a speech commemorating World Maritime Day. He also said that ships will undoubtedly become more complex. "They will be fitted with more powerful computers and the links to shore by satellite communication systems will become increasingly sophisticated. Their navigation will become more dependent on electronic innovations such as the global positioning system, which will be combined with electronic charts and automatic alerting mechanisms."

At another conference in mid-October



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Electronics Update

ber, Mr. O'Neil seemingly ruffled some industry feathers with the proposal of a system of mandatory traffic control compliance by ship masters with orders from shore traffic controllers. The suggestion understandably launched a colorful debate at a conference on naviga-

tional safety in the Straits of Malacca and Singapore.

"Under existing regulations, the VTIS (Vessel Traffic Information Systems) has the right to contact the ship concerned and warn of the danger ahead. But the shore authorities have no author-

ity to compel a change of course," Mr. O'Neil reportedly said. "We should ask ourselves if the time has not come to question this approach and to empower the shore authorities, in certain cases, to order ships to take whatever action is necessary to avoid an accident."

In discussing the program, he compared the proposed system to that of the relationship between airline pilot and air traffic controller. "There is no doubt that positive traffic control is essential in civil aviation. The principle of control has been accepted in all other modes of transport and there is no reason for not extending it to shipping, when safety would be enhanced."

While the suggestion is obviously a far way from serious debate, let alone implementation, the weight of having Mr. O'Neil broach the topic at a major industry event is not lost. The comments prompted a debate on liability if the captain followed orders from shore. Participants also discussed requiring ships to be fitted with a transponder, or electronic automatic identification system with satellite communication ability that transmits the ship's name, position, speed and course.

Interestingly, it was at an international meeting just two weeks prior that shipowners maintained they were systematically being choked by legislation. Shipowners said the maritime industry is being choked by legislation and that they are unfairly targeted as the culprits for all ills in the sector. Comments came from a group of shipowners who were addressing approximately 1,000 delegates from 35 countries who attended the bi-annual Maritime Cyprus Conference in the port town of Limassol.

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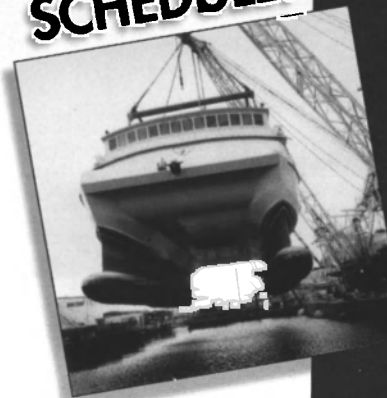
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a ship's propulsion system that are not identified by standard alarm systems. The Ready Reserve Force (RRF) was established in 1976 and provides prompt sealift support for rapid deployment of U.S. military Forces for peacekeeping or humanitarian missions.

Early in the Bosnian conflict, the U.S. was called upon to supply sealift capability to move NATO vehicles, ammunition and support equipment to Croatia. Two MarAd RRF ships were called upon to carry NATO's cargo in support of Britain's 24th Air Mobile Brigade. The Cape Race and the Cape Diamond carried more than 92 percent of the total cargo transferred from the U.K. to Croatia. Included were 2,015 military vehicles, 232 containers and 3,629 pallets of breakbulk cargo.

In December 1998, the Cape Race was called up again, along with the Cape Rise, to return to Bosnia. MarAd maintains these ships in reduced operating status, with 10-person crews, ready for sailing within four days notice. The Cape Race and Cape Rise were fully crewed and underway within 48 hours. These ships, along with the Cape Ray, are operated for MarAd by Intrepid Ship Management, Inc., and are homeported at Moon Engineering Co., Portsmouth, Va.

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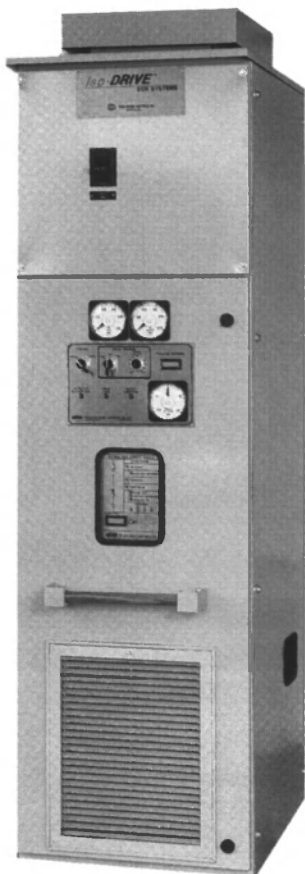
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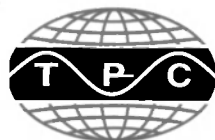


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and four elevators to move cargo between decks. The vessels are 648 ft. (197.5 m) long and 105 ft. (32 m) wide. Operating draft (depending on cargo load) is 25 - 28 ft. (7.6 - 8.5 m) With a service speed of 18 knots, the vessels have an operating range of 21,000 nm.

The propulsion plant consists of twin Kawasaki-MAN 14V 52/55 (14,000 hp @ 430 rpm) four-stroke medium speed diesel engines fitted with exhaust gas turbochargers and integral air coolers. The main engine couplings are Vulkan EZ-360-S flexible couplings. Both engines connect to one Kawasaki Heavy Industries double helical, single reduction gearbox. The main engines also have PTO shafts that drive, via another Vulkan coupling, the main generators.

The Cape Race, Cape Rise and the Cape Ray are maintaining their high state of readiness with continual maintenance and periodic system upgrades. In early summer of 1999, the ships upgraded their Vulkan monitoring devices by installing new circuit boards and leads to the Vulkan EZ-S couplings.

The Vulkan Coupling Deflection Monitor is a two-channel monitoring system that measures the twist of the couplings. Magnetic pickups, on the drive and driven sides of the coupling, measure the degree of deflection and trigger an alarm when the preset angle of twist is exceeded.

The more sophisticated Vulkan Monitoring and Diagnostic System (MDS) can monitor up to four measurement points on a single row or multi-row cou-

pling. Individual signals or the differential signal between two input channels can be monitored. Signal processing takes place continuously in the background, while on the display, a limiting parameter can be set or adjustments can be made. If pre-set limits are exceeded, an audio or visual alarm will be trig-

gered. The notice of alarm is registered and the condition that led to the alarm is recorded by means of a "time-window," which stores the conditions present in the system for a stipulated period prior to the alarm being triggered.

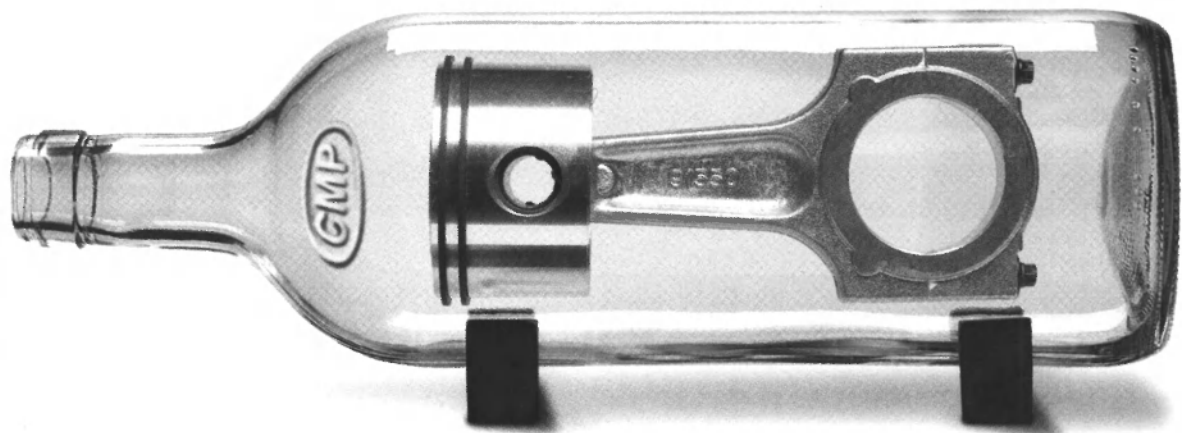
When monitoring the total speed range, including "Start/Stop," four dif-

ferent alarm conditions can be set. This eliminates false alarms generated by passing through a particular resonance.

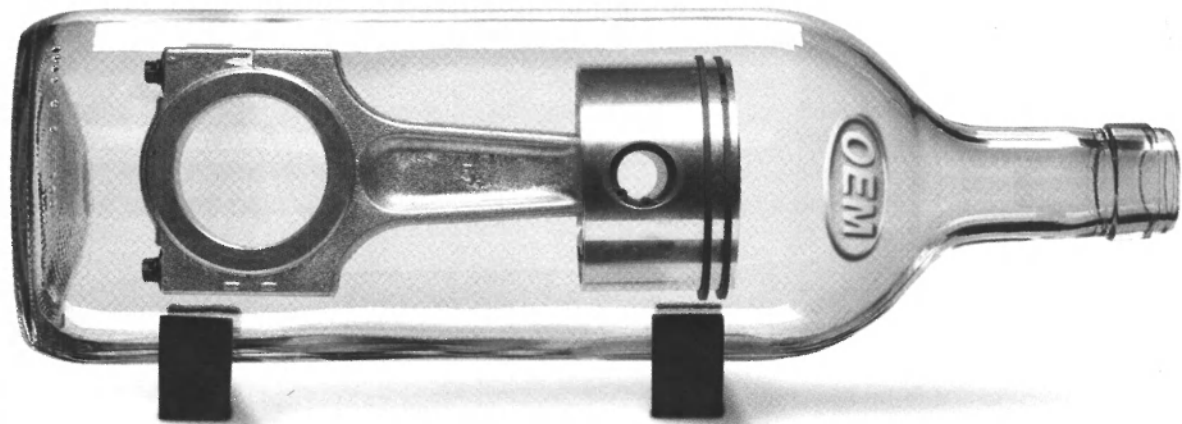
The monitoring of a measured variable takes place after analysis of the signal. Following variables can be monitored:

- the mean twist angle

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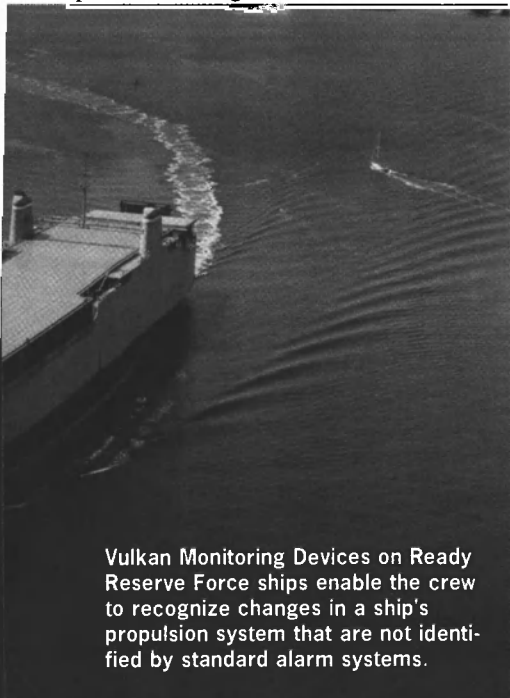
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Vulkan Monitoring Devices on Ready Reserve Force ships enable the crew to recognize changes in a ship's propulsion system that are not identified by standard alarm systems.

Electronics Update • Monitoring

- the dynamic twist angle with amplitude of the total sum
- vibration and amplitude of each single order
- transient conditions such as shock load or start/stop maneuvers

Installing monitoring devices on a ves-

sel's couplings is a proactive approach to vessel safety and maintenance ensuring problem free operation. Using the data from the monitoring devices, effective inspection and maintenance programs can be implemented.

Any of Vulkan's monitoring systems can be used strictly as a warning or can

be tied into the vessel or equipment's master control systems. Depending on the preset parameters and capabilities of the monitoring and control systems, functions such as clutch engagement, engine speed or shaft brakes could be automatically adjusted or applied.

Circle 26 on Reader Service Card

Transas Earns ECDIS Type Approval

Transas Marine has become the first company in the world to receive type approval for its NAVI-SAILOR 2400 ECDIS (Electronic Chart Display and Information System). The news is considered significant achievement for the company, which has been at the forefront of ECDIS development since the IMO Resolution in 1995 that allowed ECDIS to be used as conventional ships bridge equipment.

Type approval has been given by what many consider to be the most prestigious national authority, the BSH (Bundesamt fuer Seeschifffahrt und Hydrographie) in Germany. Transas has been working closely with the BSH to ensure that all requirements have been scrupulously checked for compliance with all international standards during the type approval procedure.

The Transas Navi-Sailor 2400 ECDIS has already achieved type approval by the Russian Department of Maritime Transport and Russian Maritime Register of Shipping.

Marine electronic advances such as ECDIS are expected to vastly improve the safety of navigation, reduce the accident rate, and improve the overall efficiency of ships operations.

The Navi-Sailor system is designed to perform considerably more functions than those of simply meeting the standard IMO ECDIS specifications. It also provides the navigator with information such as a unique global database of tidal currents, levels, seasonal surface currents, climatic conditions and the resulting prevailing winds and wave heights. These factors allow the navigator to make calculations of ETA far more accurately than previously achievable.

The system can also incorporate a Radar Integrator Board (RIB), which allows the radar image to overlay the chart. This enables the operator to assess the accuracy of the GPS or DGPS operation, correctness of the electronic chart referencing and the gyro compass operation.

A comprehensive set of alarms has been incorporated which provide signals for a wide range of actions and failures including off-course, approaching danger, guard zone, CPA and TCPA violation, depth and positioning.

The ship owner is provided the unique capability of Voyage Data Recording, a standard feature of the Transas NS2400 ECDIS. All ships data, sensor information, alarms and radar image overlay is recorded and can be easily recalled and replayed with the Playback function.

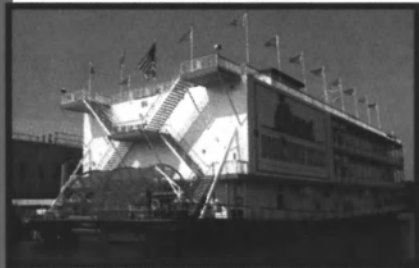
To ensure that owners benefit from type approved ECDIS as soon as possible, Transas will launch a comprehensive lease - purchase package at this year's Europort Show in Amsterdam.

Circle 55 on Reader Service Card



AVONDALE IN THE BEGINNING

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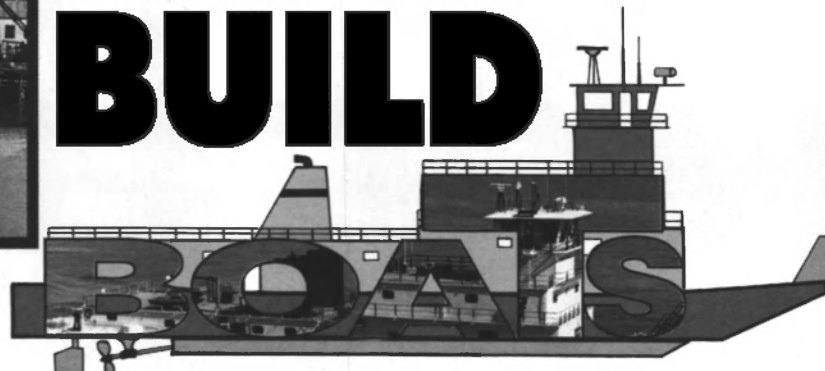
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Sailor Establishes U.S. Office

The renowned Danish manufacturer of Sailor maritime communications equipment — S.P. Radio A/S — has established a sales office in the U.S. under the name Sailor



USA. for more than 50 years, S.P. Radio A/S has manufactured and distributed marine safety equipment in 90 countries. A new product for the company is Sailor Iridium. The Sailor Iridium Single Channel SC4000 is the first system that will offer 100 percent global coverage, including the polar regions. The Sailor Iridium Single Channel SC4000 consists of a separate outdoor antenna, a transceiver unit with an easy accessible SIM-card reader, and a remote control handset and/or control unit.

Circle 33 on Reader Service Card

Litton Marine System Offers Special Naval Features

Litton Marine Systems recently introduced a new series of navigation radars especially designed for modern naval vessels. The new version of its popular Decca BridgeMaster E radars with a package of special features for military applications was unveiled at the Defence systems and Equipment International (DSEi) exhibition. The system provides a "red first strike" function, which automatically highlights fast-moving targets. Other new features include automatic target intercept vectors, helicopter approach vectors, station keeping and a "freeze frame" function that allows the radar operator to hold the radar picture under emissions control (EMCON).

Circle 41 on Reader Service Card

Leica Supplies GPS For P&O Nedlloyd

Leica Geosystems completed delivery of 46 marine GPS receivers for P&O Nedlloyd BV, Rotterdam, to be installed as primary navigation instruments on board their fleet of container vessels.

Possible under a private labeling agreement with Leica, the order, which was made by Litton Marine, included 31 LMX400 GPS and 15 LMX406 DGPS receivers with selectable alarm output option as required by major classification societies for Watch One bridges.

Circle 45 on Reader Service Card

Raytheon Installs 43rd IBS

Since introducing its new Integrated Bridge System Bridge Control, Raytheon Marine has installed the new system onboard 43 vessels. Included in these installations were One Man Bridge systems (according to class nota-

tion DNV-W1) for two paper carrier newbuildings for Norwegian shipowner Lys Line and two product tankers for Norwegian shipowner Anders Utkilen. Raytheon was also granted new orders for 63 Integrated Bridge Systems for newbuildings in Europe, the U.S., Korea and China. Bridge Control is a complete

navigation and communication system, which includes Raytheon Pathfinder/ST MK 2 ARPA radars with built-in autopilot remote control panels, Pathfinder ST MK 2 ECDIS with separate planning station and Conning display and alarm transfer system.

Circle 68 on Reader Service Card

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Circle 318 on Reader Service Card

Morgan Joins SEA As Marketing Director

H.W. "Buddy" Morgan, Jr., has been appointed marketing director for SEA and Datamarine International, Inc. With more than 19 years experience in various positions, Morgan spent several years with Raytheon Marine, Trimble and Simrad.

DEIF Meets Tough New Standards

The implementation of the new "Marine Equipment Directive (96/98/EC) on January 1, 1999 throughout the European Union meant the use of advanced marine electronic equipment (as well as four other classes of equipment) was now mandatory, not optional, on ships flagged in EU member countries. Danish company DEIF A/S ensured its future market position when the first three types of its range of illuminated instruments "for navigation purposes" received approval under the new directive. While the process of approval was a long one, it was not particularly difficult, according to Niels Martin Jorgensen from DEIF's product approval department, as the instruments had already been approved by major classification societies, and most mandates of the new directive were thus already met or exceeded.

Circle 32 on Reader Service Card

and calm seas. The fishing boat went down with all hands. Silvery Sea inexplicably did not take evasive action. However, the investigation also found that the Merkur had not used the radar, which could have reduced the possibility of a crash. In addition, the bridge apparently was not properly manned at the time of the collision.

UKHO Extends Chart Coverage

The United Kingdom Hydrographic Office (UKHO) is extending its coverage of navigational charts into Norwegian national waters in cooperation with the Norwegian Hydrographic Service (NHS). The new chart series will encompass Admiralty paper and ARCS charts, be fully corrected up to the date of issue, and supported by existing Admiralty services.

Circle 34 on Reader Service Card

MTN Continues Relationship With HAL

Maritime Telecommunications Network, a subsidiary of ICG Satellite Services, will continue to provide telecommunications services for passengers, staff and crew to all Holland America vessels. The revised agreement, which plans to offer additional enhanced services, also includes shore-to-ship calling and Internet capabilities.

Circle 35 on Reader Service Card

OSI Reports Favorable Reviews

Offshore Systems International (OSI) reported that its ECDIS Product Line continues to garner exceptional reviews from new and current customers. OSI continues to receive orders from organizations such as the Canadian and U.S. Coast Guards and various Military organizations in North America. OSI has been collaborating with military and Coast Guard agencies globally to aid in the improvement of navigation safety internationally. High on the list of the company's priorities is its compliance for Y2K.

Circle 36 on Reader Service Card

Updated GMDSS Training Software Available

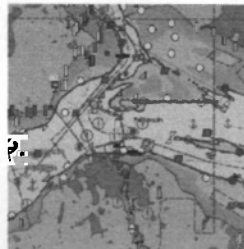
Maritime Education Sweden AB recently released an updated and improved version of the interactive GMDSS training software entitled Maritime Communications. The training software is recognized as an efficient, entertaining way to acquire and maintain GMDSS knowledge. It is used by deck officers as a preparation for GMDSS courses and as a refresher. The software, V 2.0, has been changed to take into account changes in IMO regulations since the last version. The software package sells for \$790.

Circle 40 on Reader Service Card

ChartWorld Delivers Demo

ENCs Via 'Net'

ENC Demo Data supplied by the UKHO are ready for downloading from www.chartworld.com. ChartWorld is claimed to be the only Internet distributor of the ENC Demo Data supplied by the UKHO. The following cells are available: Felixstowe and approaches; Southampton and approaches. The data is available only for demonstration and evaluation in conjunction with SeeMyENCI software.



Circle 38 on Reader Service Card

Dual Blame In Collision

The case of a collision in June 1998 between a Scottish trawler with a German freighter — resulting in the loss of five lives — clearly points out how advances in marine electronics are useless unless utilized correctly. Recently, this case was investigated by a German marine accident board, which found fault on both sides. The inquest said that the captain of the German freighter Merkur and the shipping company were guilty of incorrect behavior, as the Merkur did not follow the required safety rules. The Mallaig-registered trawler Silvery Sea was headed for Denmark when it collided with the 3,815-ton Merkur in clear weather

EC Gives OK To STN Atlas Marine Electronics Merger

The European Commission has given the go ahead for a merger between STN Atlas Marine Electronics GmbH, its majority stockholder the Rheinmetall Group, and the marine electronics unit of SAIT-Radio Holland S.A. Rheinmetall DeTec AG and SAIT-Radio Holland will each have a 50 percent stake in the new EMG EuroMarine Electronics GmbH. EMG EuroMarine Electronics will be headquartered in Hamburg and employ 2,500 worldwide. Sales in 1999 will top 400 million Euros. EMG EuroMarine Electronics GmbH's management board includes Dipl.-Ing. Heinz Baier, CEO; Jacques Debulpaep, COO; and Dipl.-Kfm. Peter Winch, CFO.

Circle 39 on Reader Service Card

Sad to see the Horizon HX220S go?

The most popular Horizon ever. Canned.

For many an offshore professional, the Horizon HX220S 5W handheld VHF was like a trusted friend. They'd go everywhere together. Sure, sometimes they got banged around a little and more than a few times they got wet. But when you just have to talk, well, the HX220S was always there, steady and reliable.

But it had to happen sometime. Horizon just doesn't make 5W handhelds like they used to. And while you won't be able to buy a new HX220S, console yourself with this thought: that Horizon HX350S over there on your right is a better radio with more features, it's still a Horizon, and it costs a bit less than your old pal.

So dry your tears and read on.

Nothing Takes To Water Like Horizon!



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Circle 364 on Reader Service Card

BP Marine Launches Port To Port

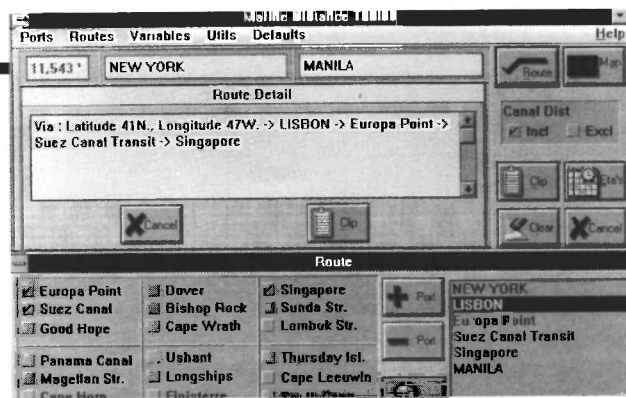
BP Marine is aiming to ease the task of marine route planning with its latest version of Port to Port, which is based on the company's own marine distance tables.

Used worldwide, Port to Port is reportedly the fastest, most accurate distance table ever - allowing for accurate and economical voyage planning. Activation by user is performed by entering departure and destination ports from more than 1,700 waypoints, canals or other ports that will be

included in the voyage. With one mouse click, the program compiles the shortest distance in an instant.

Allowing alternative routes to be evaluated, Port to Port also provides bunkering requirements to be calculated and ETA's to be accurately forecast. Operating under Microsoft Windows, Port to Port is available on a 3.5-in. floppy disk.

Circle 56 on Reader Service Card



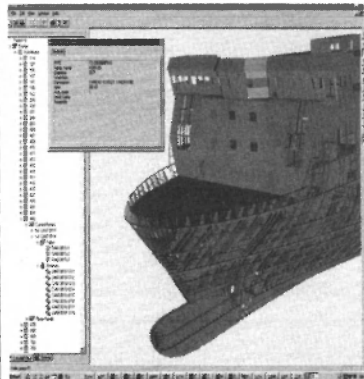
Creative Systems

Upgrades GHS Software

General HydroStatics (GHS) software produced by Creative Systems is now available with an added feature - the ability to handle multiple floating bodies with points of contact between them. With ground contact handled simultaneously, applications include detailed simulation of loading and unloading of floating objects by partially submerging the carrier; complex salvage procedure modeling; ice breaker simulation and dry docking.

Available through an optional software module labeled Multi-Body or MB, this capability is specifically integrated with GHS so that the regular features of the program can be used together.

Circle 57 on Reader Service Card



design development and management. Launched by Kockums Computer Systems (KCS) at Nor-Shipping this past June, Tribon M1 applications can be used together or with existing Tribon installations and databases on UNIX or VMS. The program encompasses four focused areas of applications: design, rule-based automated design, design management and production engineering.

Circle 58 on Reader Service Card

Spar Pens Dealer Agreement

Spar Associates of Annapolis, Md. signed a Dealer Agreement with AP&GF Marine Software to serve as representative and distributor of Spar's shipyard planning and production management software systems in Spain, Portugal and Latin America. With offices in Madrid and Seattle, Wa., AP&GF has agents throughout South America who serve the marine and naval markets.

Kockums Kicks Off Upgraded Tribon M1

The new generation of Tribon Shipbuilding system for ship design and building, Tribon M1 utilizes Microsoft NT-based technology to set the stage for easy installation, use and 3D

procedures for main propulsion and auxiliary machinery - but for management of fuel, ballast, cooling and other systems as well. The simulator is an authentic reproduction of engine performance and characteristics modeled after physical processes governing fluid mechanics, hydraulics and thermodynamics.

Autoload To Interface With Simrad

Autoship Systems Corp. of Vancouver, Canada, along with its partner Coastdesign, Norway have recently signed a contract with Kongsberg Simrad AS for the development of an interface between Autoship's Autoload program and Simrad's Vessel Control System (VCS).

Autoload is a DNV type-approved onboard stability and strength monitoring program, while VCS includes dynamic positioning and joystick-control systems, position mooring, thruster control and vessel automation systems.

The premiere application of the VCS/Autoload combination will be installed on a drilling rig owned by Sedco Forex Offshore — the offshore contract drilling business owned by Schlumberger. The combined product, which enables the user to experience the monitoring and control capabilities of VCS — along with the analytical capabilities of Autoload, features an auto trim capability. This function allows both systems to automatically adjust the ballast in selected tanks to keep the rig at a depth, trim and heel as specified by the operator.

Circle 60 on Reader Service Card

Don't be.

Why the HX350S will make you feel better.

The Horizon HX350S is the new standard for 5W offshore handheld radios — if for no other reason than it's completely submersible — you can drop it in a bucket of water for half an hour, then take it out and use it.

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- You can charge from ship or shore power and you get an alkaline battery tray backup free.
- You'll have one touch access to Channels 16 & 9, ten weather channels, NOAA, and your two personal favorite channels.
- You can buy it in an intrinsically-safe version.
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Circle 61 on Reader Service Card

Oil Consumption of Medium Speed Diesel Engines

Reliability and availability are of paramount importance to all users of internal combustion engines. Inherent engine design reliability must be com-

plemented by a suitable periphery and the appropriate choice and treatment of working media such as lubricants and fuel.

CIMAC Working Groups have a long tradition of preparing recommendations and guidelines for the internal combustion engine industry and its users. In

performing this work, CIMAC takes advantage of its wide and competent international membership; Working Group -"Lubricant" is truly worldwide, with active members from Japan, U.S. and all round Europe/Scandinavia. Specialists from all relevant background - Equipment/Engine Manufacturers, Oil Companies, Additive Companies, Classification Society, Shipyard etc - meets twice a year and additionally in various sub-group to work on matters/guidelines/recommendations to help better serve the industry. The work is done on a voluntary basis.

The proof of its effort is shown by CIMAC Documents No. 13 and 15, which are Lubrication Guidelines for Trunk Piston Medium Speed Diesel Engines and two-Stroke cross-head diesel engines respectively. Success from these effort, has given impetus to the group in scoping other key industry issues, relating to lubrication, to work on. The WG has now completed another document entitled "Oil Consumption of Medium Speed Diesel Engines" and are also into the advance stages of finalizing four further documents, entitled as below, which are to be phased into the industry over 1999 to year 2000:

- The Impact of Fuels on Lubrication: 4 & 2-Stroke
- Lubrication of Large High Speed Engines
- Oil Degradation
- Gas Engine Lubrication

Oil Consumption of Medium Speed Diesel Engines

Today's medium speed engines vary in oil consumption from as low as ~0.15g/kW-hr to several times this figure. Added to the severity of low oil consumption, engine oil sump sizing is not getting any bigger. Against these complexity, there are a variety of engines in service — varying from medium/high speed engines (typically on distillate fuel) down to large medium speed engines of lower rpm traditionally on heavy fuel — which may have different practices with regard to oil sump changes, oil treatment, oil type etc. The requirement/impact of one engine on distillate fuel and with regular oil change interval (stipulated by the engine builder) is different compared to another on heavy fuel, and which works its sump to the oil condemning limit (based on used oil analysis) and changes its sump on that basis. All these gave good reason for a document to thoroughly discuss the issues and bring it to the

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attention of the industry.

In examining the parameters impacting on oil consumption in medium speed engines a range of factors were identified. Examples of these included engine design & operating conditions, the fuel quality and the lubricant quality. With respect to the engine design the power density is expressed by size and cycle parameters, lubricant charge expressed as kg/kW and lubricating oil consumption g/kWh are some of the parameters that affect the degradation of the lubricant.

For many large medium speed engines, ship owners have come to expect that periodic renewal of the lubricant charge is not necessary. Under normal operating conditions this view has been correct as the lubricant received periodic replenishment by the addition of make-up oil great enough to stabilize the oil at levels within the designers recommendations.

A low oil consumption/make-up invariably leads to partial or complete renewal of the charge when the increased stress due to reduced oil make-up causes oil parameters to fall below engine-builder recommended limit. This poses the question whether a low make-up rate is economical. The answer lies in the complex debate/interaction of make-up and renewal charge volumes. In comparing the whole life cost of different lubrication regimes account must be taken of the possible differential lubricant cost and also the cost of disposal of the used oil.

The document addresses oil consumption (defined as amounts of oil make up plus system charge renewal) required i) to keep the engine operating satisfactorily and ii) to control the oil quality within limits prescribed by the engine builder or suggested by the oil supplier. Major factors impacting on oil consumption are summarized together with the consequences of inadequate quantity/quality. It also offers some advice to cope with such situation.

ICAN Introduces Release II

International Communications and Navigation Limited, provider of marine electronic navigation and DGPS services has released new versions of its electronic charting system software — Aldebaran II and Regulus II for the Windows NT operating system. An upgrade to the company's ECS software, Release II provides many new features such as the ability to read multiple electronic charts, store and display routes and voyages, and adjust light levels.

The product, which is expected to be released this month, is — as with the company's previous releases — Y2K compliant.

ACR Introduces S&R System

ACR Electronics, Fort Lauderdale, Fla., has developed the RapidFix™ 406 — a 406 MHz EPIRB with a GPS interface. Dubbed as the next generation of EPIRB by ACR, RapidFix provides an entirely new functionality to the satellite-aided search and rescue system by

using a GPS NMEA 0183 interface. This new function adds latitude/longitude coordinates to the emergency signal transmitted by the unit, while precise position is immediately given to one of the new Geosar satellites in high-earth orbit. The cost-effective RapidFix is advantageous over combination EPIRB/GPS units because it eliminates

the need for a cold start initialization and can be installed with a direct connection to a live NMEA 0183 data source from a GPS receiver. In addition to the owner's unique, registered, coded 406 MHz signal, RapidFix transmits a homing signal on the 121.5 MHz SAR homing frequency.

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Deepwater - The Integrated Solution

The Deepwater Project is the largest, most innovative acquisition ever undertaken by the U. S. Coast Guard (USCG). Deepwater is delivering an integrated system of tools the men and women of the 21st Century USCG need to stand an effective and efficient watch on the front-line of America's maritime safety and security.

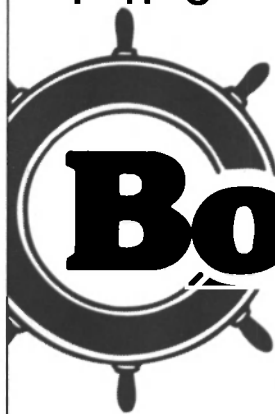
INTEGRATED DE

The Deepwater Philosophy

The Deepwater Project philosophy is truly unique in all of the federal government. With Deepwater, the USCG breaks the traditional federal acquisition paradigm and implements an innovative Mission-Based Performance Acquisition approach. Rather than focusing on specific assets, such as a class of cutter or aircraft, the Project developed a performance specification for an integrated system of assets that is based upon the fundamental capabilities needed to perform the entire portfolio of deep water missions worldwide.

The deep water region is defined as extending beyond 50 miles offshore, or situations/missions requiring extended on scene presence, or long transits to the operating area. Within deep water, the USCG is mandated by statute to per-

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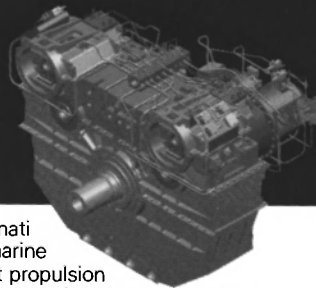


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form 14 operational missions in the areas of maritime safety, law enforcement, environmental protection, and national defense.

The Project's innovative approach affords several compelling advantages. By encompassing all of the USCG's Deepwater assets, the Project is able to determine the most effective types and efficient mix of assets. The focus on performance capabilities empowers industry to leverage innovative new technologies and processes.

Acquiring an integrated system of assets builds-in interoperability right from the start. Cohesive interoperability affords seamless coordinated performance of missions by multiple assets that produces an overall force multiplier effect.

Global Trends — Future Threats

In the 21st century, demand for USCG services is projected to increase. Studies by the Office of Naval Intelligence and others foresee global events — such as the doubling world population, the continued decline in marine fisheries, the end of the cold war, and the tripling of international commerce — greatly increasing the nation's reliance on the USCG.

As a result, the USCG can expect increased emphasis on the protection of the environment and living marine resources. Illegal immigration and drug smuggling will continue to be service priorities. The requirement to perform international operations either individually or jointly with other armed forces will increase. Overall, the USCG can anticipate a greater role as a unique instrument of national security.

Always Ready?

While the USCG stands "Semper Paratus," always ready, to face the many challenges of its deep water missions, the greatest threat confronting the service is that its deep water cutters and aircraft are aging and technologically obsolete. As a result, these platforms have excessive operating and maintenance costs and lack essential capabilities in speed, sensors, and interoperability that limit overall deep water mission effectiveness and efficiency.

Project Acquisition Strategy

The Deepwater Project is the USCG's answer to increasing service demands and pressing recapitalization needs. The Project is currently in Phase 1 Concept Exploration. Selected industry teams are researching and engineering their integrated Deepwater system concepts.

Phase 1 began last August with the award of Conceptual Design contracts to three industry teams - Lockheed Martin, Avondale Industries Inc., and Science Applications International Corp. serving as prime contractors. The chart at the bottom of the previous page provides a complete list of Deepwater industry team participants.

As noted on the Project schedule, an

independent USCG Roles and Missions Study are underway. This group is examining and may recommend changes to the current slate of overall USCG responsibilities. The Study's findings will be incorporated into industry's integrated Deepwater system designs.

During Phase 2, industry teams will develop final cost and technical propos-

als for their integrated Deepwater system concepts. Contract award to one team for the construction and implementation of the Integrated Deepwater System is scheduled for January 2002.

For further information on the Deepwater Project, log onto www.uscg.mil/deepwater

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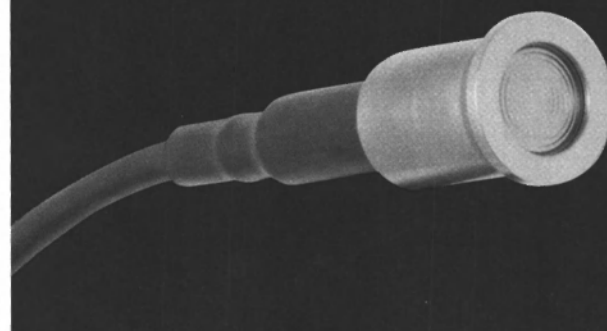
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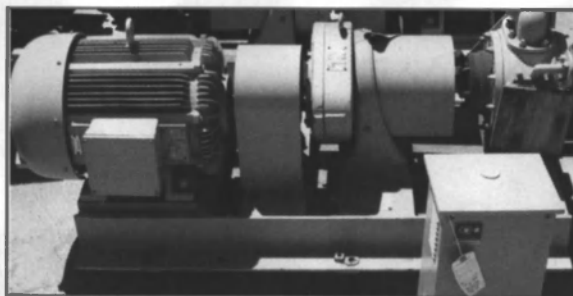
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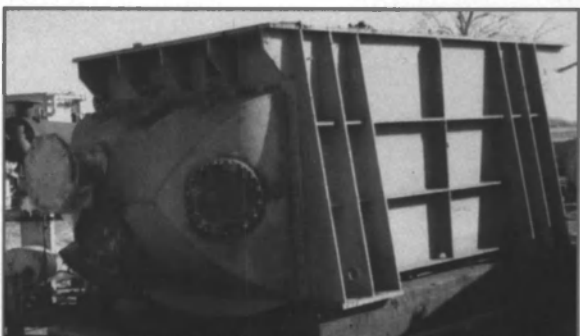
1 Bridge Crane 250'25 Ton Mfg: Ederer
146'-4" Circular Span 16 Bridge Wheels 24" Diameter
Cab-Operated Electric Traveling Bridge with Pendant
and Radio Controls
Motor: general Electric 75HP 460'3'60 | 165 RPM TEFC
Completely Disassembled, Most of Unit Stored Inside



17 Bilge Stripping Pumps Mfg: Blackmer
100GPM@60/70psig Horizontal Model BXL2.5NFA-NHRB
Motor: Tech Systems 1800RPM 400/3'60 TEFC With
Cutler-Hammer Control



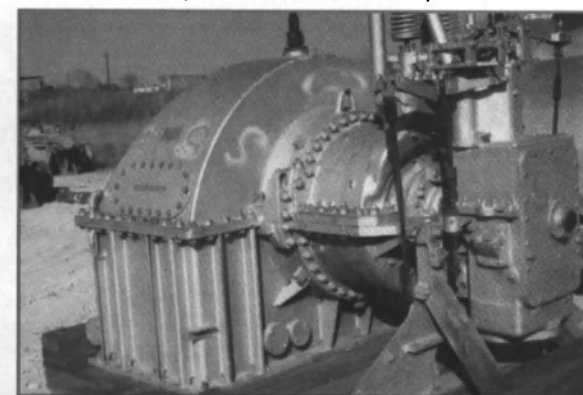
15 Foam Fire-Fighting Pumps Mfg: Blackmer
35GPM@200psi Horizontal Model BXL1/25NFC-TB
Motor: Reliance 7.5HP 440/3'60 With Controller,
Spares and Educator Assembly



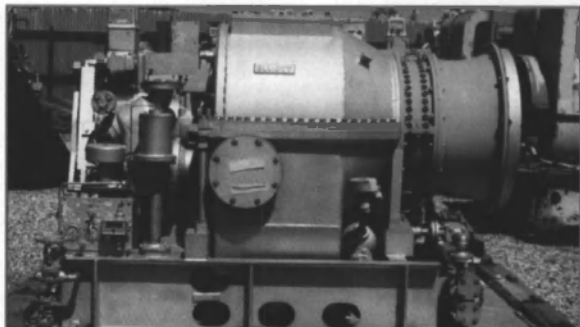
1 Unused Main Condenser Mfg: C.H. Wheeler
3800 sq. ft. 1 Pass 2446 Tubes of 5/8" OD and
0.049" Wall Thickness CuNi 70-30
9'8 1/8" Long Waterboxes of CuNi & Tube Sheets
180"x96"x92" High 18" Swing Bronze Check Valve on Ea. Unit



2 Fuel Oil Transfer Pumps Size 8x6 Mfg: DeLaval
700/525/350/250GPM@150psi Horizontal Model A32NX437
Motor: Continental 100/75/50/37.5HP 440/3'60 TEFC



3 Steam Turbines 6000HP Mfg: General Electric
5600RPM 410psi/725F Condensing to 28.5"Hg



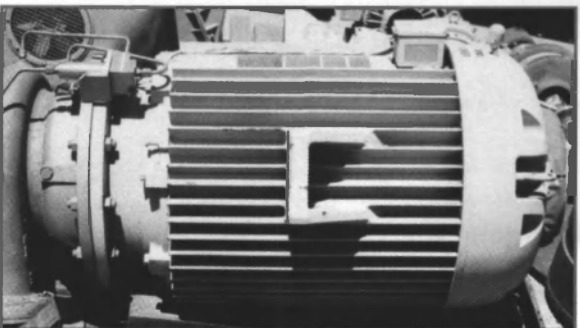
14 Forced Draft Blowers Size: 8 Mfg: Carrier-Elliott
35,600 CFM@ 118" Ps@7220RPM 2700 CFM@ 61" Ps@5474RPM
Model 44BH-2 916BHP Turbines: 575psig/530F 20psi Exhaust
Replacement Parts Available



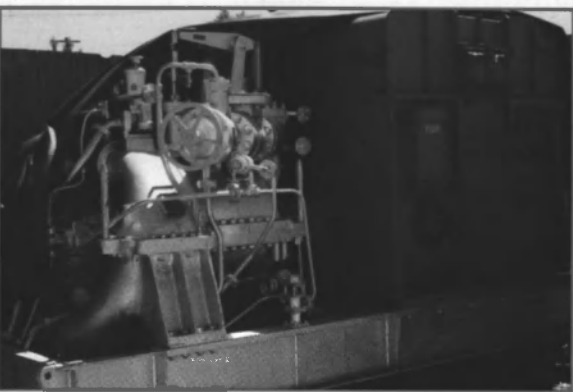
3 Circulating Pumps Size 8x8 Mfg: Carver
3000GPM@10.25psi Horizontal Bronze Casings
Motor: Reliance 40HP 440/3'60



1 Cargo Pump Mfg: Ingersoll-Rand
3000GPM @ 150psi Horizontal Bronze Casing Model 8SHW
Missing 500HP 1800RPM Motor



1 Fire Pump Size 5x6 Mfg: Worthington
1000GPM@125psi Vertical Titanium Casings Model 5DTVS-10
Motor: Hansome 150HP 440/3'60 TEFC



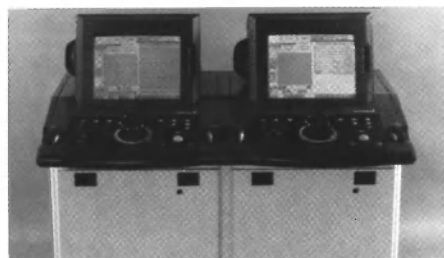
1 Turbogenerator 2000kW Mfg: Westinghouse
Model 3S61P537 285psi/417F 3600RPM 10 Stage
Generator: Westinghouse 2560kVA 3282Amps 450/3'60



6 Lube Oil Preheaters Mfg: Kim-Hotstart
P/N SPOL3P 12044X-FC-1012-SUB
Units Include Tuthill Model 2 CEV 6.2GPM Pump
Driven By 1 HP 230/460/3'60 | 140RPM Motors

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Alstom Awarded Contract For Positioning System



The Marine and Offshore Division of Alstom Drives & Controls has been granted a contract from Tidewater Marine for its duplex dynamic positioning system — DPS902 — for use onboard an ROV support vessel, which demands maintenance of a highly accurate position. DPS902 was selected for the newbuild ROV because of its dual redundancy for high reliability and the flexibility of the channels available for position measurement device input.

Tesoro Enters Agreement

Tesoro Petroleum Corp. has entered into a definitive agreement to sell all of its domestic Exploration & Production (E&P) business to EEX Corp. at a sales price of \$216 million. The transaction, which will occur on November 30 under the terms of the agreement, will be structured as a stock purchase. The sales price will be adjusted for transaction costs and certain price adjustments for business activity that occurs between July 1, 1999 and closing.

Conoco Extends FPSO Contract With Oceaneering

Conoco Indonesia has extended the charter of FPSO San Jacinto for an additional year at the Sembiland field, Block B, Indonesia. The vessel has been at Sembiland since 1994 with the contract extension allowing it to remain until October 2000. The FPSO was recently drydocked for steel and process plant repairs and has since returned to the field. The 12,450-dwt FPSO with production capacity of 11,000-bpd and storage for 53,000 bbl is owned by Oceaneering and operated by Conoco.

NovAtel Receives MSAS Order

NovAtel was granted orders to supply another 13 reference receivers to the MTSAT Satellite-based Augmentation System (MSAS) in Japan. With the order estimated at more than \$1 million, these receivers are scheduled for delivery during Q3 1999. NovAtel had previously supplied receivers to the MSAS program in 1998.

Superior Fabricators Awarded Cantilever Extensions

Superior Fabricators of Baldwin, La.,

has been awarded cantilever extensions for two Global Marine Jackup rigs, which are currently under tow into the Gulf of Mexico from West Africa.

The extensions will provide for an additional 15 ft. of cantilever reach for Glomar Adriatic IX and Glomar Adriatic X, both of which are LeTourneau 116-C class rigs.

Hale Hamilton Secures Surface Ship Orders

U.K. valve specialists Hale Hamilton have attained the first surface ship orders for their latest New Generation Reducing Stations (NGRS), which control key pressurized systems onboard.

About \$827,000 worth of business has been secured following contracts to provide ship sets for the Royal Netherlands

Navy's four De Zeven Provinciën Class Air Defence and Command Frigates (ADCF), which are currently under construction at the Royal Schelde shipyard in Flushing. Hale Hamilton's subsidiary in Germany is also supplying three ship sets of the New Generation Reducing Stations to the German Navy's new F124 frigate project building at HDW, Blohm + Voss, and Thiessen.

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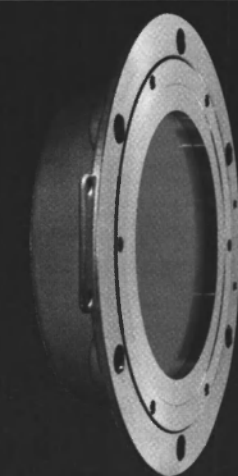
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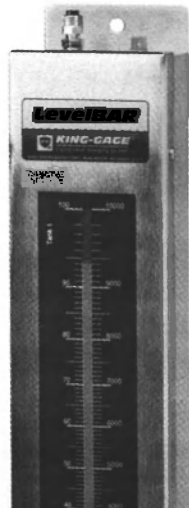


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New & Notable

Davie Celebrates World Premiere Of Petrobras 36

The large semi-submersible production platform formerly known as Spirit of Columbus was rechristened Petrobras 36 on August 31. Following two years of diligent work by more than 1,300 engineers, technicians and specialized Davie Industries workers, the completely refitted platform will soon be the stand-out platform of the Brazilian fleet.

With a capacity of 180,000 barrels of crude oil a day and 7.2 million cu.m. of gas per day, Petrobras 36 has the potential to be one of the most productive platforms in the world. Able to operate at depths of more than 4,429 ft. (1,350 m)

in the Roncador oilfield located 125 km off the coast of Brazil, Petrobras 36 is equipped with 89 underwater extraction flowlines more than 1.4 km in length, supplying close to 18 percent of Brazil's domestic oil production.

Circle 79 on Reader Service Card



Meyer Werft Lays Down The First Building Block

The first of about 60 blocks of the new cruise vessel Radiance of the Seas being constructed for Royal Caribbean International (RCI) was lifted into position in the covered building dock of the Papenburg, Germany-based Meyer Werft shipyard.



In the presence of the yard's managing owner, **Bernard Meyer**; and director, **Jochen Zerrahn**, RCI's site office manager, the 600-ton block, which measured 66 ft. (20 m) long was lowered onto the keel blocks.

The first of two luxury liners being built for RCI, the vessel will measure 89 ft. (293 m) and will carry 2,500 passengers at speeds of more than 24 knots. Featuring the technically innovative and environmentally friendly gas turbines, the vessel duo will be fitted with two podded drives of 360 degree efficiency comparable to an outboard motor.

Circle 80 on Reader Service Card

Rodriguez Delivers Fast Ferry



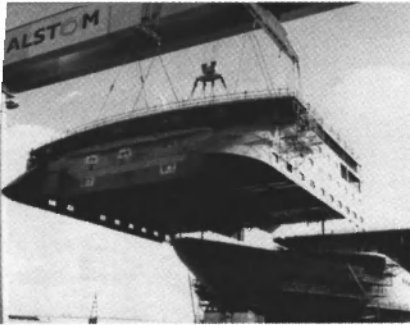
Rodriguez Cantieri Navali SpA delivered the fast ferry Aquastrada TMV 70 named Isola di Procida on September 10. Constructed for Caremar, the vessel will run the route between Naples to Capri and Sorrento at maximum speeds of 32 knots. Isola is equipped with the Rodriguez Stabilizing system SMS (Seaworthiness Management System), comprised of four non-retractable fins.

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Main Particulars

ClassificationRINA
FlagItalian
TypeTMV 70 Monohull
Length, (o.a)	.....233 ft. (70.9 m)
Waterline	.....210 ft. (64 m)
Hull depth	.....41 ft. (12.4 m)
Maximum draft	.....8 ft. (2.4 m)
Displacement	.....625 tons
Main engines	.....4 x MTU 16V 4000
Max. output	.....4 x 2,350 kW @ 2,100 rpm
Water jet	.....Kamewa
Fin stabilizers	.....Rodriguez Marine Systems
Couplings	.....SKF
Reduction gears	.....RENK
Engine controls	.....MTU
Deck machinery	.....Pellegri
Shafting	.....Armco
VHF radio	.....Telemar
Air conditioning	.....Il Frigorifero
Lifeboats/rafts	.....Viking
Cruise speed	.....29 knots
Range	.....280 nm
Passengers/Cars	.....550/57

Chantiers Completes Construction Of Mistral



The largest cruise ship to be constructed at Chantiers De L'Atlantique's Saint Nazaire yard since its France vessel, Festival Cruises' Mistral left the yard this past June for its maiden voyage in the Mediterranean and Caribbean. Measuring 209 ft. (63.7 m) with the ability to hold 1,200 passengers, the liner complies with the most recent safety regulations and pollution prevention. The Chantiers shipyards are concentrated on a location, which encompasses a pre-assembly area measuring 2,900 x 147 ft. where the ship sections leaving the pre-fabrication workshops are preassembled up to a weight of 750 metric tons, as well as a construction line measuring more than 2,900 ft.

Circle 82 on Reader Service Card

Cory Towage Welcomes New Oil Recovery Vessel



International towage and marine services company Cory Towage Ltd. has taken delivery of a new addition to its Mersey fleet with the recent arrival of the Oil Recovery Vessel (ORV) Pollgarth in Liverpool. The vessel was jointly ordered by Cory following the award of a long term contract by Mersey Docks & Harbour Company earlier this year to supply and operate the ORV on the River Mersey, the Manchester Ship Canal and at the various Mersey ports and terminals.

Pollgarth was built in the U.K. by OMI Limited at the Cosens Engineering yard in Portland, Dorset, and arrived in Liverpool after a 460 mile, five day journey around the west coast of Britain. The 61 ft. (18.5m) catamaran is fitted with a roll mop and is capable of collecting up to 50 tons of oil an hour

and discharging to shoreside reception facilities. In addition to maintaining the vessel, Cory Towage is responsible for routine testing and operation in the event of an incident.

The ORV is just one example of how Cory Towage is extending its marine services and broadening its activities.

Island Ferries Receives New Monohull Vessel

Wavemaster Intl. has completed a new 272-passenger high-speed monohull ferry for Island Ferries, Galway, Ireland. Measuring 123 ft. (37 m), the aluminum vessel was commissioned on August 19,

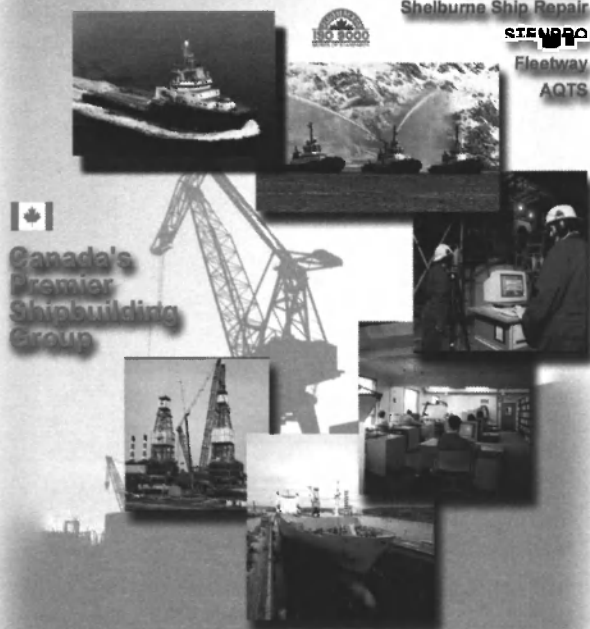
1999 for a 10 nm journey transporting commuters and tourists between Galway and Aran Island.

Named Draiocht Na Farraige (Magic of the Sea), the vessel was designed and built by WaveMaster International and incorporates a substantial keel, fine entry lines and steep deadrise. Two

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Circle 355 on Reader Service Card

New & Notable

chines provide the hull with a narrower waterline beam underway for speed, while adding stability and buoyancy as the

Top: The Draiocht Na Farraige (Magic of the Sea) designed and built by Wavemaster for Island Ferries. **Below:** Cat Electronic Monitoring System (EMS) installed in Island Ferries' Pilot House.



vessel slows down and the hull immerses. The ferry is powered by three CAT 3412 C marine engines, each rated 1,050 bhp (783 bkW) at 2,300 rpm, driving 39-in diameter Teignbridge Aquaquin propellers through ZF BW 190 marine gears. Service speed is 24 knots.

Main Particulars

Measurements 123 ft. (37.4 m) x 26 ft. (8 m)
Marine gear 3X ZF BW 190, 2.571: reduction
Propellers 3X Teignbridge Aquaquin 39 x 41-in.



Austal Delivers Patrol Boats

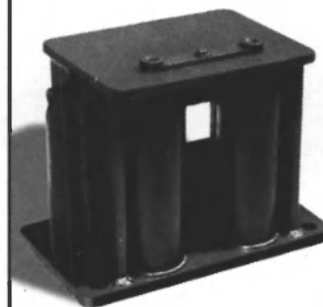
Austal Ships recently delivered the first two of its eight part patrol boat series — Holdfast Bay and Botany Bay — to the Australian Customs Service. Holdfast Bay, which was commissioned in October, joins its sistership Botany Bay commissioned on September 16 by the minister for finance and administration, **John Fahey**. The 125 ft. (38 m) aluminum hulled patrol boats will be an intricate part of the Australian Customs Service fleet of patrol vessels and will complement Customs Coast-watch aircraft, providing a national civil surveillance and response service. Capable of operating around Australia's 37,000 km. coastline, the vessels have



Botany Bay and Holdfast Bay were delivered to the Australian Customs Service National Marine Fleet in August 1999.

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Maritime Reporter/Engineering News

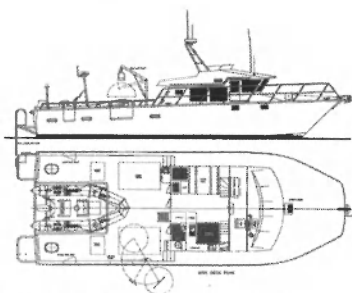
ange of 1,000 nm at 20 knots. Named for various bays around the Australian coastline, the Bay Class patrol Boats are fitted with a bowthruster to aid with maneuverability during inclement weather conditions and are able of moving sideways at a minimum of 66 ft. (20 m) per minute.

Circle 83 on Reader Service Card

Main Particulars

Flag	Australian
Class	DNV
Length (o.a)	125 ft. (38.2 m)
Length (waterline)	105 ft. (32.1 m)
Beam	24 ft. (7.2 m)
Hull depth	15 ft. (4.5 m)
Hull draft	7 ft. (2.2 m)
Engine	MTU
Gearbox	Reintjes
Propellers	Veem
DWT	28 tons

Kvichak Readies To Deliver Catamaran



Kvichak Marine Industries is currently building a 54 ft. (16.4 m) catamaran scheduled for a January 2000 delivery to California Fish & Game. Designed by Teknikraft of Auckland, New Zealand, the vessel is one of a trio of catamaran designs being built at the yard's new Seattle facility.

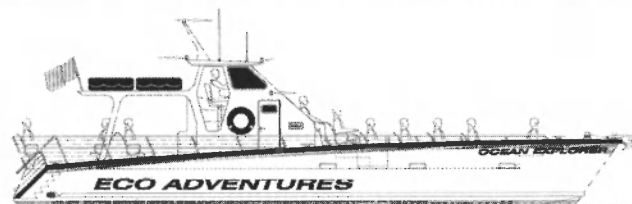
To be named Thresher, the partially foil-supported catamaran will be stationed in Dana Point as a Fish and Game Marine Enforcement patrol vessel for Southern California. The all-aluminum catamaran, with a beam of 20 ft. (6 m), weighs about 25 tons fully loaded and is powered by twin CAT 3196 DITA diesel engines.

The CAT pair will drive 30-in. stainless steel propellers through Twin Disc 5114A gears at a cruising speed of 26 knots. Deck equipment will include an aft-deck A-frame to deploy and retrieve a customer supplied Hurricane inflatable. The vessel's top speed will clock in at 30 knots.

Circle 84 on Reader Service Card

Kvichak And Morelli & Melvin Team Up On Catamaran

Kvichak Marine Industries is readying its 54 ft. all-aluminum catamaran, Ocean Explorer, for a December delivery to Pacific Whale Foundation of



Kihei, Hawaii. The 54 x 14 ft. (16.4 x 4.2 m) vessel, which will operate year-round for the Foundation's Eco-Adventure Cruises, holds the designs of both

Kvichak and Morelli & Melvin of San Diego, Calif. Ocean Explorer's venue includes snorkeling, dolphin watching and whale watching tours of Maui's Lahaina Harbor. Propulsion power will be provided by twin Cummins 6CTA diesels,

each rated for 430-bhp at 2,600-rpm driving 28-in. diameter four-blade, stainless steel propeller through a ZF down-angle marine transmission.

Cruising at a speed of 23 knots, passengers will be seated in Ocean Outdoor model all-weather seats constructed by Beurteaux of Australia.

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New & Notable

LaForce To Build For Veteran Louisiana Operator

Towboater Audrey Dufrene of Belle Chasse, La. has called on LaForce Shipyard in Bayou LaBatre, La. to construct its new 74 x 28 ft. (22.5 x 8.5 m), 1,600-hp pushboat. Incorporating a semi-cam-

ber design from the keel to the chine on the underside of the aft hull, the vessel will house a pair of Cummins 12-cylinder KTA38 MO engines at 800-hp each linked to Twin Disc gears with a 6.39:1 ratio. Upon its December delivery, the pushboat will be the fourth in a fleet of American Tugs' fleet of tow boats avail-

able for charter work on inland waterways.

Wallenius Accepts Delivery Of MV Mignon

Wallenius Lines has received a specially built car-carrier, MV Mignon,

from Korea-based Daewoo Okpo Shipyard. The new PCTC ship (Pure C Truck Carrier) is capable of holding up to 5,850 cars or a combination of 3,000 cars and 475 heavy vehicles loaded via an internal ramp system.

The newbuild is the tenth of a series of car-carriers that have been built by Daewoo between 1994 and 1999.

U.S. Military Modules Will Be Cummins Powered

A large ship arrives off a port devastated by natural or military forces. The ship contains badly needed supplies but the port infrastructure has been destroyed. This and other scenarios can stall the best-planned sealift logistics, but now an innovative new program has designed, and is building, the solution.

A description of Joint Modular Lighter System (JMLS) as published on the Home Page at the Seabee Logistics Center (formerly CESO) explains the requirements: "The Joint Modular Lighter System (JMLS) will be a new system comprised of powered and non-powered floating platforms. The platforms shall be assembled from International Organization of Standardization (ISO) container compatible interchangeable, modular components (modules) and other equipment. JMLS will be used to support Commander in Chief (CINC) Organization & Operations plans.

The purpose of JMLS is to provide the CINC a method of discharging dry cargo from Strategic Sealift Ships and moving cargo to shore in the event a port is denied, degraded or not available. JMLS will permit dry cargo throughput through sea state 3 conditions. In addition, the system shall be fully interoperable with all Joint Logistics Over The Shore (JLOTS) equipment and have maximum flexibility to be adapted to multiple uses in support of Logistics Over The Shore (LOTS) and JLOTS operations. JMLS will accommodate both Roll-On/Roll-Off (RO/RO) and Load-On/Load-Off (LO/LO) of rolling stock and cargo."

The JMLS is a phased acquisition program. Currently in Phase two, the JMLS project has adopted an Integrated Product and Process Development (IPPD) as the fundamental approach to satisfying program requirements.

A contractor team comprised of CDI Marine Company Baltimore Marine Industries, Band Lavis and Associates,

(Continued on page 86)

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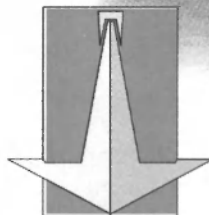
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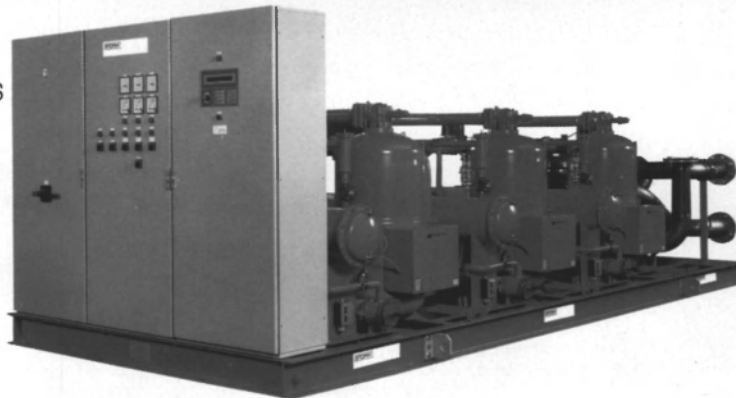
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Circle 3: 8 on Reader Service Card

(Continued from page 84)

and American Management Systems are partnered with the Naval Facilities Engineering Command and other Government agencies to demonstrate the advancements represented in the new system.

Cummins Marine engines were selected for the powered modules. The new six-cylinder, 19-liter, electronic fuel system QSK19 engines with an enhanced 760 HP rating are being mated to Omega's water pump drive units at the firm's Netherlands plant prior to shipment to the U.S. for installation in the modules. The drive units as they arrive at Baltimore Marine Industries (BMI) for installation in the roughly 40x8x8-ft. modules are approximately 35x7x4 ft. wide. They enclose the engine and a horizontal propeller that draws water up from the bottom to a rotating drum from which it can be directed out through four ducts that provide both propulsion and steering. Cooling pipes for the engine's heat exchanger are internal to the thruster ducts.

While relatively new to the American market, similar propulsion systems are in use on Europe's inland waterways. At least one U.S. inland waterway operator is installing a Cummins-powered Omega unit on the front of a petroleum products barge. Baltimore Marine Industries' Richard Ralph reports that the first of the un-powered modules are currently undergoing marine testing. The first of the powered modules are expected to be ready for sea trials in late November or early December. Current plans, in this phase, call for a total of 56 non-powered and four powered modules to be built over the next three months. These will then go into a test program to demonstrate the functionality of the system.

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Circle 293 on Reader Service Card

Maritime Reporter/Engineering News

People & Company News

Burns Chosen As New Director

The American Waterways Operators (AWO), has elected **Anne Davis Burns** as its new director of public affairs. AWO is the national trade association for the tugboat, towboat and barge industry. Burns joins the Association's senior advocacy team to oversee public outreach efforts, including a new image campaign recently undertaken by AWO to provide education on the industry and its Responsible Carrier Program.

M. Rosenblatt Promotes Vlaun

M. Rosenblatt & Son (MR&S) has promoted **Richard C. Vlaun** as technical director responsible for nine technical sections and more than 200 personnel. Vlaun joined MR&S as senior project engineer after retiring from the United States Coast Guard in September 1998.



Cenargo Acquires Norse Irish Ferries

Cenargo International, owner of Merchant Ferries and Belfast Freight Ferries, has completed its acquisition of Norse Irish Ferries, operator of a twice-daily ferry service carrying passengers between Liverpool and Belfast. Neither Cenargo nor the vendor, Grover Star Shipping Corp., has revealed the transaction value.

Autronica Extends Distribution Agreement

Autronica Marine USA of Northvale, N.J. and Navia Maritime, Division Autronica A/S, Trondheim, Norway, have extended their 18-year association via a new Exclusive Distributorship Agreement.

The signing of this document ensures that Autronica Marine USA is the sole exclusive U.S. distributor/service provider for Autronica, thus continuing to supply and support their U.S.-based customers, as well as vessels housed with Autronica when calling in U.S. ports.

Aalborg Elects New R&D Manager

Aalborg Industries, Denmark appointed **Bent Ørndrup Nielsen** as R&D manager of the company as of August 1999. Nielsen, who began his career with Aalborg Shipyard calculating ship propulsion plant and machinery, will head further development of the compa-

ny's Mission™ boilers and control systems.

PRIME Completes Pierside Repairs

Pacific Rim Industrial Marine Engineering (PRIME) marked its first year of

operation with the completion of pier-side repairs and alterations to super-tanker Denali.

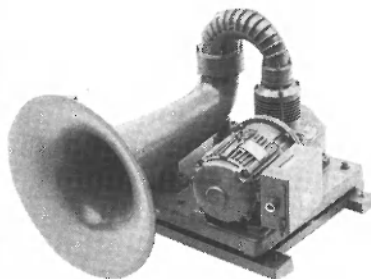
Since moving to Port Angeles, Wash. in the fall of 1998, the company has performed nine tanker pierside repair availabilities on vessels such as Prince William Sound and Tonsina. Repairs have also been accomplished on a dozen

vessels at anchor in Port Angeles harbor.

Specializing in voyage repairs and UCCG Critical Area Inspection Program (CAIP) surveys and repair, the company's facilities include a complete machine shop and steel structural fabrication shop, as well as a pipe and valve repair shop.

Circle 54 on Reader Service Card

HEAVY-DUTY SIGNALS by Kahlenberg



Model S-120 Piston Horn

Chosen for use on aircraft carriers as well as commercial vessels over 200 meters in length, the S-120 utilizes an oscillating piston driven by 7-1/2 horsepower 3 phase 220/440 volt electric motor producing 143 dB and a fundamental frequency of 94 Hz in 1/3 octave band at one meter.



Kahlenberg Signals were developed to withstand the punishing use of commercial and military service. Their durability has been demonstrated over decades of service on ocean-going vessels ranging from naval warships to commercial vessels. Military specifications have required extensive testing for many of these whistles and the accessories supplied with them, which have proven the exceptional qualities of Kahlenberg design and manufacturing.

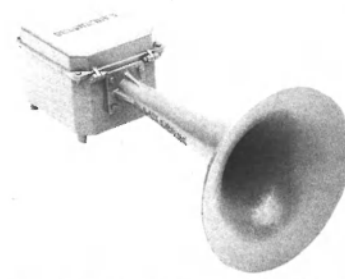
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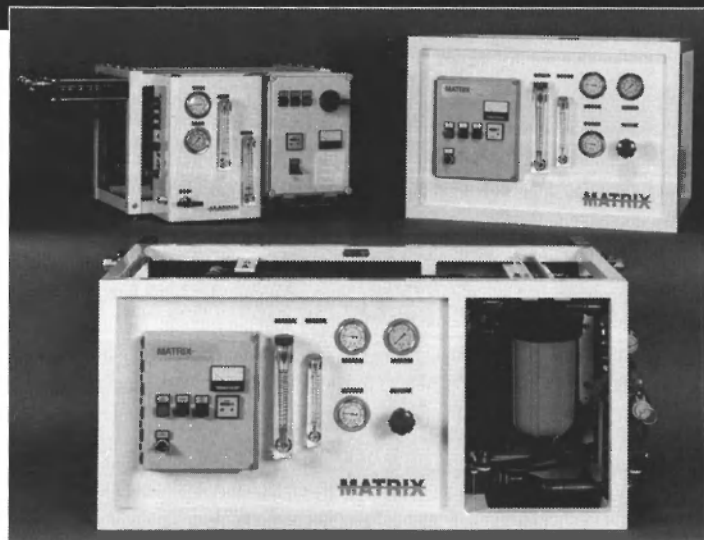
Model S-203C S-203 CHT

For vessels over 75 meters in length, this design allows both whistles to exceed 143 dB (1/3 octave band). The S-2036 and S-203 CHT are virtually maintenance free. Durability is ensured by the use of bronze and marine aluminum construction materials throughout. For the most extreme cold weather operation, Model S-203 CHT (shown) includes a thermostatically controlled, heated enclosure for both the combination manual/electric valve, and the horn sounding body.

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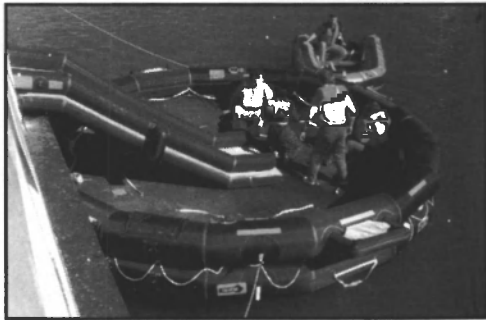
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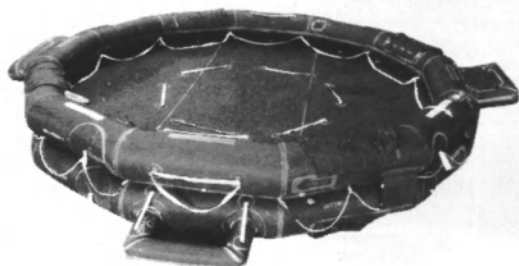
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People & Company News

MSC Celebrates 50 Years

"MSC has been conspicuous because its people and ships generally have been where the action has been." Rear Adm. **Bruce Keener III**, USN Commander, Military Sealift Command, 1979-1981

Rear Adm. Keener made this observation on the U.S. Navy Military Sealift Command's 30th anniversary in October 1979. His words still hold true 20 years later as MSC, the ocean transportation specialists for the Department of Defense, celebrates its 50th anniversary.

Today, MSC operates about 120 ships worldwide with 100 more ships in reserve status. What sets MSC ships apart from other Navy ships is all MSC ships are crewed by civil service or contract merchant mariners instead of active duty Navy people. Using civilian crews frees active duty Navy personnel for more traditional war-fighting assignments.

MSC ships wear many hats for DOD. MSC Naval Fleet Auxiliary Force (NFAF) ships support the U.S. Navy fleet around the world, providing everything from fuel to food to ammunition and towing services. NFAF ships keep the Navy's combatant ships at sea, on station and combat ready.

MSC Special Mission ships provide many specialized services for the Navy and the federal government including surveying the world's oceans and performing counter-drug operations. MSC Special Mission ships work with scientific and military commands to expand our knowledge of the world's oceans, combat drug smuggling, monitor international compliance with strategic arms treaties and lay submarine cable.

MSC Sealift ships transport military cargo and fuel quickly wherever they're needed to hotspots like the Balkans and remote areas such as Thule, Greenland.

In the past year, MSC ships delivered aid to Hurricane Mitch-ravaged Central America, provided logistics support during the Kosovo crisis and maintained a presence in places such as the Persian Gulf and the Indian Ocean.

Today's MSC is an outgrowth of four different agencies that provided ocean transportation for the U.S. military through World War II: the Naval Transportation Service, the Army Transport Service, the U.S. Maritime Commission's War Shipping Administration and the Navy's Fleet Support Services.

Following World War II, U.S. military leaders sought a better system. Military Sea Transportation Service, MSC's name prior to 1970, was established on Oct. 1, 1949, to be the U.S. military's ocean transportation provider.

The MSTS mission expanded in 1958 to include the operation of scientific support ships vessels involved in oceanographic research, missile tracking, communications and other special

missions.

MSTS continued to define its role within the Navy and DOD in the 1960s. MSTS ships transported people and supplies to and from Southeast Asia during the Vietnam War. MSTS ships also supported the Apollo 11 mission to the moon in 1969.

MSTS began the 1970s changing its name to Military Sealift Command. In 1972, MSC began operating its first Naval Fleet Auxiliary Force ship, civilian mariner-crewed fleet replenishment oiler USNS Taluga. Today, MSC operates about 30 NFAF ships working side-by-side with the U.S. Navy combatant fleet worldwide.

The Ready Reserve Force, owned and maintained by MarAd reduced operating status, but under MSC control when activated, was established in 1976. The RRF ships fill ocean transportation needs the commercial maritime industry may be unable to fill for the U.S. military during contingencies.

In the 1980s, MSC introduced afloat prepositioning ships vessels laden with combat equipment and supplies and prepositioned at sea within several days sailing time of potential contingency areas.

The seven initial Near Term Prepositioning Ships, operating near Diego Garcia in the Indian Ocean, were the forerunners to the Maritime Prepositioning Ships operated by MSC for the U.S. Marine Corps, which began service in 1984.

The first Navy Combat Logistics Force ships built specifically for MSC operation, the Kaiser class fleet replenishment oilers, also began delivery in the 1980s. In addition, the Sirius class combat stores ships, purchased from the United Kingdom, joined the MSC force.

MSC showcased its sealift and prepositioning capabilities in Operation Desert Shield in 1990-91. At the peak of strategic sealift activity, MSC operated 212 dry cargo ships and 22 tankers. Chief of Naval Operations Adm. **Frank B. Kelso II**, USN, awarded MSC a Navy Unit Commendation, MSC's first, for its execution of strategic sealift in support of the war.

As a result of lessons learned from the Persian Gulf war and changing world dynamics after the fall of the Berlin Wall, DOD expanded afloat prepositioning and surge capabilities, building 19 large, medium-speed, RoRo ships for MSC operation. The last of the 950-ft. (289.5 m) behemoths nearly as big as an aircraft carrier is scheduled for delivery to MSC is 2002.

Throughout the 1990s, Navy leaders continued to transfer active duty crewed Combat Logistics Force ships to MSC operation. A total of seven Kilauea class ammunition ships and three Mars class combat stores ships are currently operated by MSC.



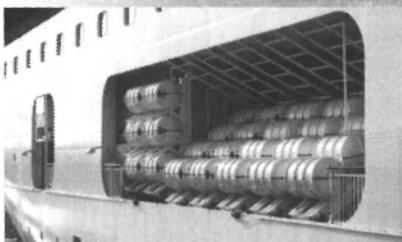
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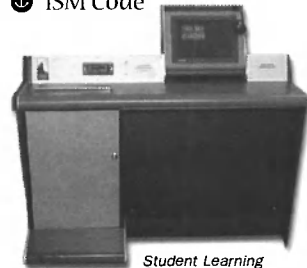
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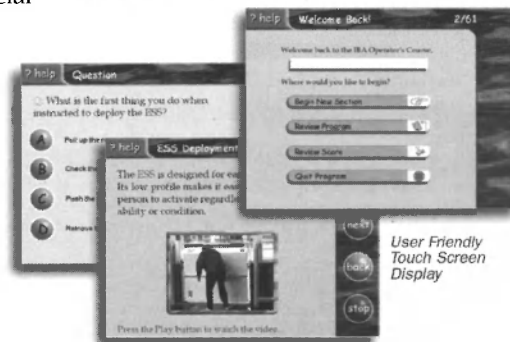
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People & Company News

Shannon Tugs Signs Three-Year Extension

Shannon Tugs, a 50/50 joint venture between Cory Towage and Marine Transport Services, has signed a three-year extension to its existing contract

with Foynes Port Authority. The company has upgraded its tug fleet to accommodate larger vessels, which are expected to be calling at Foynes.

Currently expanding its facilities, the Port of Foynes has just finished a \$16.6 million extension to its main jetty, bring-

ing the quay length to 886 ft. (270 m). An additional \$3.3 million will be used for dredging and new navigation lights, according to FPA's harbormaster, Captain Senan Histon.

ARCOMS Appoints New MD

Advanced Remote Communication Solutions (ARCOMS), formerly Boatracs, has appointed John Yates as managing director, ARCOMS Europe, effective October 1.

In addition to managing the company's European operation, Yates will be responsible for establishing a global satellite and terrestrial communications infrastructure.

Autoship Delivers Its Newest Program

Autoship Systems Corp., Vancouver, has delivered Release 1.0 of the WW Load Planning System (WW LPS) software program to Wallenius Wilhelmsen of Stockholm, Sweden. A voyage-based stowage planning program for containers and RoRo cargo, WW LPS keeps track of all stowage plans at all ports of call for a ship's given voyage. The program includes a type-approved hydrostatic engine. All hydrostatic and stability values, such as longitudinal strength, drafts, displacement and torsional moments are updated automatically to show the vessel's current loading status.

Circle 78 on Reader Service Card

BFGoodrich's Grid-Lock Now Available Commercially

The Aerostructures Group of BFGoodrich Aerospace has made its Grid-Lock structural technology available for use in commercial industries as a new, upgraded alternative to conventional structural designs.

Adopted in 1995 by Boeing, Grid-Lock provides a lighter, stronger, flexible and more cost-efficient panel technology and requires fewer parts, less assembly and dedicated labor.

The product also offers commercial industries the option of reducing costs on procurement, production, labor, maintenance and replacement. High-volume production methods can construct near, net-shaped Grid-Lock panels rapidly and effectively.

Circle 55 on Reader Service Card

American Teratec Expands

American Teratec of Northvale, N.J. has extended its portfolio of safety systems for ships, offshore and industrial applications. Representing Omicron of Tønsberg, Norway, American Teratec now provides fully certified gas sampling, detection and alarm systems for hydrocarbons, oxygen, hydrogen sulfide and other specific gas types. Used for ballast tanks, void spaces, pump rooms and vapor lines, up to three different gases can be monitored by one system.

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Newport News Wins Two Ship Repair Contracts



Alex Bonnyman, a Military Sealift Command (MSC) pre-positioning ship chartered through Maersk Lines.

Newport News Shipbuilding (NNS) has been awarded two separate contracts for shiprepair work for vessels M/V 1st Lt. Alex Bonnyman and SS Cape Nome.

Bonnyman, a Military Sealift Command (MSC) pre-positioning ship chartered through Maersk Lines, will undergo hull blasting and painting; tank blasting and painting; overhaul of deck cranes; survey and repair of main propulsion equipment and repair of machinery components.

Measuring 775 ft. (236.2 m) with a beam of 90 ft. (27.4 m), Bonnyman arrived at NNS on October 1 where it remained for about one month.



Cape Nome, A MarAd cargo ship managed by American Overseas Marine Corp. (AMSEA).

A MarAd cargo ship, the 602 ft. (183.4 m) Cape Nome, which is managed by American Overseas Marine Corp. (AMSEA), arrived at NNS on October 4 for inspection of sea valves and testing for structural integrity for a period of six days.

ICO Wins Backing From Investors

ICO Global Communications has received non-binding letters of intent for debtor in possession financing from strategic investors in excess of \$225 million, the amount needed to finance the company's immediate cash needs. The non-binding letters were reported to the bankruptcy court in Delaware.

Successful completion and funding of the \$225 million debtor in possession financing is subject to the receipt of non-binding financing commitments for the balance of the company's financing requirements and satisfaction of certain other conditions.

The debtor in possession financing

also is subject to approval of the U.S. Bankruptcy Court and the Bermuda and Cayman Island courts.

Prüftechnik Joins Up With Wibrem

Pruftechnik of Ismaning, Germany,

and Wibrem, of Wroclaw, Poland, have entered into a new joint venture with the goal of combining the diagnostic and service activities of both firms within a new enterprise. Known as Pruftechnik-Wibrem, the company's CEO will be **Marek Dudzinski**, whose team from the parent company Wibrem will be

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People & Company News

joining him in this new venture.

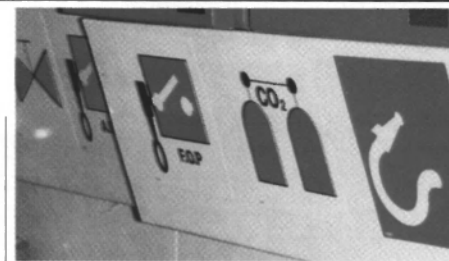
The Prüftechnik-Wibrem conglomerate will initially focus on laser-optical alignment of turbines and other drive assemblies. Additional services will include the whole spectrum of machine

diagnostics, including signal analysis.

Yfestos Pictograms Implemented On Patrol Vessel

The Finnish patrol vessel Telkka has

implemented green luminescent Yfestos pictograms produced to IMO specifications by Beele Engineering B.V. The vessel, built by Udenkaupungin Tyovene Oy, is the first to be completely equipped with the luminescent and



Onboard the Finnish patrol vessel Telkka, large-scale use is made of green luminescent Yfestos pictograms produced to IMO specifications.

temperature-resistant pictograms.

The pictograms' functions are intended to indicate escape routes, the advised direction to walk and rescue equipment, as well as the ability to identify equipment and systems that are dangerous to touch, mainly pumping systems and high-voltage systems.

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Columbia Coastal Appoints New GM

Columbia Coastal Transport, LLC, has appointed Joseph Villa as general manager operations, based in the company's Clark, N.J. headquarters. Before joining Columbia, Villa spent 18 years with Sea-Land Service.

Oceaneering International FPSO Reaches Milestone

Oceaneering International's FPSO Ocean Producer recently

THE MARINE FLOORING SINCE 1957

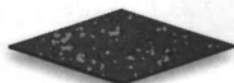


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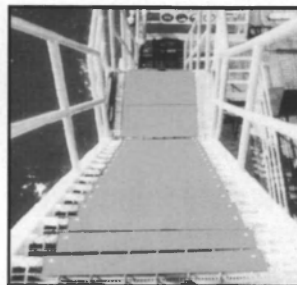
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Circle 327 on Reader Service Card

surpassed the 10-million-barrel milestone for oil production at Kiabo field, Block 4, Angola. Ocean Producer has been operating at Kiabo since January 1994 under contract to Sonangol P&P, the exploration and production division of Angola's national oil company.

Converted in 1991 by Oceaneering under contract to Amoco Production Company for service offshore Gabon, the FPSO was designed for efficient, low-cost production of marginal fields. The initial contract with Sonangol was for one year plus two option years; a new four year contract was signed in 1996.

Seventh District Names Moore As Chairman

Michael T. Moore, head of the marine and aviation law practice at Holland & Knight LLP in Miami, Fla., has been appointed chairman of the Seventh District of the Coast Guard Foundation's Board of Directors. Moore, who will be the principal contact between the foundation and the Seventh District, will also coordinate activities of the directors in the district, which extends from South Carolina to Puerto Rico.

Lloyd's Receives Authority From AMSA

Lloyd's Register has been given authority from the Australian Maritime Safety Authority (AMSA) to certify materials and equipment for use on ships registered by the Australian Administration. This authority encompasses fire fighting equipment and structural fire protection components, lifesaving appliances, navigation and Marpol equipment.

Lloyd's also stated that now is the time for shipowners to address NOx testing. Once Regulation 13 and Regulation 16 of Marpol 73/78 Annex VI come into force, diesel engines and incinerators on ships built after January 1, 2000, will have to comply with NOx emission standards.

Per these requirements, engines and incinerators will be the basis of a series of survey and certification tests, which includes a pre-certification engine survey to confirm the engine design and operation meets NOx emission limits.

Dex Launched As New Hull Insurer

A new name has made its debut on the international marine insurance scene with the official launch of Dex, a new hull insurer based at Lloyd's, created through a joint venture between Thomas Miller, Swiss Re and Chartwell Re.

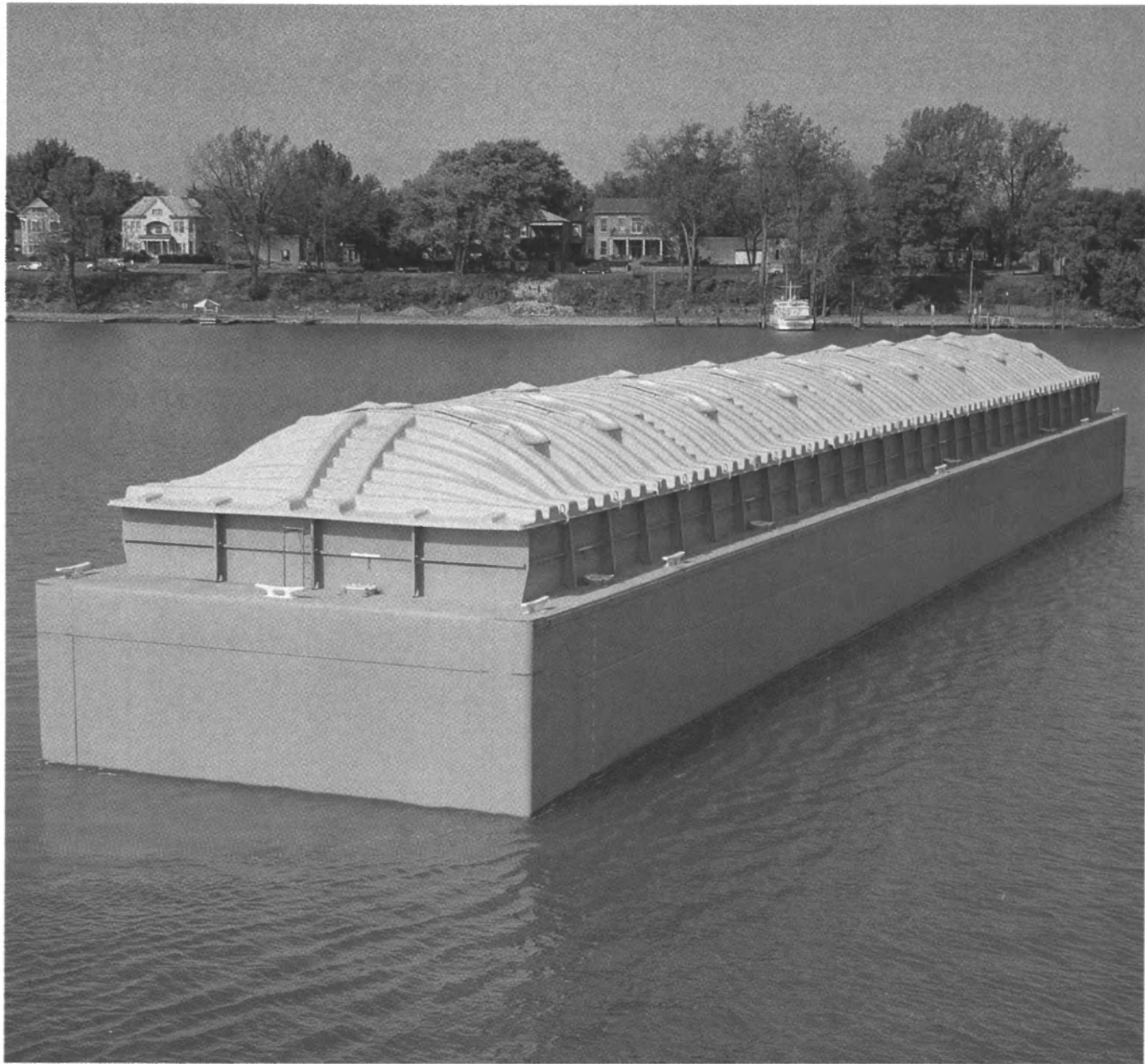
Dex will provide practical hull insurance solutions created for the new millennium. It is the culmination of almost two years' collaboration between the three parties and promises to break the mold of traditional hull insurance products by offering more transparent, accessible and practical products and

services.

Dex will begin underwriting in the European, Asian and North American markets on January 1, 2000 with the capacity to underwrite 100 percent lines on ships up to \$100 million in value. Further underwriting facilities around the world will be opened in due course.

Furuno Adds Kauzlaric

Furuno U.S.A. has created a new advertising and communications department with Jeff Kauzlaric as advertising and communications manager. Kauzlaric previously served as an account executive and Internet director with Bear Advertising.



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Proform covers, which is building fiberglass covers at its new state-of-the-art facility in West Memphis. So if you want the best fiberglass-covered hopper barges in the industry, call Barker or Rick at 812-288-0200.

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Kamewa Announces Propulsion Breakthrough

The Kamewa Adjustable Bolted Propeller (ABP) represents a major breakthrough for operators of large merchant ships, according to the system's developer, the well-regarded Kamewa Group. The ABP was designed to have the simplicity of a fixed pitch propeller, yet cost no more to transport and install than a standard CP propeller. Pitch angle can be adjusted in situ, and blades can be replaced underwater without the need for drydocking. The trend for higher propulsive power now found onboard large ships such as oil tankers, bulk carrier and containerships has simultaneously generated a need for larger propellers. Due to the high weight and bulk, handling and transportation of the large, monobloc props, however, often proves costly. The Kamewa ABP (patent pending) is similar in concept to a standard CPP. The ABP consists of a hollow hub mounted on the shaft by a flanged connection with bolted on blades. The major difference between the ABP and CPP is that only minor pitch adjustments can be made on the ABP and these are carried out manually on the hub. The ABP uses a unique type of bolt that can be tightened using light hand tools from the inside of the hub. Finally, Kamewa touts advantages for the shipyard, including fast, simple installation and no need for match marking.

Circle 193 on Reader Service Card

MorAD CD-ROM

Now Available

The Maritime Administration (MarAD) has introduced its Ship Operations Cooperative Program Boiler Automation Inspection (SOCP) CD-ROM. Developed and offered by SOCP, the product assists with the progress of streamlining boiler automation inspection procedures and training.

The intention of the CD-ROM is to perform two functions within the inspection of Boiler Automation Systems, the first being a step-by-step procedure enabling the ship's crew to implement a streamlined inspection procedure. This step also entails preparation of the documentation necessary to obtain USCG approval of the procedure.

The second function involves training of the crew to conduct a typical Boiler Automation System Inspection. This is a multi-presentation of the tasks to be performed to carry out a typical inspection of a Boiler Automation System.

Sparta To Introduce Kaleidoscope Marine Carpet

Sparta Carpets, Dalton, Ga., plans to present its multi-colored carpet line, Kaleidoscope, at IBEX 2000. Manufactured from computer driven tufting equipment, the new styles will incorporate various proven marine colors in a variety of patterns. Available in widths ranging from 6 to 12 ft., and weighing 16, 20 and 24 oz., the Kaleidoscope styles will offer the vessel manufacturers an opportunity to enhance the look and design of their vessel — without changing any part of their manufacturing process.

The patterned marine carpet will structurally match existing solid colored cut piles currently being used today.

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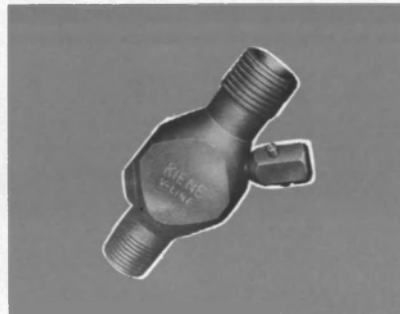
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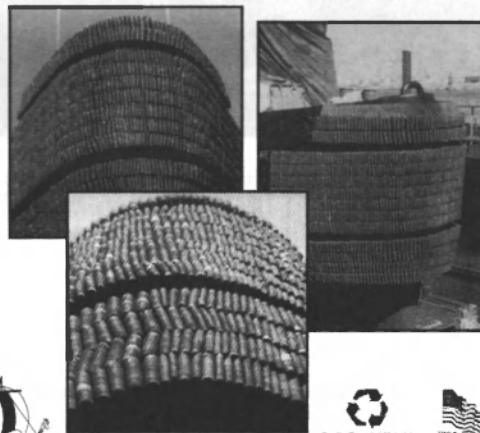
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Maritime Reporter/Engineering News

ABS OIL TESTING SERVICES

Summary of Fuel Oil Samples analyzed at select ports, September 15, 1999

ABS Oil Testing Services is recognized as a global leader in the provision of quality, professional and practical fuel management, fuel analysis and consultancy programs for the marine, offshore and power generation industries.

	D@15C	V@50C	MCR%	ASH%	H2O%	S%	V	NA	AL+SI	TSP%
BALBOA, PANAMA										
AVERAGE	977.2	331.7	14.1	.05	.17	2.31	176	7	27	0.01
MAX	978.7	374	14.8	.06	.20	2.64	243	9		0.01
CEUTA, SPAIN										
AVERAGE	973.5	258	10.2	.03	.30	2.89	112	37	55	0.02
MAX	978.1	341	11.7	.04	.40	2.97	134	47		0.03
CRISTOBAL, PANAMA										
AVERAGE	979.5	231	12.0	.03	1.16	2.33	184	18	15	0.02
MAX	984.3	264	12.7	.05	2.12	2.44	210	28		0.02
DURBAN, SOUTH AFRICA										
AVERAGE	983.3	170.6	15.5	.04	.05	3.36	156	15	27	0.05
MAX	989.8	192	17.9	.05	.05	3.46	208	22		0.05
FUJAIRAH, UAE										
AVERAGE	969	343.8	15.1	.04	.22	3.16	126	31	6	0.02
MAX	983.9	464.6	19.9	.20	.60	3.8	170	54		0.07
GENOVA, ITALY										
AVERAGE	989.5	271	10.4	.03	.18	3.51	92	18	48	0.02
MAX	989.6	333	12.1	.03	.25	4.53	122	34		0.02
GIBRALTAR, SPAIN										
AVERAGE	983.8	307.9	14.1	.03	.12	3.39	172	27	23	0.02
MAX	989	371	16.7	.06	.15	3.93	236	54		0.05
GOTHENBURG, SWEDEN										
AVERAGE	986.9	358.6	15.8	.03	.12	2.38	163	18	22	0.03
MAX	989.9	385	17.2	.04	.70	3.23	214	31		0.04
HOUSTON, TX										
AVERAGE	985.6	203.4	14.6	.04	.09	3.05	116	9	19	0.02
MAX	994	340.5	17.9	.09	.20	4.17	235	21		0.04
LISBON, PORTUGAL										
AVERAGE	987.8	312.5	13.1	.03	.10	3.45	183	7	21	0.01
MAX	996.4	414	13.8	.04	.15	3.45	208	7		0.01
LOS ANGELES, CA										
AVERAGE	985.4	272.1	10.0	.04	.30	1.86	96	12	27	0.03
MAX	996.6	378.4	13.9	.08	1.00	2.88	274	24		0.1
MOIN, COSTA RICA										
AVERAGE	981.1	370	14.0	.05	.11	2.51	135	10	31	0.01
MAX	989.5	379	16.3	.06	.20	2.97	161	13		0.02
MONTREAL, CANADA										
AVERAGE	986.4	319.8	16.3	.03	.06	1.61	58	5	36	0.04
MAX	991	373.8	18.2	.04	.10	2.14	75	13		0.09
NEW ORLEANS, LA										
AVERAGE	988.6	204.5	14.4	.03	.07	3.94	110	15	17	0.03
MAX	990.1	239.4	16.1	.04	.10	4.13	110	19		0.05
NEW YORK, NY										
AVERAGE	980.2	234.5	11.6	.06	.52	2.68	194	15	18	0.05
MAX	991	359.1	19.2	.09	.90	3.37	291	25		0.16
NORFOLK, VA										
AVERAGE	988.2	205.6	10.5	.19	.38	2.87	226	9	19	0.03
MAX	990.9	268.7	11.7	.52	.40	3.35	298	18		0.04
PIRAEUS, GREECE										
AVERAGE	966.8	339.6	10.8	.02	.05	2.74	130	23	22	0.01
MAX	989.5	389	18.1	.04	.05	3.9	168	80		0.04
PUERTO LA CRUZ, VENEZUELA										
AVERAGE	965.2	299.3	10.8	.04	.07	1.96	132	7	32	0.01
MAX	971	405	11.4	.04	.10	2.02	141	9		0.02
ROTTERDAM, NETHERLANDS										
AVERAGE	939.4	341.5	13.7	.03	.19	3.35	133	24	26	0.03
MAX	1009.5	474	18.5	.07	.80	4.47	302	69		0.05
SEATTLE, WA										
AVERAGE	984.2	374.4	13.4	.03	.13	1.73	55	14	15	0.02
MAX	994.8	712.2	17.1	.05	.20	2.23	71	25		0.03
SINGAPORE										
AVERAGE	983.2	337	14.6	.03	.53	3.46	65	10	29	0.03
MAX	988.3	405	17.9	.05	5.80	3.97	79	36		0.09
SUEZ, EGYPT										
AVERAGE	958.5	306.8	10.8	.03	.08	3.12	167	16	25	0.02
MAX	960	376	11.4	.05	.15	3.32	208	22		0.02
WILHELMSHAVEN, GERMANY										
AVERAGE	987.6	333	14.4	.05	.20	2.67	176	15	34	0.06
MAX	993	408	16.7	.07	.40	2.77	296	23		0.1

KEYCODE

@15c:Density at 15 degrees centigrade.
V@50c:Viscosity at 50 degrees centigrade.
MCR %:Microcarbon Residue %.
Ash %:Ash level in fuel.
H2O %:Percent water in fuel.

S%:Percent sulfur.
V:Vanadium in ppm.
NA:Sodium in ppm.
AL+SI:Combination of aluminum and silicon expressed as ppm.
TSP%:Percent total dissolved solids

Mobil-Brand Marine Lubricant Service Available

Mobil Corporation's affiliates will now offer marine lubricant service to shipping companies calling on ports located in the Dominican Republic, Curacao, Aruba and Bonaire. A full range of Mobil-brand marine lubricants is available in 11 ports in the Dominican Republic, as well as the ports of Willemstad and Bullenbaai in Curacao; Oranjestad in Aruba and Kralendijk in Bonaire.

GlobeOffshore Now Available From Globe Wireless

GlobeOffshore, the first fully integrated workboat management system, is now available from Globe Wireless. The system acts as a decision support tool helping to improve vessel utilization, streamline operational and strategic decisions and maximize vessel efficiency. Onboard, the GlobeOffshore log captures all types of information — cargo, operational, crew and passenger, and position. The data is then available to the vessel owner via the Internet. Operational and strategic managers can track their fleet and produce timely reports on vessel activities.

GL Area Manager Retires

Klaus Muller, area manager of Germanischer Lloyd (GL) for China and former head of the Hong Kong branch office, will be retiring effective November 30. Muller has been with GL since 1970.

Kaplan & Associates Enters Maritime Industry

Al Kaplan, formerly of Harbormaster Marine, announced the formation of Kaplan & Associates, Inc. — a marine propulsion parts and products manufacturer/supplier. Propulsion parts, including gear sets, prop shafts and seal kits are available as well as new and used propulsion units.

Keppel Elects New Chair

Keppel Corp. Limited and Keppel TatLee Bank Limited have appointed Lim Chee Onn as executive chairman upon the retirement of Sim Kee Boon, effective January 1, 2000. Boon will continue to act as senior advisor to the Keppel Group. Onn holds a BSc in Naval Architecture from the University of Glasgow and a Masters in Public Administration from Harvard University.

IMA

FLOATING PRODUCTION SYSTEMS

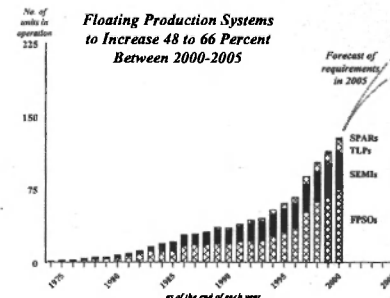
a series of business reports to be published in August 1999, December 1999 and April 2000

\$1,400 for the report series

Rapidly growing business sector — 107 floating production units are currently in operation, 21 are on order — and we see no slowdown of growth in this sector. Our forecast calls for the inventory of operating units to grow 48 to 66 percent between 2000 and 2005, requiring orders for 62 to 84 FPSOs, production semis, TLPs or spars over the next five years.

IMA's coverage — We closely follow this market sector and issue a series of business reports that

- ◆ summarize floating production systems in operation, on order and planned
- ◆ assess underlying business conditions driving future activity in floating production
- ◆ provide details for floating production systems planned, on order and recently delivered
- ◆ identify recent developments impacting floater technology and companies



Contents of the August 1999 Report

I. INVENTORY OF CURRENT AND PLANNED FLOATING PRODUCTION SYSTEMS

1. Floating Production Systems Now in Operation
2. Systems Installed Since September 1996
3. Floating Systems Now on Order
4. Where Floaters are Currently Being Built or Converted
5. Floating Production Systems Planned or Being Studied

II. ANALYSIS OF UNDERLYING MARKET DRIVERS FOR OFFSHORE ACTIVITY

1. World Economy Recovering as Asia Turmoil Recedes
2. Growth in Crude Demand Rebounding
3. Major Producers Adhering to Agreed Cutbacks
4. Excess Stocks to be Drawn Down in the 2nd Half
5. Spot Oil Prices Have Returned to Fall 1997 Levels
6. Recent Developments Are Beginning to Impact E&D
7. What Are the Threats to the Current Recovery?
8. Is The Rise in the Price of Crude Sustainable?

III. FORECAST OF ORDERS FOR FLOATING PRODUCTION SYSTEMS THROUGH 2005

1. FPSO Vessels
2. Production Semis
3. Tension Leg Platforms
4. Production Spars

IV. ASSESSMENT OF RECENT DEVELOPMENTS

1. Projects in the Planning or Design Stage
2. Floating Systems on Order
3. Systems Recently Installed
4. Equipment Acquisitions and Contract Changes

V. TECHNOLOGY AND COMPANIES

1. DeepStar
2. Heated Pipelines
3. Buoy Based Production Unit
4. M&A Continues in the Offshore Sector

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People & Company News

TransCoastal Appoints Wilson To Its Board

TransCoastal Marine Services elected **Richard O. Wilson** to its board of directors on September 8. Wilson, who currently is a director of Callon Petroleum, has more than 40 years of manage-

ment and executive experience in the marine construction industry.

Astoria Metal Preps Site For Commercial Yard

Astoria Metal Corp. (AMC) has moved its office to the former Long

Beach Naval Shipyard, and has launched the site's conversion to a commercial shipyard.

Planning to construct utility barges for the supply of electric power to countries with electric power shortages, the company will also solicit ship repair work from oil tanker companies, cruise ship

lines and container lines calling at the ports of Long Beach and Los Angeles.

With one of the biggest drydocks on the west coast, the company estimates that it expects to employ about 500 workers.

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Jergens Hoist Rings Are Environmentally Safe

Jergens, Inc. has developed Envirolox — an environmentally-safe coating for its lifting products. The new protective plating eliminates the potential environmental liabilities of cadmium plating, while providing superior protection from harsh environments. Offering proven resistance to extreme conditions such as salt and spray, the plating is available on center pull and side pull style Jergens hoist rings.

Jabsco Purchases Flojet Corporation



Jabsco, Rule and Flojet products

Jabsco's parent company, ITT Industries, has acquired the privately held Flojet Corp. headquartered in California. With a European sales office in Milton Keynes, England, Flojet is a global pump manufacturer that produces a selection of specialist pumping equipment, including a complete range for marine applications. Founded in 1975, the company has a current annual turnover of about \$50 million.

Seen as offering significant growth opportunities in worldwide niche markets, this acquisition follows last year's purchase of Rule Industries.

American Commercial Barge Elects Fleet Manager

Gary C. Ruff has joined American Commercial Barge Line LLC as fleet manager in the planning center. Ruff, who previously served as



logistics manager for Holman Cement, holds a bachelor's degree from Lindenwood College, St. Charles, Miss.

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96

Maritime Reporter/Engineering News

Ports Investing Record Amount Per Year

U.S. public port authorities will invest more than \$9 billion in the next five years to improve and expand their facilities, according to deputy maritime administrator **John Graykowski**, who spoke at the American Association of Port Authorities' (AAPA) 88th annual convention.

Last year, ports invested about \$1.5 billion, almost equaling the record set in 1997, including \$154 million for general cargo. During the five-year period between 1999 and 2003, ports expect to spend \$9.1 billion, compared to \$7.7 billion between 1998 and 2002.

On Tuesday, the Association recognized two long-time port executives - **James J. O'Brien** and **Frank G. Martin, Jr.**, who received the ImPORTant Service Award and the Distinguished Service Award, respectively.

Bray Named AAPA Chair

J. Robert Bray, executive director of the Virginia Port Authority, was installed as AAPA chairman of the board during the Association's Annual Membership Meeting in N.Y. Bray, who has been executive director of the Virginia Port Authority since 1978, was elected chairman of the board-elect of the AAPA during the Association's Spring Conference last March in Washington, D.C. He succeeds **H. Thomas Kornegay**, executive director of the Port of Houston Authority.

Cole Hersee Offers New "FlatPad" keyless Ignition

Cole Hersee Co, a maker of electrical and electronic switches for the marine industry since 1924, introduced the FlatPad, a multiplexed controller capable of sending multiple, electronically coded signals through a slender wire to turn on engines, motors, lights and navigation equipment. The FlatPad is fully customizable in size, shape, color and functionality.

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Coles Joins As MD

Globe Wireless, provider of communications solutions to the maritime community has appointed **Frank Coles** as managing director. Coles, who is also a master mariner previously served as vice president, business development and information



technology with Litton Marine Systems.

MariTEL Appoints VP

MariTEL Marine Communications System has elected **Steve Skalski** as vice president of operations, focusing on construction of the MariNet — the marine local loop. Before assuming his

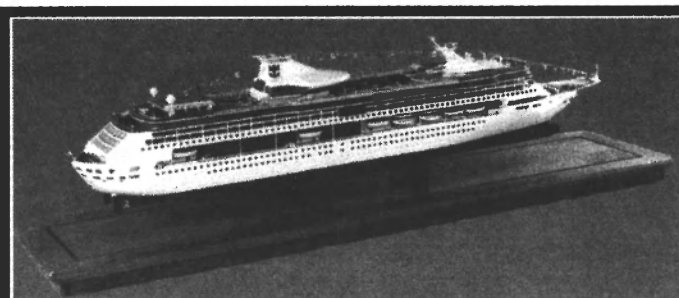
current position, Skalski served as vice president eastern division with EchoStar in Atlanta.

SUNY Maritime Restructures Curriculum

The president of SUNY Maritime College stated that the institution is

redesigning its curriculum and refocusing its mission to meet the needs of students and the maritime industry as we move toward the millennium.

In a speech given during the school's recent homecoming ceremonies, Rear Admiral **David C. Brown** detailed a restructuring plan that would gradually transform the college from a focus on



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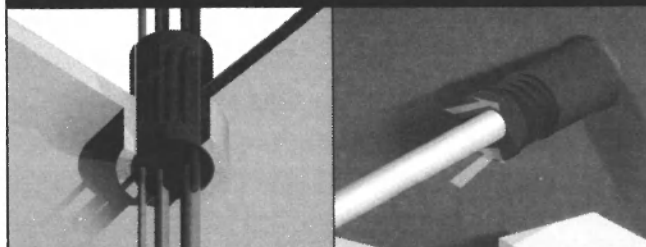
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ship operation to the business of shipping. Developed by both the college and SUNY officials, the redesign plan includes a refocusing of the school's primary mission to provide an improved business orientation, among other things.

Safford Promoted To Exec. VP

Blue & Gold Fleet L.P. has promoted **Taylor Safford** from vice president of

finance and administration to executive vice president of finance administration.

In his newly appointed position, Safford will be responsible for all accounting and finance, computer systems, personnel, box office operations and administration for the company.

Coastal Appoints New VPs

Coastal Towing has elected **J. Pat**

Collins, vice president of marketing and business development; and **E. Clay Griffin, Jr.** as vice president of sales.

Terminal Loads First Of Cutter Patrol Boats

Using the only shoreside heavy-lift crane in the port complex, American Model 325 Traveling Gantry Revolver at Pacific Coast's Recycling's Rio Doce

Pasha Terminal loaded the first of several U.S. Coast Guard Cutter Patrol Boats Measuring 82 ft. (25 m), the cutters will be given by the U.S. to the Argentine government.

Up until two months ago, former cutter Point Hobart had been on active duty before its recent overhaul and cradling at San Pedro Boat Works. Subsequent to this, RDP rigged special slings, enabling the 68 ton boat to be launched into the water for towing to Long Beach by Vessel Assist.

MMA Elects New Chairman

William E. Haggett was appointed chairman of the Maine Maritime Academy.

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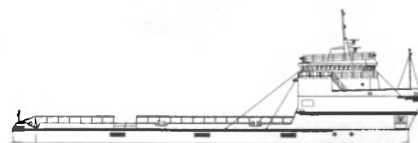
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World's Biggest Cruise Liner Sails To U.S.

The world's biggest cruise liner, the 1,035-ft. (311-m) Voyager of the Seas, set sail in late November from its birthplace at Kvaerner Masa-Yards in Finland to its permanent home in the U.S.

The \$500 million vessel is the first of three sister ships ordered by cruise operator Royal Caribbean from Masa-Yards in the western Finland city of Turku.

The ship's maiden commercial cruise is scheduled for November 21.

The 137,000-ton floating hotel is designed to carry approximately 3,000 passengers and 1,800 crew in over 2,000 cabins spread over 15 decks.

It features a 328 ft. (100-m) long high street promenade, hosting cafes, restaurants, shops and a casino with 400 slot machines.

Special attractions include a three-story theatre with 1,350 seats, which imitates Milan's renowned La Scala, an ice-skating rink and a 32 ft. (10-m) climbing wall situated on the back of the ship's funnel.

Royal Caribbean has positioned the huge ship as the largest new player in a booming cruise ship market. It will be followed by two sister vessels, Explorer of the Seas and Adventure of the Seas, that are due for delivery in autumn 2000 and spring 2002.

NKK Develops High-Performance Steel Pipe

NKK Corp. of Japan has formulated a new type of steel pipe containing one percent chromium, a property that reportedly offers exceptional corrosion and wear resistance and weldability for use as cargo oil pipes on oil tankers.

According to an NKK spokesman, advantages of the new product called NK-Marine Cop include: easy on-site welding without pre-heat treatment resulting from low carbon base steel, lowered construction and maintenance costs, and availability from small diameter seamless to large diameter welded pipes.

Circle 8 on Reader Service Card

my Board of Trustees by a unanimous vote of the college's Board of Trustees at a recent meeting.

Haggett, who is chairman and CEO of Naturally Potatoes, Mars Hill, Maine, is the former president of Saint John Shipbuilding, and the past chairman and CEO of Bath Iron Works.

A graduate of Colby College, Haggett also completed the Harvard Graduate

School of Administration Program for Management Development and is a member of the American Bureau of Shipping.

Schat-Harding Develops Simple Safety System

Safety specialist Schat-Harding has developed a simple idea to improve the safety of conventional lifeboat and davit

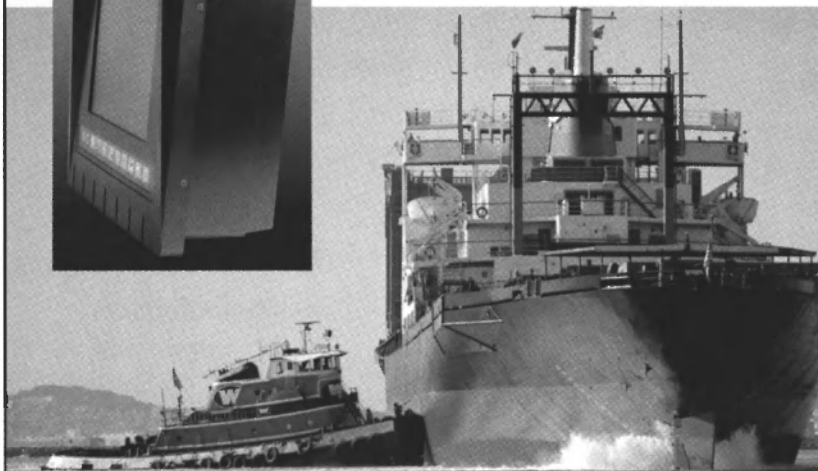
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People & Company News

installations. PROD (Preferred Orientation and Displacement) has been tested in practice by a number of operators of fixed installations, and is now being developed for FPSOs.

PROD, which gets conventional lifeboats clear of the unit quickly and safely, includes a long flexible boom, which is mounted at the davit location, pointing at right angles to the rig side. A

tag line runs from the end of the boom to the bow of the boat and when launched, the tag line tightens and the boom dips down like a giant fishing rod. This action automatically charges hydraulic

accumulators mounted in the system control cabinet. As the boat hits the sea and is freed from the falls, the accumulators take over and begin to raise the boom. As they do so, the tension applied to the tag line pulls the boat clear of the rig automatically. The tag line which is attached to a unique hook assembly at the forward boat hook automatically releases as the bow of the boat passes under the end of the boom, at which time the boat is clear of the rig and moving in the right direction.



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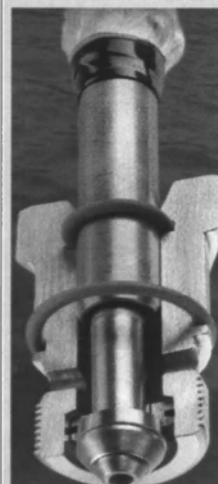
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MAN B&W Introduces Double Walled Pipes



As part of an ongoing program for modernizing spare parts for its diesel engines, MAN B&W has presented its newest — the fully interchangeable Double Walled High Pressure Pipes.

Designed for the fuel and hydraulic systems on the 50 - 90 and 98MC engines, the pipes increase the inherent safety with respect to metal fatigue. The braided steel hose surrounding the pipes contains insulating material and has the exclusive purpose of guarding the engine room staff from hot pipe surfaces.

In addition to their enhanced safety features, the new pipes are easier to handle and install, and are less prone to damage.

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Marine Exchange Completes Facility Expansion

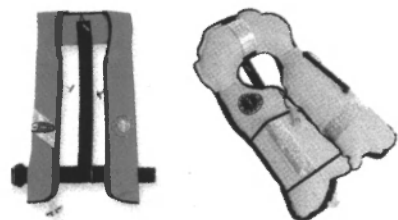
After establishing a budget of \$865,000, holding public hearings and completing an environmental assessment, ground was broken in October 1998 for what would eventually develop into the new Marine Exchange building expansion.

Both the architect and building inspectors who were working on the project signed off during the last week of July — signifying the project's completion.

Measuring more than 6,000 sq. ft. (1,828 sq. m), the new building is sig-

nificantly larger than its predecessor, which measured 2,800 sq. ft. (853 sq. m) and was designed for 10 employees. The new facility houses 21 full-time employees, nine part-time employees and eight Coast Guard staff.

Mustang Presents Inflatable PFD



Mustang Survival launched the latest addition to the Air Force with its line of inflatable PFD's - a USCG approved inflation device, model MD3001.

In comparison with all inflatable PFD's in the AirForce line, MD3001 has 35 lbs. of buoyancy - allowing the capability to self-right a person in a matter of seconds. Available to the public through marine retailers this winter, the product also includes a safety whistle and SOLAS reflective tape.

Circle 10 on Reader Service Card

GE Provides Samsung With Gas Turbines

GE Marine Engines has agreed with Samsung Aerospace Industries for the provision of two LM2500 aeroderivative gas turbines (each 30,000-hp) to be used by the Republic of Korea Navy for its next generation KDX-Type II destroyer. Featuring a CODOG (combined diesel or gas turbine) configuration, KDX-II is being constructed by Daewoo at Hyundai Shipyards with Samsung as the gas turbine contractor.

Smit Completes Oil Removal



Smit International Singapore has finished the oil removal from MV Cordiality, a bulk carrier, which sank off Pulmoddai, North of Trin-

comalie Sri Lanka in September 1994. With work commencing on August 6, the oil removal process was completed in four days by a local partner, Master Divers, who, along with the salvors, pumped out the oil from the wreck with a skimmer and then stored the oil in tanks of a supply vessel.

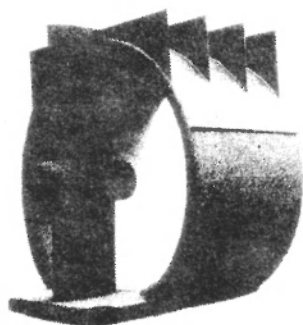
All salvage activities, which

were performed during the day, included control and clean up of pollutants, as well as the physical removal of the vessel.

After inspection by the Sri Lankan Naval Unit, the vessel was crossed off as an environmental threat to the waters off Pulmoddai due to its oil free status.

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People & Company News

Rogaski Joins Maritime Design

Bob Rogaski has joined Jacksonville, Fla.-based Maritime Design as director of marketing/sales. A graduate of the U.S. Merchant Marine Academy and Loyola University, Rogaski formerly served as vice president, marketing with Ashland Chemical Co., Drew Marine Division.

Baystate Now Known As Cadkey

Baystate Technologies, developer of mechanical PC-CAD solutions has decided to conduct business under

a new name - Cadkey Corporation, effective immediately. The privately held Baystate acquired the Cadkey mechanical CAD (Computer-Aided Design) product line in 1996 with its name branding initiated to identify the Company's trading name with its renowned Cadkey products.

Circle 12 on Reader Service Card

R&B Falcon Completes Project Financing

R&B Falcon Corporation announced that Deepwater Drilling II, owned by affiliates of R&B Falcon and Conoco, has concluded a \$270 million project financ-

ing. All proceeds from the project will be used to finance the construction cost of the ultra deepwater drillship, Deepwater Frontier, delivered from Samsung Shipyard in South Korea last March. The 10,000-ft. (3,048 m) water depth capable Frontier has already drilled one well in New Zealand and is currently mobilizing to another location offshore West Africa.

Matson Navigator's Fleet Is ISM Certified

Matson Navigation Company's containership has been officially certified under the provisions of the International Safety Management (ISM) Code. The Code, which is internationally mandated for the safe operation of vessels and the prevention of pollution to the ocean environment, involves a two-part process. Companies are required to qualify for a Document of Compliance (DOC) for their shoreside headquarters' office as well as Safety Management Certificates (SMS) for each active vessel.

Inmarsat Unveils Mobile ISDN Service

Inmarsat presented its new Mobile ISDN service at IBC, the International Broadcasting Conference in Amsterdam from September 10-14.

This new service, developed with valuable input from the New Media Committee of the World Broadcasting Union, will support a range of news gathering tools at a communications rate of 64 Kpbs, while using portable satellite terminals the size of a notebook computer. Weighing 9 lbs, these terminals are a quarter of the size of the equipment that is used to relay video via Inmarsat's global satellite network.

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Maritime Reporter/Engineering News

Golden Ocean Reaches Agreement With Bond Holders

After one year of negotiations between Golden Ocean Group, its financial advisor Chase Securities and Holders of its Senior Notes, chairman **Fred Cheng** and president **Robert Knutzen** announced that an agreement was reached on securing the company's financial future. The negotiations with Bond holders have resulted in a proposed plan of reorganization of Golden Ocean Group bond debt, which extends the life of the bonds and reduces the face value. Bond holders will also be granted 90 percent of the significant economic equity with Cheng and the management team retaining voting control in the restructured company. The management team, led by Cheng and Knutzen, continues to manage the company on a day-to-day basis. A new corporate board was also established.

Global Industries Names New President And COO

Global Industries has elected **Edgar G. Hotard** as president and COO, effective September 20. Hotard, who previously served as president and COO of Praxair until his retirement last year, will continue to be a member of the Board of Directors of Global in addition to his current position. **Robert L. Patrick**, who is currently serving as West Africa area manager, will assume responsibilities for Global's existing international operations, replacing **Clay Etheridge**.



3M Simplifies Effective Marine Firestopping



3M has introduced a new fire protection material for cable penetrations in shipboard bulkheads and decks that is designed to simplify handling and reduce installation labor - 3M Marine Fire Wrap. Maintaining the integrity of fire-rated structures for up to an A60 (IMO) and H60 (UL) rating, this new cable firestop material has also been classified by the U.S. Coast Guard for its watertight reliability.

The flexible, graphite-based intumescent product expands up to 25 times in thickness under the heat of fire, allow-

ing the wrap to effectively fill in the voids around and between cable bundles. When expanded, the fire wrap forms an effective thermal insulator and with an approved sealant, closes openings to hinder the spread of deadly smoke.

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Argosy Cruises, Consolidated Restaurants Partner

Argosy Cruises and Consolidated Restaurants have joined together in an equity partnership in the development of Argosy Cruises' new dinner cruise ship concept. The ship, which is estimated to

cost approximately \$8 million, will be owned and operated by both companies.

Scheduled for a May 2000 launching, the vessel is modeled after the Sydney 2000 vessel in Australia, and is the first of its kind in the U.S. It measures 180 ft. (54.8 m) and features many amenities and a seating capacity of 600.

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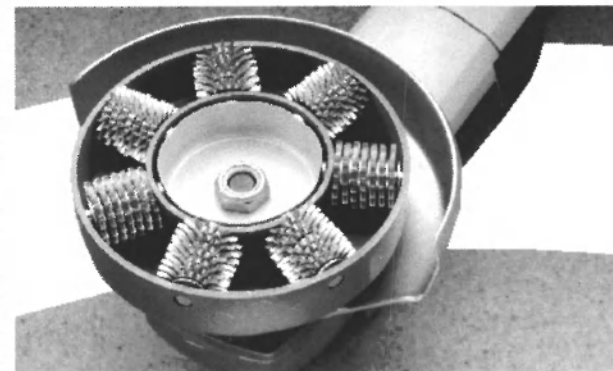
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TAI CHONG CHEANG STEAMSHIP (TCC)	HONG KONG	DAEWOO	BULK CARRIER	1	—	173,000	2001	35
FORMOSA PLASTICS	TAIWAN	ISHIKAWAJIMA HARIMA H.I. (IHI)	BULK CARRIER	2	—	170,000	2002	69.5
K-LINE/CHUBU ELECTRIC POWER	JAPAN	IMABARI SHIPBUILDING	BULK CARRIER	1	—	99,000	2002	24
ALCYON SHIPBROKING & TRADING	GREECE	NAMURA DOCK	BULK CARRIER	1	—	74,000	2001	23
ANGELAKOS	GREECE	NAMURA DOCK	BULK CARRIER	4	—	74,000	2001	92
GREEK INTEREST	GREECE	NAMURA DOCK	BULK CARRIER	1	—	74,000	2001	—
NAVIOS	US	NAMURA ZOSENSHO	BULK CARRIER	1	—	74,000	2001	21.3
RESISTIS	—	DAEWOO	BULK CARRIER	1	—	74,000	2001	22.1
GRAND SEATRADE	HONG KONG	SUMITOMO	BULK CARRIER	2	—	72,000	2001	42
CLIPPER GROUP/VAN OMMEREN	DENMARK	JIANGYANG	BULK CARRIER	2	—	52,000	2001/2002	35.6
NOMIKOS (LONDON)	UK	JIANGYANG	BULK CARRIER	2	—	51,000	2001	36
SPAR SHIPPING	GERMANY	JIANGYANG	BULK CARRIER	2	—	51,000	2001/2002	35.4
TORVALD KLAVENESS	NORWAY	OSHIMA SHIPBUILDING	BULK CARRIER	4	—	50,900	2002	—
TAIWANESE INTERESTS	TAIWAN	OSHIMA SHIPBUILDING	BULK CARRIER	1	—	50,800	2001	—
SPAR SHIPPING	NORWAY	NANTONG COSCO KHI	BULK CARRIER	1	—	47,100	2000	25
MARUBENI CORP	JAPAN	TSUNEISHI	BULK CARRIER	2	—	46,719	2001	—
PACIFIC BASIN BULK SHIPPING	HONG KONG	HAKODATE DOCK	BULK CARRIER	2	—	32,000	04/2001	30
DIAMOND CAMELLIA SA	JAPAN	HAKODATE DOCK	BULK CARRIER	2	—	31,700	2000	30.4
PACIFIC BASIN BULK SHIPPING	HONG KONG	KANDA SHIPBUILDING CO.	BULK CARRIER	3	—	28,000	2001	44.4
UNKNOWN	UNKNOWN	IMABARI SHIPBUILDING	BULK CARRIER	2	—	28,000	2001	33
DIANA SHIPPING	GREECE	WUHU SHIPYARD	BULK CARRIER	2	—	24,400	2001	—
B&N NORDSJOFRAKT	SWEDEN	MAWEI	BULK CARRIER	1	312	—	2002	—
KLAVENESS	NORWAY	NIPPON KKK	BULK CARRIER ORE ST.	2	—	172,900	2000	71
K-LINE	JAPAN	NIPPON KKK	BULK CARRIER ORE ST.	1	—	170,000	2001	36
EMIRATES TRADING	UAE	HITACHI ZOSEN	BULK CARRIER ORE ST.	2	—	75,000	2001	46
MALAYSIAN INTERESTS	MALAYSIA	HONG LEONG-LUERSSEN	BUOY TENDER	1	—	350	2000	—
US INTERESTS	US	ALABAMA SHIPYARD	CASINO SHIP	1	—	—	2000	—
MONTANARI GROUP	ITALY	HYUNDAI MIPO	CHEMICAL TANKER	1	—	35,000	2001	24
GERMAN TANKER SHIPPING	GERMANY	J.J. SIETAS	CHEMICAL TANKER	2	—	3,500	2000	—
MITSUI OSK LINE	JAPAN	IMABARI SHIPBUILDING	CONTAINER	3	5,500	70,000	2001	150
DANAOS SHIPPING/NOL	GREECE	SAMSUNG	CONTAINER	2	5,500	69,000	2001	100
CSAV/ PETER DOHLE	CHILE / GERMANY	SZCZECIN SHIPYARD	CONTAINER	5	3,100	42,500	2001/2002	200
RUDOLF SCHONING	GERMANY	GDYNIA	CONTAINER	2	1,130	40,000	2000	34
KOREA MARINE TRANSPORT CO.	KOREA	SAMSUNG	CONTAINER	2	1,585	21,200	2001	52
VROON	NETHERLANDS	HANJIN	CONTAINER	4	1,600	19,450	2000	88
ACOMARIT	GREECE	MAWEI	CONTAINER	3	694	—	2001	—
CONTI REEDEREI	GERMANY	HANJIN	CONTAINER	2	5,600	—	1999	120
COSCO	CHINA	KAWASAKI H.I.	CONTAINER	5	5,250	—	2001	330
COSCO	CHINA	NANTONG COSCO KHI	CONTAINER	2	5,250	—	2001	132
GERMAN INTERESTS	GERMANY	KROEGERWERF	CONTAINER	1	366	—	2000	—
PETER DOHLE SCHIFFAHRTS	GERMANY	SZCZECIN SHIPYARD	CONTAINER	1	1,730	—	2000	—
RADISSON SEVEN SEAS	US	CANTIERI NAVALE VISENTINI	CRUISE SHIP	1	—	—	2002	190
NAVIGIA	NETHERLANDS	TILLE SCHEEPSBOUW	GENERAL CARGO	2	—	3,820	1999/2000	19.5
MARTINEX/WESSEL GROUP	GERMANY	YANTAR SHIPYARD	GENERAL CARGO	6	—	3,800	—	34.5
WARRINGS HARLE	UNKNOWN	SELAH MAK SANAYII	GENERAL CARGO	1	12	—	1999	—
BELUGA SHIPPING	CHINA	JIANGDONG CHANGJIANG	GENERAL CARGO/CONT.	2	512	5,350	2001	18
SCHULTE GROUP	GERMANY	JIANGNAN	LPG	2	—	—	2001	43
DODEKANISSOS	GREECE	BATSERVICE INDUSTRIER	MULTI-HULL PASS/FERRY	1	—	—	2000	—
TOM WORDEN	GERMANY	JIANGDONG CHANGJIANG	MULTI-PURPOSE	2	—	4,500	2000	—
TT- LINE	GERMANY	SSW FAHR UND SPEZIALSCHIFFBAU	PASS/FERRY	2	—	—	—	—
UNKNOWN	UNKNOWN	FBM MARINE	PASS/FERRY CATAMARAN	1	—	—	2000	—
UNKNOWN	UNKNOWN	SOVIKNES VAERFT	PLATFORM SUPPLY VESSEL	1	—	—	1999	—
IMC GROUP	SINGAPORE	DALIAN SHIPYARD	PRODUCTS TANKER	2	—	45,000	2001/2002	58
OVERSEAS MARITIME CARRIERS	SWITZERLAND	GUANGZHOU	PRODUCTS TANKER	2	—	38,000	2001	48
UNITED EUROPEAN CAR CARRIERS	NORWAY	TSUNEISHI	PURE CAR CARRIER	3	—	6,670	2000	38
B&N NORDSJOFRAKT	SWEDEN	GDANSK	ROLO	2	—	15,800	2001	30
WILHELMSSEN LINES	NORWAY	DAEWOO	RORO	1	2,362	38,300	02/2001	75
TORCH	US	DAKOTA CREEK INDUSTRIES	SUPPORT VESSEL	1	—	—	2000	—
OSG	US	HYUNDAI HEAVY INDUSTRIES (HHI)	TANKER	2	—	307,800	2001/2002	150
GREEK INTEREST	GREECE	KOYO DOCK	TANKER	2	—	60,000	2001	—
MORMUGAO PORT TRUST	INDIA	HINDUSTAN SHIPYARD	TUG	2	—	170	2001	—
NEW MANGALORE	INDIA	HINDUSTAN SHIPYARD	TUG	2	—	170	2001	—

Gulf of Mexico

(Continued from page 44)

According to **Mike Williams**, director of Ingalls' Offshore Programs Business Development, Ingalls is well positioned to handle not only the technical demands but also the various cycles of the offshore market. Since most of Ingalls' revenue is generated on the naval vessel side, the shipyard has an enviable continuity of workforce and technical expertise. Also, the company's accessibility to the Gulf — just 11 miles from the deepwater GOM with no air draft restrictions — gives the yard the capability to handle the largest projects.

Whereas Ingalls gets the majority of its business from the government, Atlantic Marine Holding Co.'s two yards in Mobile — Alabama Shipyard (new construction) and Atlantic Marine - Mobile (repair and conversion — are wholly dependent on the commercial market for their success. **E.C. "Buddy" McCormick**, president of Atlantic Marine - Mobile, attributes this commercial-only vision as a major plank in ensuring his customer's satisfaction, as it allows the ship repair and conversion professionals maximum flexibility in deploying the company's vast resources. "Our customers don't like to come into a shipyard," they'd rather their ships be operating and making money. "So our focus is on turnaround time...we get them in and get them out."

While he admits that it might have been easy to be seduced by government work in the face of recent downturns in offshore and marine markets, he staunchly believes — in part from traveling the globe and visiting repair and conversion colleagues — that government and commercial work don't mix.

McCormick says Atlantic Marine-Mobile is a take-charge shipyard, and while the company is not always the low bidder, it always provides the best value.

The company's president lists people, facilities and culture as the top reasons Atlantic Marine-Mobile has enjoyed great success since taking over the old World War II facility in 1989, and his assessment is more accurate than trite upon visiting the facilities.

Alabama Shipyard, the newbuild facility of Atlantic Marine Holding in Mobile, is currently involved in building the first of what it hopes is many OPA '90-compliant ATB barges. The unit — which was designed by the shipyard in a variety of sizes for a variety of purposes — is a 460 ft. (140 m), 135,000 barrel capacity notched barge for Reinauer Transportation, scheduled to enter service in December 1999. The unit will mate with a new 124-ft. (37.8 m) tug,

Nicole Leigh Reinauer, which is being built at the Atlantic Marine Jacksonville facility.

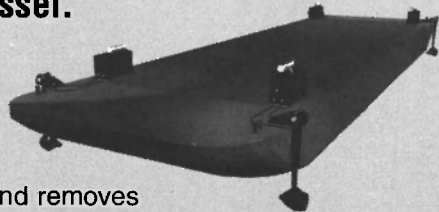
Bollinger Shipyard, in Lockport, La., has been steadily expanding and increasing its capabilities, seemingly making giant strides forward in non-ideal business conditions. The company

has just finished implementing an advanced software solution system which effectively has tied all divisions together in an information sharing arrangement that will create new levels of efficiency and quality management. The company is unique in that it runs a healthy share of commercial and mili-

tary business through its facilities, as **Scott Theriot**, Executive Vice President of new construction, estimates that 35 percent of the company's newbuilding business is military related. (Overall, the company has a fairly even 50/50 repair/new construction split.) While he admits that the process of becoming a

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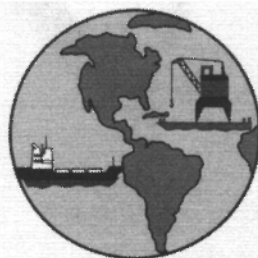


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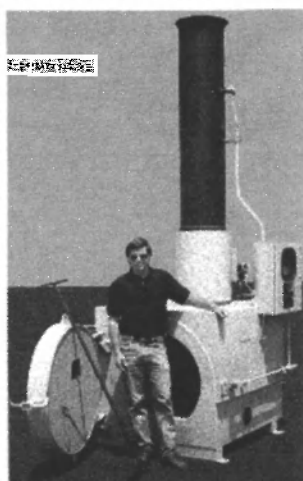
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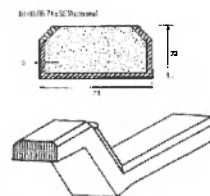
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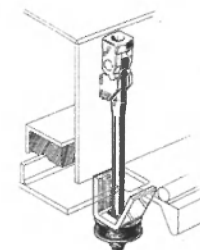
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other sizes

Various end & corner pcs.

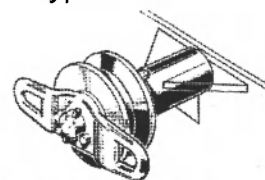


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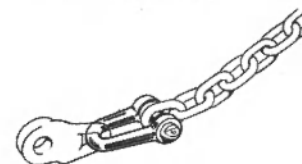
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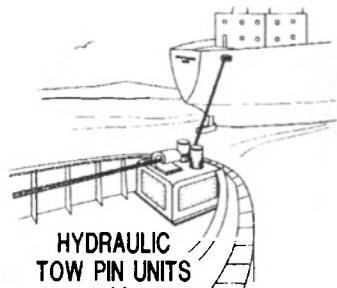
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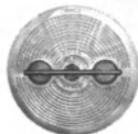
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Circle 369 on Reader Service Card

Gulf of Mexico

good military and commercial yard entails a lot of trial and error, Theriot said.

A significant military contract has been for the construction of the Cyclone class patrol coastal ship. Bollinger recently launched USS Tornado. While it was the 14th of the Cyclone Class built by Bollinger, under a sole-source contract with the Navy, the vessel is the first to include design modifications, equipment and armament upgrades as part of the Navy's Pre-Planned Product Improvement Program.

Boasting a new, fully integrated bridge command and control system to increase the vessel's capabilities,

Tornado is equipped with a satellite navigation system forward looking infrared and surface radar with collision avoidance capabilities.

The vessel is based on the Vosper Thornycroft Ramadan class design and modified to meet Navy requirements. One specific change is the extension of the stern, which includes a ramp for the launch and recovery, while underway, of naval special warfare boats. As a result of this process, Tornado increased in length to 179 ft.(54.5 m) from the 170 ft. (51.8 m) earlier models.

As a further validation of its prowess on the military side of the business, Bollinger at press time announced the receipt of a \$5.1 million contract to modify three Patrol Coast Ships (PC) for the U.S. Navy. The company has an option on a fourth vessel, which are of the Cyclone Class, which would bring the contract value to more than \$6.7 million.

On the commercial side, Bollinger is nearly complete with a unique project in the building of the 105-ft. (32 m) Vera Bisso, for E.N. Bisso & Son, Inc. The



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Karl Senner: Driving The Market

Death, taxes and ... Karl Senner Inc.?

In an industry and business environment that is constantly changing, Michael Senner of Karl Senner Inc. counts his company's steady presence — in good times and in bad — as one of the reasons customers tend to come and stay for the long term. Unlike diversified companies, which fall back to stronger markets when the marine market turns towards one of its notorious bad spells, Karl Senner Inc. "has all its eggs in one basket .. we don't come and go with market swings." This reliability, instilled as a guiding principle when his father started the company in 1972, has helped the company navigate particularly bad stretches, such as the oil patch bust in the early to mid 80s, a time when the company saw its revenue dive from \$12 million in 1982 to less than \$2 million in 1984.

Karl Senner, Inc. is a fixture in the Gulf of Mexico region for sure, yet it spans the country, with offices on the West Coast and on the East Coast. The company sells and services some of the industry's top-line propulsion systems, including Reintjes marine gearboxes, Rexroth marine controls; Berg Propulsion (CP propellers and bowthrusters) and ABB turbocharger services.

Senner reports that business has been "exceptionally good" over the past few years, and with the resurging oil price he's cautiously optimistic for 2000 and beyond. He notes that the company's growing service and supply capabilities, which currently accounts for about 10 to 15 percent of revenues — provides a nice fallback for when new construction business falls off.

Senner believes that the proliferation of deepwater offshore developments will continue to change the way in which companies like his operate.

"The average value of each contract is getting larger, as the sizes of crews, supplies and AHTS' continue to get bigger."

Circle 180 on Reader Service Card

el (which was featured in the October 1999 edition of *Maritime Reporter*), is built for dual applications, as it can serve as a ship assist vessel along the Mississippi river, but is also capable of performing offshore work.

New Dawning

Horizon Shipbuilding in Bayou La Batre, Ala. and Travis E. Short, its president and CEO, have roots in the DM maritime market dating back to Adson Shipbuilding, which operated until the first oil bust in the early 1980s, and Owen Short Marine, which split apart two years ago.

Horizon Shipbuilding — which has signed a contract for the construction of a 135 x 32 ft. (41.1 x 9.7 m) dinner cruise vessel for an unnamed client. Scheduled for a March 2000 delivery, construction of the vessel commenced at Horizon's Bayou LaBatre, Ala. facility. Designed by A.K. Suda Naval Architects and Marine Engineers, the vessel will be certified to U.S. Coast Guard Subchapter K regulations for vessels under 100-gt.

Twin Caterpillar 3408 diesel marine turbocharged engines will power the vessel with electrical power provided by two 105 kW and one 170 kW CAT pow-

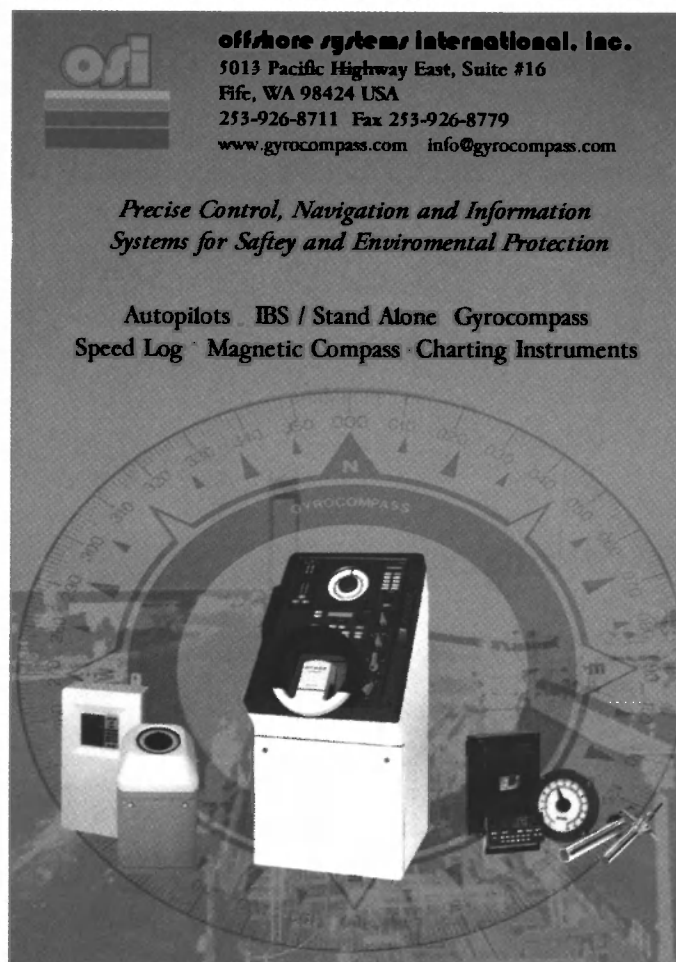
ered generators.

The company was also recently awarded a contract to construct a series of 30 ft. (9 m) fiberglass Improved Surface Tow Targets (ISTT) for the U.S. Naval Air Warfare Center, Weapons Division in Point Mugu, Calif.

According to Short, the total contract calls for the delivery of more than 30 units throughout the next two years.

FGI And Halter Merger Activities On Schedule

Friede Goldman International stated that its activities related to its pending merger with Halter Marine Group were progressing on schedule. The company has received commitments from a group of banks led by Wells Fargo and Bank One for a credit facility that will meet the financing needs of the combined company. Response from shareholders of both companies to the proposed merger has been positive based on proxies received through October 25. Transition teams have been meeting in an effort to assure an organized integration of the operations and management of the two companies.

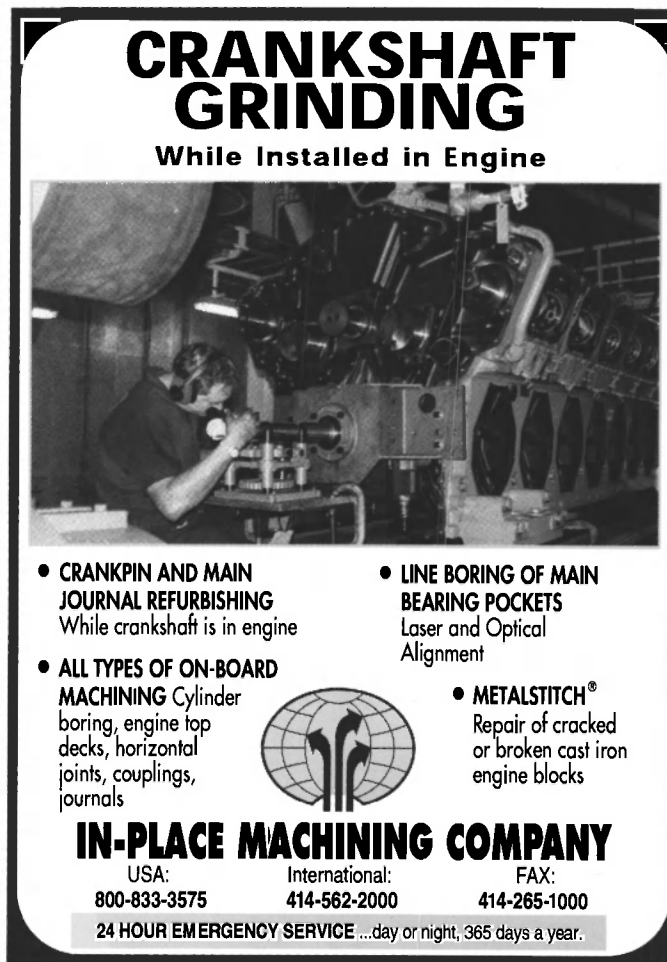


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Keppel FELS Sends Off Galaxy III

Keppel FELS Limited (Keppel FELS), a subsidiary of Keppel FELS Energy & Infrastructure, has delivered Galaxy III to Santa Fe International Corp. The rig's total value is estimated at \$179



million. Christened Singapore on September 18, 1999, the rig will then depart for the North Sea to work in the U.K.'s North Sea sector for BP Amoco. The rig's drilling equipment was furnished by Santa Fe, while Keppel provided the engineering and construction.

Galaxy's drilling package can be set off to an adjacent fixed platform, enabling the rig to working Tender Assist mode and to access a broader range of drilling positions. The rig also houses a full jacking system developed by Keppel's wholly-owned research & development subsidiary of Offshore Technology Development. Surveyed and classed by the American Bureau of Shipping (ABS) with notation for Maltese Cross Class 100A1, Galaxy III is designed to operate under detrimental environments following the U.K.'s Health and Safety Requirements.

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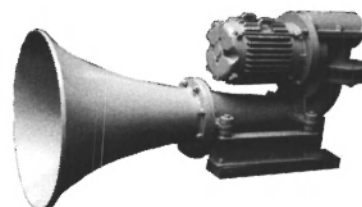
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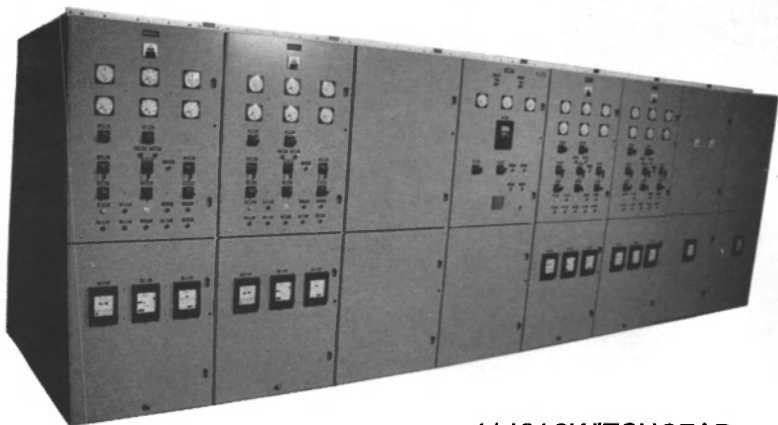
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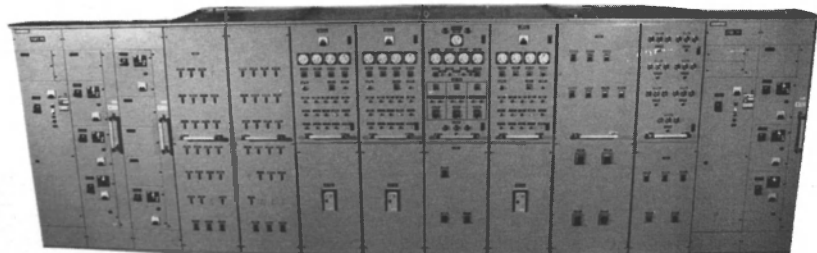
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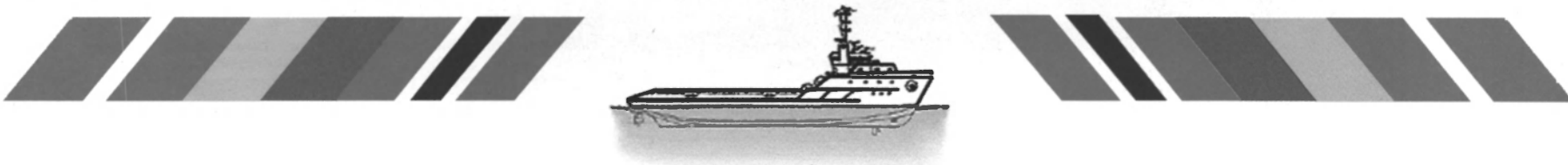
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Celebrity Zenith Arrives At Newport News

Celebrity Cruise Lines' vessel Zenith arrived at Newport News Shipbuilding (NNS) on October 18 for its bi-annual drydocking. Owned and operated by Miami, Fla.-based Celebrity, Zenith is in drydock at NNS for hull painting, survey and repairs as necessary for the

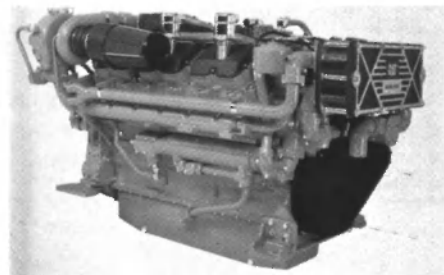
propulsion system, sea valves, thrusters, stabilizers and hull anodes.

Measuring 682 x 95 ft. (207 x 28.9 m), the 47,255-ton ship has been in service since 1992 — never docking anywhere but NNS since that time. Zenith's basic routes include Alaska, the Trans-canal, Bermuda, the Caribbean and Europe.

Circle 194 on Reader Service Card



Caterpillar's 3412E Provides High Power



Caterpillar's totally electronic 3412E marine diesel engine.

Caterpillar's Engine Products Division has introduced the availability of a new, totally electronic 3412E marine diesel engine with ratings from 503 to 1,400-bhp (375-1,044-bkW) for commercial marine application.

As compared to previous Cat 3412C engines, 3412E has upgraded horsepower, improved emissions control and enhanced midrange performance - with faster acceleration and improved cruising characteristics. The engine's superior reserved power enables it to respond quickly to increased load caused by adverse conditions such as swift currents, loaded nets and hard turns.

Test engines rated at 624-bhp (465-bkW) at 1,800 rpm are offering stellar results in two 70 ft. (21.3 m) twin-screw inland waterway tow boats - allowing for improved trip times. Compared to the 3412C, the upgraded engine provides the same strong 27-liter displacement, 12 cylinder vee, 4-stroke cycle diesel with the additional new electronic control and fuel systems, turbochargers and pistons.

The 3412E also has a new Electronic Control Module (ECM), and was rewritten with new software control maps developed for power and torque limits, air-to-fuel ratio control, fuel rail pressure and timing. The model is known as the only marine engine of its size to boast maximum power curves above 1,200-rpm - due to Cat's patented Hydraulically-Actuated, Electronically-Controlled Unit Injector (HEUI) fuel system. The system, which uses an oil pump to pressurize fuel at the injector, provides full actuation pressure at 40-100 percent rated engine speed, for improved fuel atomization and complete fuel burn.

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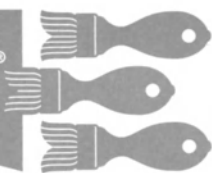
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New Orders Increase Dramatically - But Orderbook Fails To Rise

New ship orders reported have increased dramatically, according to figures published by Lloyd's Register (LR) in its quarterly World Shipbuilding Statistics. In the quarter to June 1999, new

ship orders rose by 43 percent over the previous quarter, to 6.5 million-gt.

However, the total world orderbook remains at 53.8 million-gt, as completions slowed during the quarter, down

Shiptype	June 1998		June 1999	
	No. of ships	GT	No. of ships	GT
Chemical	187	2,390,793	153	2,107,718
Crude Oil Tanker	182	16,908,504	156	16,554,056
Oil Products Tanker	166	4,420,753	136	3,876,561
Bulk Dry	291	10,292,330	244	9,095,567
General Cargo	420	2,657,792	439	2,548,569
Totals	1,246	36,670,172	1,128	34,182,471

some 30 percent (2.4 million-gt) to 5.5 million-gt, although the 8 million-gt reported for the March 1999 quarter was

exceptionally high. Completions are now at a similar level to the reported average figure for the years 1995 to 1998 at between 5.1 to 6 million-gt.

Japan and South Korea still show their domination of the market with total orderbooks of 18.9 and 17.4 million-gt respectively, although both have shown a small decrease in the total number of vessels over the same quarter last year. Perhaps more significantly, Japan has also seen a decline in terms of tonnage, with a total orderbook down 6.1 percent from 18.6 million-gt to 17.4 million-gt over the same quarter last year. South Korea's orderbook shows an increase of 2.7 percent (0.5 million-gt) over the same period.

During the period, China's orderbook increased by 14.3 per cent to 2.8 million-gt. Germany's ship orders fell by 20.5 percent to 1.8 million-gt, pushing Germany down the league table from fourth place to be overtaken by Italy. However, in terms of tonnage, the Italian orderbook has shown no noticeable increase over the same period.

Overall, the world orderbook has dropped 1.7 million-gt during the twelve-month period to June 1999. The table above — detailing five of the main cargo carrying shiptypes — shows a decrease totaling 2.5 million-gt, a fall of 6.8 percent.

In the same period the passenger/RoRo cargo and passenger cruise orderbook increased significantly: 26 vessels (24 percent) up on the previous figures, with a jump in total gross tonnage of 36 percent — a gain of just

Shiptype	June '98		June '99	
	#s ships	GT	# ships	GT
Passenger/RoRo cargo	69	600,326	83	1,114,581
Passenger (Cruise)	41	2,573,137	53	3,193,801
TOTALS	110	3,173,463	136	4,308,382

over 1.1 million-gt (see table directly above).

Compared with the same quarter last year, the delivery schedule of the world orderbook for June 1999 shows that 36 percent of the of the orderbook is expected to be completed this year, with 47 percent

Scheduled for completion in 2000, and just 17 percent in 2001 or later. The June 1998 figures showed a rather different picture with 29 percent expected to be complete in 1998, 48 percent in 1999 and 24 percent in 2000 or later.

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Circle 376 on Reader Service Card

Gulf of Mexico

(Continued from page 46)

ship and boatyards in the U.S., such as Bath Iron Works, Friede Goldman, Alabama shipyard, Avondale, Halter Pascagoula, Halter Equitable and Bollinger.

Bender's First Operations Shop — which at press time was scheduled to open with full functionality at the beginning of 2000 — represents the latest advances in materials processing, as well as laser cutting. According to the company, the 6 kW laser system to be installed offers many quality advantages, including an accuracy withing .004-in. In addition, part repeatability is nearly 100 percent, and there is no degradation of the beam quality over the course of the cutting program between normal, routine maintenance.

Steiner Steps Up

Steiner Shipyard, with origins as a family shipyard dating back to the 1920s, is certainly a well-known and regarded entity in the local maritime markets. Howev-

er, Steiner is far more than a local player, as it counts companies around the globe, including Japan, as good customers in standing.

Steiner is perhaps best known for its endeavors in the fishing vessel markets, as it has built hundreds of boats over the years. But the company's activities are broadly stretched, a strategy, which has yielded dividends as cyclical trends on occasion touch one or more of the branches. The latest business opportunity for Steiner revolves around a new company dubbed Enviro-Metals. Featuring a Wheelabrator metal processing unit, used to preblast millscale (the coating on metals that must be removed before the metal can be painted). The unit is housed in its own building, which is a great benefit toward complying with EPA guidelines. In fact, Russell says, the Alabama Conservation Department

has even issued tickets if sand goes into the water during the blasting process — a far more likely result for yards still blasting in open air.

The tighter regulations on blasting and coating mean small boatyards need to employ such a process; however, the prohibitive cost of the unit makes the prospect



(l-r) Tara Steiner Marhsall (Russell's daughter), vice-president; Russell R. Steiner, president of Steiner Shipyard, Inc.; Russell T. Steiner (Russell's son), director of inventory sales.

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Gulf of Mexico

a bit unfeasible. Therefore, Steiner's hope is to offer the company's services to local, smaller shipyards.

"We'll do it all," Russell says, "we'll cut, blast, prepare the metal. All the shipyard will have to do is assemble the hull." Steiner is no stranger to such an

arrangement, as the company already subs out some expertise work of its own. With only 100 manufacturing employees, such tasks as electrical work, carpentry, refrigeration and electronics are among the jobs subbed out to local businesses.

Sonsub Polar Prince Under Charter Contract

Sonsub A/S has been granted a short-term bare boat charter contract by client Esso Norge AS to support the Balder Field project operations. Various works

will be completed in the Offshore Balder field off the coast of Norway. Sonsub services include the provision of its new DP vessel, Polar Prince, which will be operated by 13 vessel crewmembers.

R&B Falcon Drillship Sustains Damage

R&B Falcon's drillship Deepwater Pathfinder sustained damage recently when 20 joints of the vessel's riser and its blowout prevention equipment fell to the seabed in about 7,000 ft. (2,133 m) of water while preparing to continue drilling operations in the Gulf of Mexico offshore Louisiana. None of the personnel onboard was injured, but the drillship's top drive and traveling equipment was damaged. A full investigation is currently underway to decipher the full extent of the accident.

Marinette To Launch U.S. Navy Vessel

Marinette Marine Corp. launched the U.S. Navy's Barracks Craft (APL-65) into the Menominee River at a ceremony on October 30.

The vessel was christened and launched in memory of the late **Roger Derusha**, who served as president and CEO of Marinette from 1970-1991 and as chairman from 1974-1999. Sponsored by Derusha's wife, **Marilyn**, the vessel is part of a two-part \$32.5 million contract that was awarded to Marinette by the Navy in 1998.

Holland & Knight Names Exec. Partner

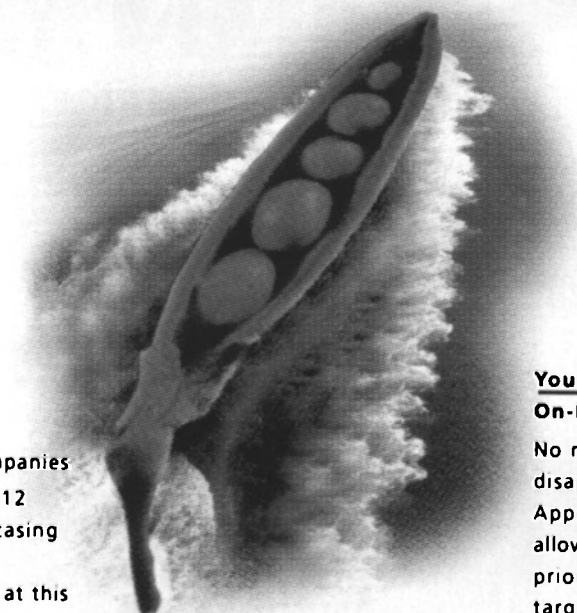
William J. Honan was appointed executive partner of the N.Y. office of Holland & Knight LLP, effective October 1, 1999. As executive partner, Honan will focus on the continued growth of the N.Y. office, as well as the ongoing expansion of the firm into new practice areas.

Hvide Marine Reports 3Q Loss

Hvide Marine Inc. reported a net loss of \$20.1 million or \$1.29 per diluted share on revenues of \$86 million for the quarter ended September 30, 1999. In the period one year earlier, the company had a net income of \$3.9 million or \$.25 per diluted share on revenues of \$100.1 million. Results in the current quarter and year-to-date have been adjusted to reflect the consolidation, as of September 30, 1999 of Lightship Tankers LLC, a 50.7 percent owned subsidiary, which was previously accounted for under the equity method.



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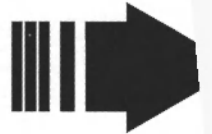
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107	Airchime Manufacturing Co. Ltd.	sound signal systems	202	106	Leevac Shipyards	shipyard	28
52	Alaska Diesel	propulsion	382	3	Leica Navigation	marine navigation	28
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90	All American Marine	marine equipment & supplies	203	20	Loews L'Enfant Plaza Hotel	hotel	38
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67	Griffin Oaks Marine Management	marine management	372	90	Summer Equipment Ltd.	steering gear systems	33
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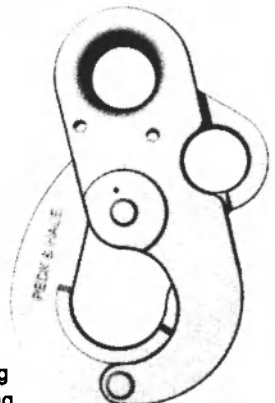
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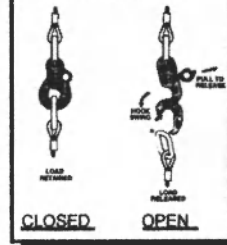


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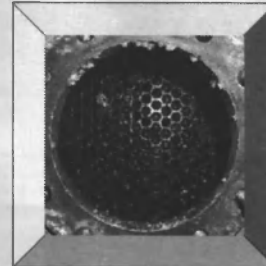
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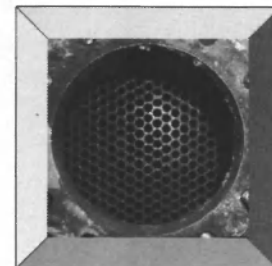
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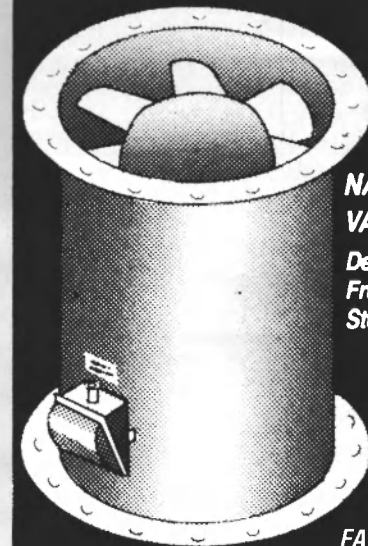


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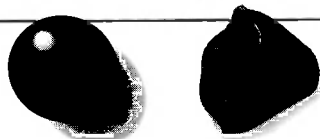
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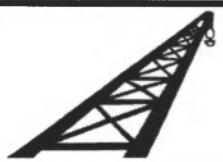


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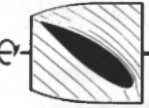
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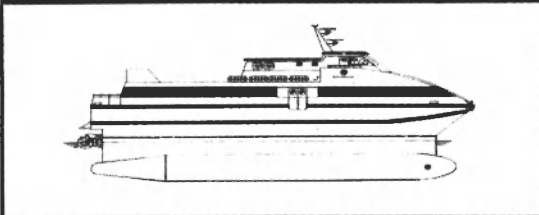
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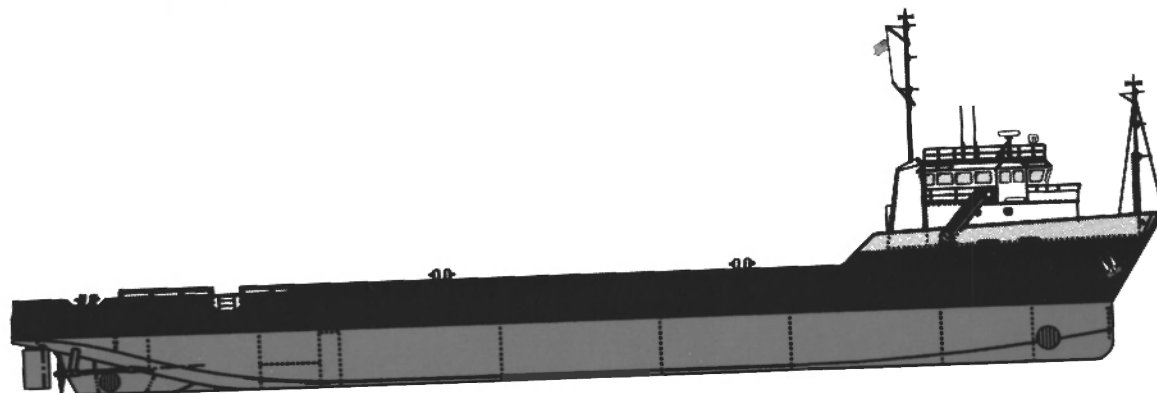
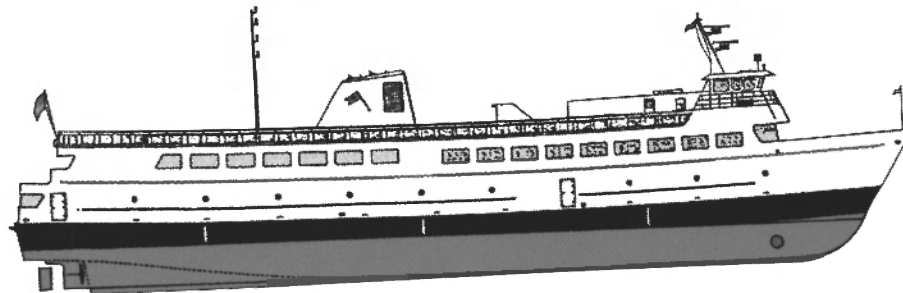
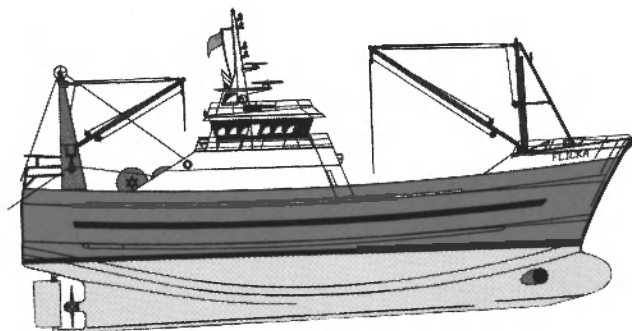
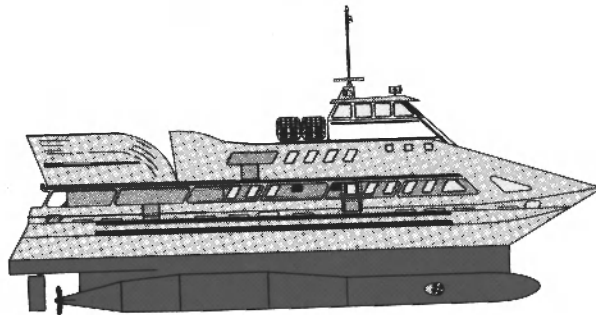
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