SEPTEMBER 1998

MARITIME REPORTER

AND ENGINEERING NEWS

new view of marine Technology

Special Pull Out Section: Marine Propulsion Technology
Shipbuilding Demand: Prepare Today For The Coming Boom

SMM '98: German maritime review • Renaissance goes luxurious with French-built R. One Marine engineering solutions • Benefitting from the SatCom revolution

nvestment in Design: Chemtanker features new coating instead of more costly stainless steel

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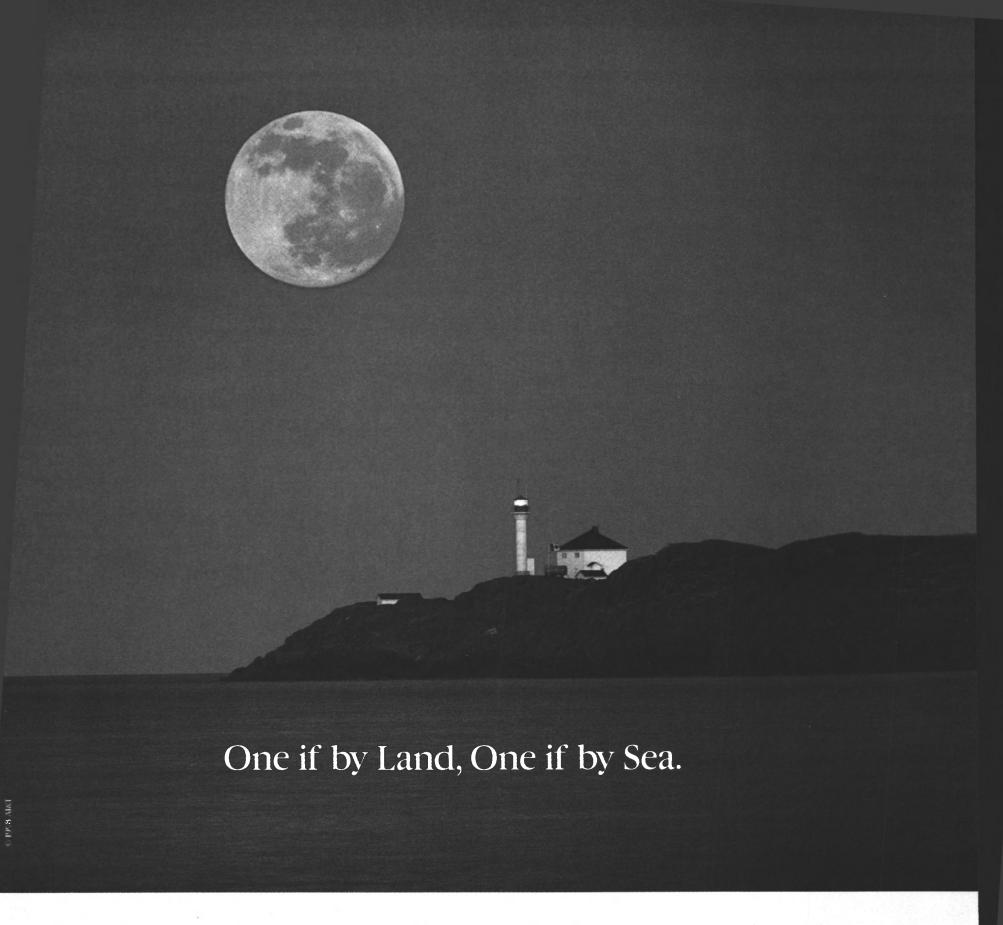
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Vol. 60

MARITIME REPORTER

ENGINEERING NEWS

ISSN-0025-3448 USPS-016-750

No. 9

118 East 25th Street New York, NY 10010 (212) 477-6700

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Founder: John J. O'Malley 1905 - 1980

Pictured on this month's cover is a computer generated image of a bridge from Finland' Deltamarin using the latest version of Catia. Catia — a complete CAD/CAM package its features are highlighted in this month's Marine Engineering section, starting on page

All Dressed Up

By using the MarineLine tank coating systems in lieu of stainless steel tanks on its new chemical carrier, Mediterranea di Navigazione saved money without sacrificing performance.

— by David Tinsley

Prepare Now For 2002... 10

...because that is when the next spike in tanker and bulk carrier building will occur.

Cruise Adventures Abound Aboard R. One The latest addition to the Renaissance fleet is an upscale beauty.

SMM '98: German Maritime Review

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As competition in the satellite communication sector heats-up, the cost, availability and capabilities of service will only get better.

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Special Marine Propulsion Pull-Out Section

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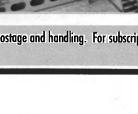
Inside this edition

Maritime Reporter/Engineering News is published monthly by Maritime Activity Reports, Inc. Mailed at Periodicals Postage Rates at Waterbury, CT 06701 and additional mailing offices

Postmaster send notification (Form 3579) regarding undeliverable magazines to Maritime Reporter/Engineering News, 118 East 25th Street, New York, NY 10010.

Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 0970700. Printed in U.S.A.

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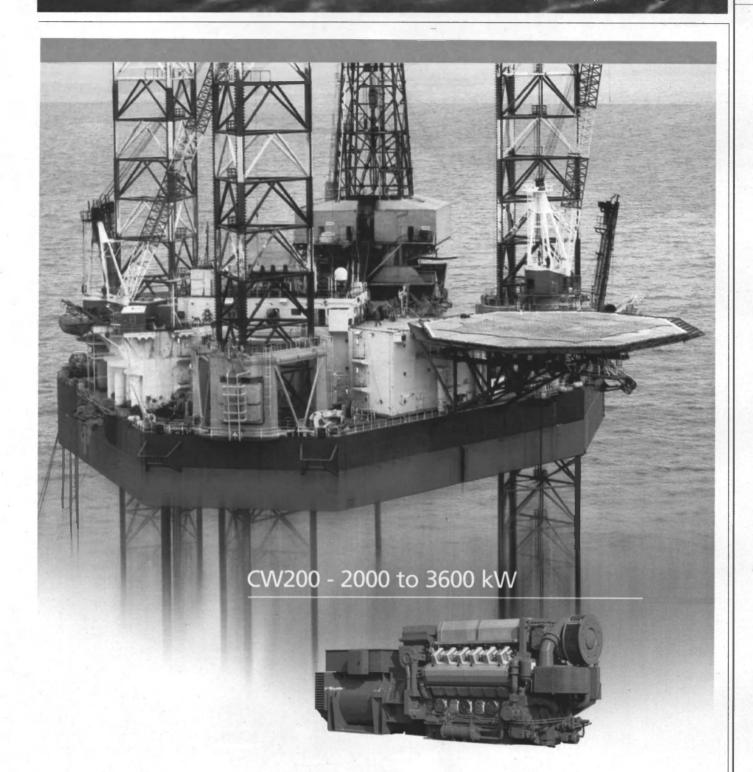
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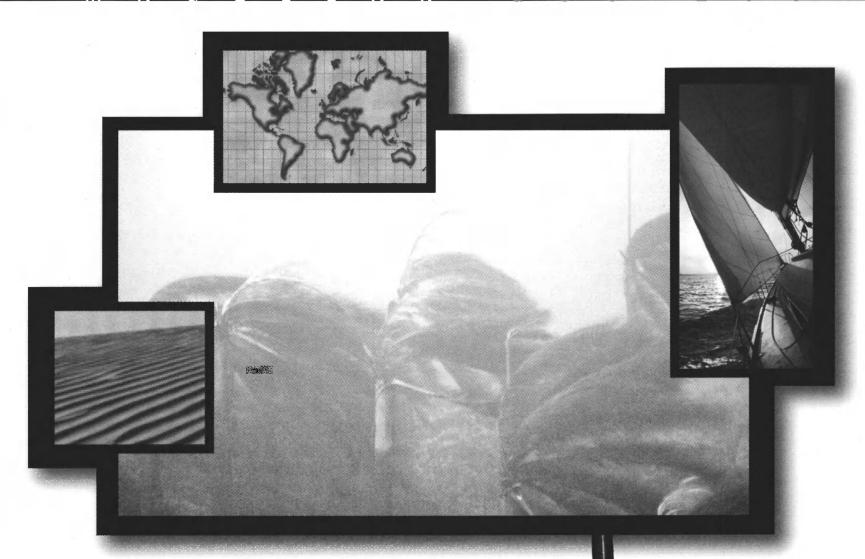
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EDITOR'S NOTE

Coming Full Circle

he upcoming SMM '98 show in Hamburg — one of the world's most prestigious ship machinery exhibitions — is regularly a stage utilized by the world's maritime equipment manufacturers to launch new



and improved products and systems. The landscape of SMM's 12 exhibition halls will likely directly reflect the trend of consolidation which continues to sweep every level of the maritime market, a trend which is leaving fewer but larger companies. It can be counted on, however, that SMM will reprise its role as host to the latest technological developments, served up to the tens of thousands of buyers who meander the show floor in search of the latest products designed to save time and

While maritime technology is a recurring theme within the pages of MR/EN, perhaps it is an opportune time to address the topic of maritime technology, or more accurately, to discuss its role in the day-to-day workings of vessel builders and vessel owners. Technological development, in and of itself, will continue to amaze, challenge and entertain the general world populous. Individual developments designed to squeeze precious schedules and budgets have, do and will continue to create new markets, regardless of the industry. It is the integration and the strategic employment of these technologies, however, that will help a given company make the quantum leap from competitor to leader. This point is of particular importance given the number of mergers sweeping the industry.

As fleet sizes and shipyard capacities double, the logistics required to ensure a continuous, smooth operation triple. In this light, a good relationship between buyer and equipment supplier is especially critical. By nature of their expansions, marine equipment suppliers are today positioned not only as manufacturers, but the developers of "systems" and the implementor of "solutions." Marine buyers should, in turn, utilize a supplier's given wealth of information and experience for their own company's benefit.

Two good examples of new technological solutions are highlighted in this month's Marine Engineering section, which begins on page 74. The latest version of Catia, a ship design and production software system, promises to help ship designers and builders produce ships more efficiently and cost-effectively.

Similarly, the ARCO case study on page 75 illustrates that not all "technological" advances are necessarily computer or electronics specific. Arco, by replacing its tanker's wire rope with a new cordage solution, helped shave up to 60 percent off of docking time, while improving worker safety as well. The ARCO study is an exemplary example of how to implement new solutions, as it tested the new ropes on two of its tankers for two years before rolling it out fleet-wide.

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Bucking The Trend

In choosing the MarineLine tank coating system over stainless steel for its newest chemical tanker's tanks, Mediterranea di Navigazione is saving money.



by David Tinsley, technical editor

Venetian trader

Eschewing stainless steel in favor of the innovative, U.S.-developed MarineLine tank coating system, Italian shipowning company Mediterranea di Navigazione has gone against the grain in current chemtanker newbuilding design.

The 14,000-dwt Sveva, which went down the ways in August at the compact, privately-owned premises of Cantiere Navale De Poli, is further distinguished by the adoption of a standby electrical propulsion drive and a protected bunker tank location behind an extended double-hull.

She is of added merit in her strengthened cargo section which will permit certain types of chemical gases, such as propylene dioxide, to be carried in liquid form. The attributes of the vessel type have been recognized by the petrochemical industry, with the result that the Ravenna-based shipowning firm, headed by Paolo Cagnoni, has secured a regular charter commitment to the vessel for coastwise trade into Venice.

Lower capital costs and higher ship productivity are claimed for the MarineLine patented polymer coating prepared and manufactured by Advanced Polymer Sciences (APS) of Ohio. Applied to high tensile carbon steel, it promises a comparable cargo range to that permitted by a more expensive stainless installation, and confers particular flexibility as to cargo sequencing, a vital factor in the efficiency of short-haul, chemical product parcel transportation. In a wide range of tests, MarineLine has been shown to be resistant to 98 percent of all acids, alkalis, solvents and fluids over wide temperature ranges.

The \$39 million Sveva adds an important newbuild testimonial on the Italian market to APS' steadily growing list of references, hitherto dominated by retrofit applications. A tanker of similar dimensions to be laid down on the Pellestrina Island slipway vacated by the launch of the Mediterranea di Navigazione vessel will, however, incorporate stainless steel encasement throughout her cargo section. The follow-on newbuild, ordered to

the account of the De Poli family's shipowning venture AR.CO., ensures continuity of production at the yard through 1999. Sveva incorporates features which reflect environmental, safety and service dependability considerations springing in part at least from the expectations of her prospective charterer, and of coastwise trade into the Lagoon of Venice.

An auxiliary power take-in (PTI) as well as power take-off (PTO) facility has been engineered into the tanker's reduction gearbox.

The arrangements will not only enable a shaft alternator to be driven directly from the gearbox for economical power generation at sea, but also confer a secondary propulsion capability whereby the shaft machine can function as drive motor, delivering power to the propulsion shaft in an emergency. In PTI mode, electrical energy would be fed from two of the vessel's auxiliary gensets. shipowner anticipates that a sustainable speed of 10 knots should be attainable with the secondary system, in good weather, compared to 15 knots in normal operation with the diesel-mechanical drive based on a six-cylinder MAN 48/60 medium-speed engine.

Sveva Main Par	ticulars
Length, o.a	446 ft. (136 m)
Length, b.p.	415 ft. (415 m)
Breadth, moulded	75 ft. (23 m)
Depth, moulded	40 ft. (12.25 m)
Draft, max	
Max DWT with shallow draft	14.000 tons
Engines	
Coatings Advance	red Polymer Systems
Power, mcr	6.300 kW
Speed	
Classification	
Tanks	

	2 deck slop
******************	uock siop

Modern turret ships

The latest entrant to the year ound offshore shuttle traffic in the rigorous environs of Europe north-west continental shelf, the 126,650-dwt Navion Britannia provides a new reference for Norwegian submerged turret loading (STL) technology as part of the ship's range of crude oil uptal options.

First adopted five years ago of the Fulmar field, in the British se tor of the North Sea, STL confe improved safety in oil transfe operations and is largely indepedent of weather conditions. offers higher weather threshold than other loading systems a



The Astilleros Espanoles-built Hanne Knutsen feature the revolutionary STL loading system.

gards both circumstances under iich disconnection is required d connecting-up can be made, tter ensuring dependability and ntinuity of supplies. The generon of shuttle tanker encapsulatin Navion Britannia is concive to the flexible operating ofile and services provided by ivanger-based Navion, which ploys vessels in a multi-field, lti-customer trading pattern in port of contracts of affreightnt (COAs). A product of accomshed shuttle tanker builder illeros Espanoles (AESA), the v Norwegian crude carrier's L facility complements her stand, top bow loading (BL) station s a conventional midship mani-. Under STL arrangements, the merged and moored STL buoy, ted in the vicinity of the offre accumulation, is pulled into bottom of the foreship hull secof an arriving shuttle tanker. loading hose runs through the y to a swivel, or rotating conor, which enables the ship to thervane freely, remaining on to wind and waves. The em is currently in use on the , Njord, Harding and Heidrun s of the Norwegian Sea and hern North Sea, and has also specified for the Aasgard C age ship. Oil storage has, in been superseded on Heidrun ne use of two parallel STL sysi, in a solution dubbed direct tle loading (DSL). Not only t reduced costs by eliminating reed for a storage vessel, it has red availability of supplies in periods of extreme weath-Vavion reports that DSL on run has achieved normal loadegularity at times when other s have been compelled to limit uction or temporarily shut Two 131,000-dwt dieselric shuttle tankers delivered 195 by AESA to Statoil, the r shareholder in Navion. died the STL system, as does nulti-purpose shuttle tanker ') class currently deployed in iction/drill ship configura-

L also forms part of a new l concept proposed by Navion ading and transporting oil in waters, arising from a feasistudy for a field development orthern Russia. The Arctic le is based on the use of a se-designed oil barge, proby a pusher icebreaker, can also be decoupled to act ure icebreaker in particular-ficult conditions. On the

field, the barge would be connected to an STL system specially reinforced for use in ice. When not engaged in attending and transferring the carrying unit, the icebreaker tug would be available to perform additional functions such as supply duties, icebreaking around the installations, and potentially also firefighting, rescue response and oil spill clean-up.

The discovery for which the STL-based integrated tug-barge solution has been advocated lies in an area covered with ice up to more than a meter thick for as much as seven or eight months of the year. Ice can often raft as much as 5-m high and extend more than 12-m below water level.

Adapted to STL technology, a system designated submerged turret production (STP) has also been specified and adopted for the Lufeng field off China and Britain's Pierce development. Navion Britannia has been prepared for STP duties, if required at some stage, giving her added long-term operating versatility.

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Set Your Clock For 2002: New ASIS report finds that next big push of tanker building to take place between 2002-2004

Shipbuilding demand for tankers will increase between the years 2002-2004, boosted by the demand for replacement tonnage from scrapped 1970s-built VLCCs,

while demand for bulk carrier newbuildings will turn positive in 2001 and steadily increase, according to a study released by The Association for Structural Improvement of The Shipbuilding Industry (ASIS), Japan.

ASIS, which has been conducting research on world shipbuilding demand since 1991, based this

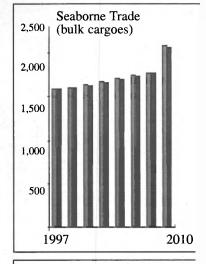
year's results on two scenario because of the uncertainty of th Asian financial crisis. The repor contains medium and long-tern shipbuilding requirement fore casts for tankers and bulk carrier of 10,000-dwt and above untaround the year 2010.

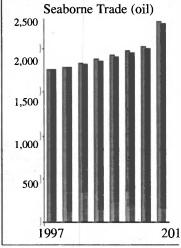
(In the ensuing report, scenari A assumes that the Asian econom will recover within a short tern i.e. about two years; scenario assumes that the Asian econom will recover in about four years.)

The World Economy

Economic expansion in the U. has continued since spring 199 The highest growth rate in the la nine years was achieved in 199 Although this growth will slight decrease after 1998, U.S. econom growth is expected to continue be stable for the time being.

European economies have be improving since late 1996 and a expected to continue after 1998. As a whole, Europe will maintate economic growth despite varitions from country to country. Japan, reduced disposable incorand a severe business climate has adversely affected the entire economic growth despite varieties.







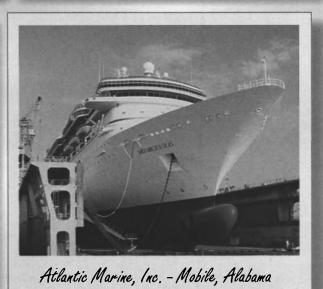
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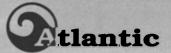


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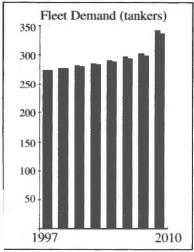
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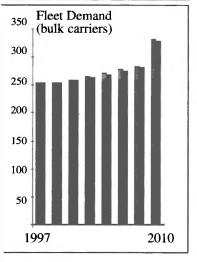
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omy since 1997. As a consequence, the Japanese economy is expected to recover and maintain the same level of economic growth rate as the U.S. and Europe. On the whole, economic growth in developed countries is estimated to be slightly over two percent after 1998.

Meanwhile, in developing counries, the picture is a bit less clear. The Asian economy, which had een characterized by strong coninual growth, is now deeply lepressed for a number of economc factors which came to a head in he autumn of 1997. It is anticipated, however, that Asia will ight itself and again start on the ast track of industrial and ecoiomic development. It is, however, mpossible to accurately predict low or when this will take place, esulting in the split scenario stiplated by ASIS in its report.

Looking at other developing ountries, the Chinese economic rowth rate in 1997 was at a lightly lower level compared with revious years, but high growth ras nonetheless achieved. China rill --- despite a possible stall from vents in S.E. Asia - likely mainain its current high economic rowth rate in the medium and ing term. The economy of the forier USSR looks to be gradually





improving, while Eastern European countries have also shown business expansion and economic improvement.

Trade Patterns

Predictably, the Asian financial crisis, which had been and was expected to continue driving the largest percentage increases of seaborne oil trade, has had a slightly negative effect on nearterm prospects. Seaborne oil trade in 1997 showed a high increase rate of four percent because of the steady rise in oil consumption

worldwide, and the slowdown in the expansion of short-haul trade due to a fall in the growth rate of oil production in Europe.

In 1998, as oil consumption in Asian countries will stagnate and short-haul oil trade will expand owing to the rise in oil production

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Broadcast from: North Point, Hong Kong

"For Sale* New arrival of the following engine parts:

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- 1 x RD44 new cylinder liner, new cover, new piston cpl. (Trading Company)"

Broadcast From: Piraeus, Greece
"Top Urgent** We are looking for the following ** Top Urgent
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Broadcast From: Singapore

"Wanted for sw cooling pump. Maker: Heishin pump works type: VSK-80J S/N:111844 4pc mouth ring, 1 pc foot sleeve, 2 pc shaft sleeve, 1 pc foot cover, 2 pc neck bush, 2 pc seal cage, 1 pc packing gland, please fax your offer to (Trading Company)'

Broadcast From: Houston, TX "We are looking for two (2) BBC turbochargers model VTR-354-11. New or used in good condition. Please respond via fax to (Service and Repair Company)"

Broadcast From: Spelle, Germany

"For Sale: Reconditioned crankshafts: Deutz BA16M716, RBVBM545, BV12M 628, MAK 6M331AK, 6M452AK, 8M453AK, MAN 8120/27, V8V22/30A, V6V16/18, MWM TBD510-6, TBD440-8, TBD441-16, MTU 12V331, 16V396, Warstila 6R32, Daihatsu 6DS22, Pielstick 18PA6-280, SKL 8NVD48-A2 and 40 Others. (Supplier)"

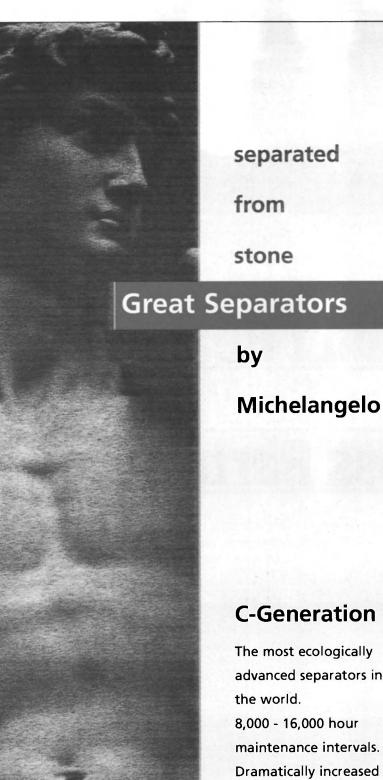
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in Europe and Latin America, seaborne oil trade will not increase very much. After 2002, seaborne oil trade is expected to increase at a stable rate. As shown in the accompanying chart entitled Seaborne Trade (Oil), the differbetween the ence Scenario A and B statistics in 2010 is 31 million tons.

On the bulk cargo side, increased crude steel production accelerated seaborne trade for iron ore and coking coal 1997. in Simultaneously, genpurpose coal transport increased due to rising consumption at thermal power stations and seaborne

Seaborne Transport & World Fleet Demands

(1997 through 2010)

Seabori	ne Trade	(Oil)						
Year	1997	1998	1999	2000	2001	2002	2003	2010
Case A	1,753	1,793	1,832	1,878	1,926	1,976	2,024	2,327
Case B	1,753	1,793	1,824	1,861	1,903	1,953	1,999	2,296
Seabor	ne Trade	(Bulk C	argoe	s)				
Year	1997	1998	1999	2000	2001	2002	2003	2010
Case A	1,590	1,594	1,630	1,668	1,708	1,747	1,783	2,081
Case B	1,590	1,594	1,625	1,658	1, 69 5	1,732	1,768	2,061
Fleet D	emand (T	ankers)					
Year	1997	1998	1999	2000	2001	2002	2003	2010
Case A	273.3	276.9	281.4	285.5	290.9	296.7	3 01.6	341.3
Case B	273.3	276.9	280.3	283.2	287.9	29 3.5	298.3	337.1
Fleet D	emand (E	tulk Ca	rrers)					
Year	1997	1998	1999	2000	2001	2002	2003	2010
Case A	254.1	253	258.9	265.2	271.7	278.2	284.1	332.4
Case B	254.1	253	258.1	263.4	269.4	275.5	281.4	328.7
								10

NOTE: (In the ensuing report, scenario A assumes that the Asian economy will recover with in a short term, i.e. about two years; scenario B assumes that the Asian economy will recover in about four years.)

grain trade began to grow. All changed in 1998, though, as Asia demand, or lack thereof, of crude steel consumption reduced iron or and coking coal shipments. In medium to long-term forecast seaborne bulk cargo trade will grow. Looking at the Seaborne Trac (Bulk Cargoes) chart, the difference between Scenario A and B will 20 million tons in 2010.

Based on these projects, the fleet demand for tankers was 2.7 pe cent in 1997. The rate will decrease to 1.3 percent in 1998, due to slowdown in the expansion of seaborne oil trade. The increase ra will rise after 1999 according to the expansion of seaborne oil trac The tanker fleet demand is anticipated to increase by 1.9 percent increase rate of the fleet demand for bulk carriers was 3.8 percent 1997, but will decrease .4 percent in 1998. Through 2010, fle demand for bulk carriers will increase by around two percent or mo triggered by a comparatively steady increase of bulk cargoes as ma itime transport.

USCG Deepwater Program Contracts Announced

The U.S. Coast Guard (USCG) has awarded three, 18-month study contract regarding its Deepwater Program, which is a program to modernize the U.S. Coas Guard's aging fleet of ships and aircraft. Upon completion of Phase i of the stud contract the USCG will pick one, two or three of the best solutions to participat in Phase II — which will define the system and its costs in more detail. Phase will involve selection of one team for procurement. It is anticipated that the first ship construction contracts will be awarded to the ultimate winner in FY 200% Marinette Marine Corp. was a member of one of the winning teams. Marinetl Marine is teamed with SAIC (Science Applications International Corporation Sikorsky (a United Technologies company), Bath Iron Works Corporation (a Gener Dynamics company), and others. SAIC is the prime contractor and responsible for leading the team, performance systems modeling and electronic integratio Marinette Marine will lead the surface system effort and be responsible for all sh assets. Sikorsky will lead the aviation effort and be responsible for those asset Bath Iron Works has responsibility for engineering support, and will support ar likely share in ship modernization and large ship procurement, as part of the st face systems effort. The size and complexity of the Deepwater Program replace 41 high and medium endurance cutters, 49 patrol boats, helicopters, fixe wing aircraft and implementing a new command, control and surveillance syste requires a multifaceted team.

ilding Demand

supply and demand is a cause of great business itical concern. Riding the y's peaks and valleys has been an exact science, but s little doubt that too much e on the world market has — combined with a host of factors, including subsidies p shipbuilding prices artifiow for many years.

S calculates that the world upply and demand will be in se by 2002. Based on this option, as well as the previmentioned statistical analy-SIS projects that shipbuild-demand for tankers will ase until 2001. After that, it ncrease — as previously mend — driven by the need to ce 1970s-built VLCCs and to nmodate the increasing needs a recovering Asian economies. building demand is expected ak in 2004.

nipbuilding demand for bulk ers will decrease until 2001. r that, shipbuilding demand bulk carriers will steadily ease, supported by replacent demand caused by bulk carscrapping and a steady ease in fleet requirement. As a alt, total shipbuilding demand tankers and bulk carriers will k in 2004 at 33.7 to 34.5 million

A Wins Major gineering Contract

The Naval Surface Warfare nter, Carderock Division, has varded the support contract for e Total Ship Directorate (Code to Naval Systems Associates (SA) LLC. The five year contract ill enable NSA to provide support shipbuilding technologies, cost perational effectiveness, design apport, computer modeling and mulation, and the logistics RDT E division within Code 20, at a st of \$26 million.

am Offshore Awarded ontract By Newpark

Sam Offshore, Ltd. has awarded contract to Newpark nipbuilding, for the repair and odification of its offshore jackup rilling rig the "NORAM 253."

In addition to general repairs, ewpark will perform topside odifications and skirt plate replacement

New Contracts Announced For V. Ships Florida And V. Ships Marine

V. Ships Florida and V. Ship Marine, Ltd., full-service international marine transportation management and operations organizations, were awarded two new contracts.

V. Ships Florida has been awarded a ship management contract by Trade Wind Tankers to manage seven tankers.

These specialty ships trade in

environmentally-sensitive waters surrounding Florida, Central and South America.

V. Ships Marine has been contracted by New SeaEscape to manage operations of its day cruising and gaming vessels, as part of their Florida and nearby coastal operations.

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Owners To Face Rising Insurance Costs

The shipping and marine business sectors are noted for being cost conscious. Whether they regard insurance as an obvious necessity or a necessary evil, recent overcapacity in the insurance market, generally, has left ship owners, cargo interests and a whole mass of players from shippards to brokers and forwarders in a relatively comfortable position. Inevitably, the cycle must turn back in insurers' favor. The vital questions are when? and will all sectors respond in the same way? The answers lie with the current "shakeout" processes being seen in the insurance markets.

Drewry shipping Consultants Ltd.'s latest Briefing Report Marine Insurance: Issues, Practices and Costs concludes:

• In areas where the quest for "market

share" remains — notably Cargo and Hull & Machinery (H&M) — the ferocity of competition will last longest.

• The Protection & Indemnity (P&I) sector is being pulled in opposing directions. Change will come to the International Group agreement as a consequence of the ongoing EU investigations and this may see the mutual P&I Clubs reduced in number through merger and consolidation. At the same time, choice for shipowners is being expanded as fixed premium P&I options gain credence.

• Marine Liabilities insurance is a very specialist area and perhaps, therefore, the sector most able to reverse the downtrend.

Drewry's report notes that the early 1990s

saw ship owner (and marine sector) insu costs rise substantially. There was an a turn which began in the second half of 19 with owners with good records seeing reductions. From 1995 to 1998 the rate 1 has been downwards with no real sugge that this would be checked. However, claims activity may be the catalyst the in ance market is able to respond to. Next could be important, but Drewry concludes ! will be a crucial year. Underwriting losses force a review. Hull and P&I rates should h en. The fact that this will coincide with rer al needs on current multi-year policies will to the year's market significance. Other cru issues will be the continuing "reconstruc and renewal" at Lloyd's, the globalization of





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t and the impact of "ticket to requirements — where the code provides the current g edge.

lose look at the main cateshows:

Cargo: Cargo insurance is nost international of the ne insurances. Insurance anies throughout the world der "their" cargo as a domessurance to be placed locally ne same token, they will view rs" cargo as capturable busi-

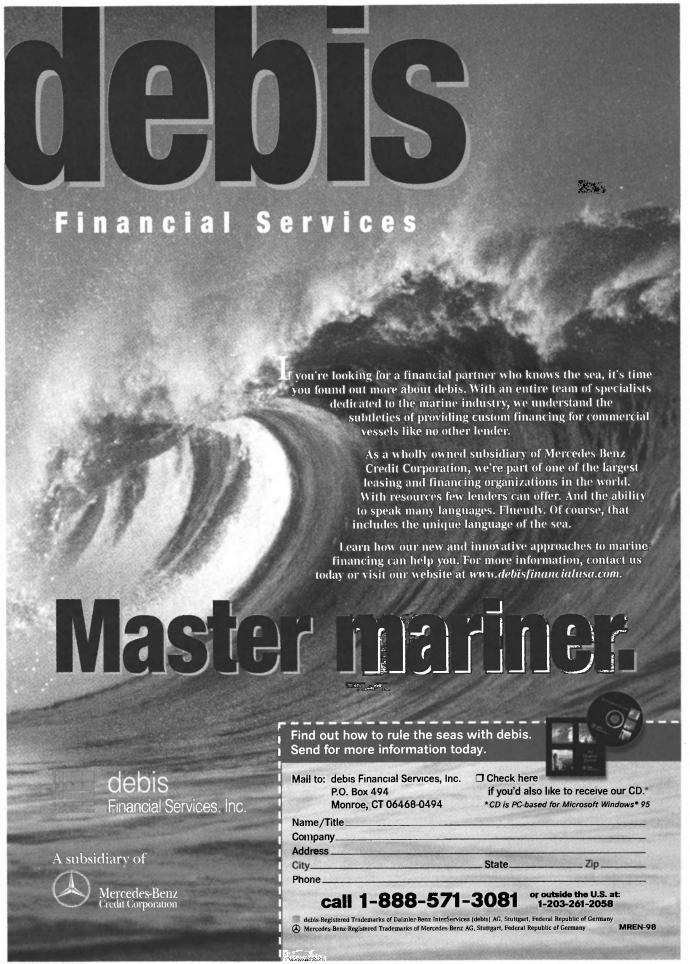
Cargo insurance, therefore, e most competitive. Despite current problems seen in a ber of Asian economies, there fundamental case against the er-term increase in world e nor is there any dispute that overwhelming majority of se volumes will continue to be red by sea. Therefore, unlike haps elements of H&M or P&I urances, Drewry's report condes this is not a "zero sum ne" and insurance underwriters d intermediaries will attempt to ain a larger percentage of an panding business activity. rgo owners will hope this comtitive approach will keep premins low.

Hull and Machinery: The erriding Hull and Machinery sue of the moment is the contining, and from the insurance idustry standpoint, apparently elf-defeating reduction in the prenium rates beyond what would be varranted by past experience.)rewry determines that the operaive ethos at the moment appears o be "market share." The current laims situation is very favorable and underwriters everywhere appear willing to downplay large claims of several years ago in the nope of consolidating their existing book of business. Inevitably, this mplies a short term approach and so relies a lot on hope. The worry s that it may prove to be a misguided hope. Shipowners will be nappy with developments that naintain the favorable status quo.

Protection and Indemnity: I'wo current developments will shape the manner in which P&I Clubs conduct their business in the future. They are: the investithe European gation by Commission into alleged anti-compractices oetitive bv International Group of Clubs; and the increased competition faced by the International Group from "outside" P&I insurers. The irony is that these two developments are almost opposites in their appearance. The first could reduce the number of clubs and by implication, reduce the element of competition. According to Drewry's report, a major restructuring of P&I insurers looks to be in prospect in the near term future. There will be more internal competition within the group. The old concept of a "supper club" may well resurface. Some clubs will merge or otherwise informally cooperate. Less viable clubs could disappear

with their place being taken by the fixed premium market. How all this will impact on ship owners' premiums may take time to assess but, it appears likely that owners will have greater choice.

• Marine Liabilities: The marine liability market is still con-



centrated among the specialist however, this increased activity insurers, particularly the various transport clubs and certain syndicates at Lloyd's. Some of these may regard the business as "nonmarine." The general trend, however, will be for a greater number of these activities to be insured in the marine market. Drewry notes,

may not — unlike other insurance sectors - manifest itself through reduced rates. The options available are more limited and the few insurers who are able and prepared to underwrite complex liability risks will keep a tight control over the terms and conditions

which they offer. Alongside these moves to much more specific cover is a more international outlook by customers. This has been gaining impetus from the tendency for large multinational management companies to contract for the operation of marine infrastructures anywhere in the world. This is

also happening among suppl stevedore services, and shiprepair yards are being aged by an outside group ur management contract.

Carnival Orders Two Shi For \$450M Each

Carnival Corp. reached agreement with the Fincar Cantieri Navali Italiani S.p.A the construction of two 102. ton cruise ships at a cost of a \$450 million each for its Carr Cruise Lines unit. The two vessels, which will be par "Destiny-class," will have a ba two capacity of 2,758 and expected to enter service in the of 2002 and the summer of 20 the company said.

MTN Signs Agreement With RCI

Maritime Telecommunication Network, Inc. (MTN), a subsidia of ICG Satellite Services, Inc., h signed a new agreement wi Royal Caribbean International install telecommunications equi ment. The three-year agreeme provides for C-Band telecommur cations service for passenger ar administrative voice, fax and dat communications. Installation the MTN system began on th Splendour of the Seas in April an will continue on the rest of th ships throughout 1998.

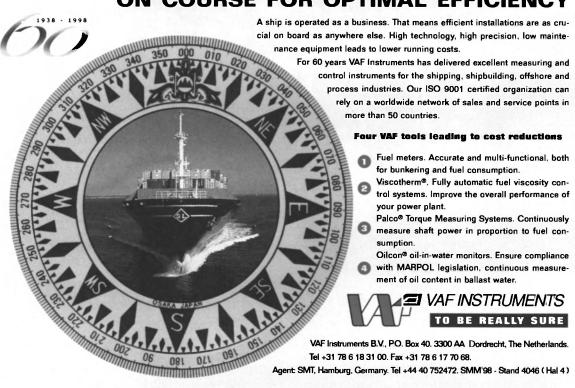
YVC Ysselwerf To Build **Multi-Purpose Vessel For** Simon Mokster Shipping

July '99 will see the delivery of a supply/standby/rescue/tug vessel to Simon Møkster Shipping of Stavanger, Norway with the possibility of a second vessel to follow. The 2,900-dwt vessel is being designed by Vik and Sandvik and will be a V&S 470 type. It is scheduled for use in a contract with Esso Norway.

Bisso Constructs Its First Reverse Z-Drive Tractor Tug

Bisso Towboat Co. Inc. has been constructing the first reverse Zdrive tractor tug, handling shipassist work on the Mississippi River and refurbishing the tug Jane S. The new tug will be 100 x 38-ft. $(30.5 \times 11.6-m)$. designed to generate 117,000 lb.

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bollard pull with a rating of 4,300 hp.

Main engines will be twin EMD 16-645 diesel engines, with two Aquamaster US 2001 Z-drives. The tug will be outfitted with a line handling hydraulic bow winch, stern capstan, quick release tow hook, and fire fighting monitor.

The tug is presently under construction at Main Iron Works in Houma, La. and is scheduled for delivery in November/December of 1998.

In addition, Bisso Towboat is also repowering and refurbishing the tug Jane~S., a 95 x 28-ft (28.9 x 8.5-m) vessel used for ship-assist work, although the ship is equipped with a double drum towing winch.

The tug is powered by twin Detroit Diesel 16V-149TI main engines with twin disc MG-540 reduction gears, Mathers shaft brakes and John Crane shaft seals. The 80 x 83-in. four-blade stainless propellers were set in 81-in. stainless steel kort nozzles. The vessel also received a new steering system, rudder and keel cooler modification, new exterior air intakes and ductwork for the main engines, new engine exhaust system, and stainless steel bits and bow staple. The Jane S. is rated for 3,600 hp and is currently operating on the Mississippi River.

Derecktor Shipyard Orders Oily Water Separator

Derecktor Shipyard has ordered a Nelson Bilge Boy Oily Water Separator from FCS for their new ferry Ernest Hemingway.

According to FCS, the new ferry will reportedly be the fastest passenger ferry operating in the U.S. The ferry is currently under construction and is scheduled for delivery in the Fall of 1998.

The Nelson Bilge Boy Oil/Water Separator meets the new U.S. Coast Guard requirement, effective July 1, 1998. The requirement calls for approved 15 ppm oily water separating equipment for processing of oily bilge slops on ocean going vessels of 400 gt and above, but less than 10,000 gt excluding ships carried ballast water in their fuel tanks.

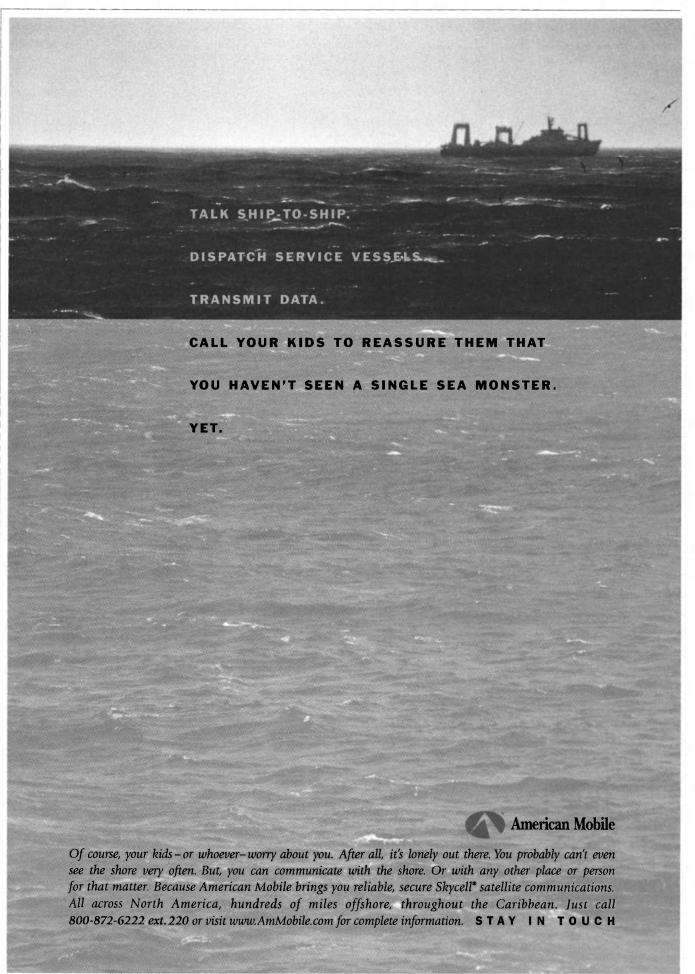
DML Team Wins Major Submarine Support Contract

A major contract to provide in-

service support to the Royal Navy's entire submarine fleet has been awarded by the U.K.'s MoD to a Submarine Management Group formed by DML, BMT Defense Services Ltd. and Systems Engineering & Assessment Ltd. (SEA).

Under the contract, the three companies working in close partnership will provide a range of design support services to all classes of submarines in service with the Royal Navy, covering the submarine itself, the combat systems on board and the technical data

relating to each submarine. The project will involve tasks ranging from designing modifications and designing the installation of new equipment to keeping up to date a master library of design information and drawings for each submarine.



Halter Wins Contract to Build Rocket **Booster Transport Ship**

Halter Marine Group was awarded a contract from Foss Maritime to build a RoRo ship at its Halter-Moss Point, Miss. shipyard. Foss was selected by the Boeing Co. to transport Boeing-built Delta IV rocket boosters from Decatur, Ala., to space vehicle launch sites at Cape Canaveral Air Station, Fla., and Vendenberg Air Force Base, Calif. The new vessel will measure 310 x 82 ft. (95 x 25m), with a 12 ft. (3.6m) normal ocean operating draft. The ability to vary the draft enables the vessel to operate in shallow inland waterways, as well as in open oceans. It will be powered by two diesel engines, each in a separate room, developing a total of 8,000 hp. Propulsion will be provided by two 4,000 hp Z-drive thrusters, and there will be two 500 hp bowthrusters to aid in maneuvering. It will have four generators and an emergency generator. The ship will also have a helicopter pad.

The new Foss ship will carry common booster cores along with associated containerized cargo. Because of their size, the booster cores must be shipped from Boeing's Decatur facility over water. The ship will be capable of navigating the Tennessee-Tombigbee Waterway to Mobile, Ala., and on through the Gulf of Mexico and the Atlantic to Cape Canaveral and through the Panama Canal and the Pacific to Vandenburg. Engineering has begun, and construction wil begin in early December.

Circle 104 on Reader Service Card

Damen To Build Two Tugs For Cory

Cory Towage Ltd. (U.K.) has placed a contract with Damen Shipyards for two omni-directional tractor tugs intended for service at the Omani port of Mina Raysut, Salalah. The tug orders are the result of a contract between Salalah Port Services SOAG (SPS) and Cory Towage & Marine Services LLC in which Cory takes over the management of two existing tugs, workboat, personnel, pilotage service and maintenance of navigation aids, as well as providing the two new tractor tugs with additional pilots in 1999. The new tugs, due to be delivered in January and March 1999, will be powered by twin Caterpillar 3606 TA/CSR diesel engines which develop a combined 3,600 kW (4,828 bhp) at 1,000 rpm, driving through twin Aquamaster U.S. 2001 azimuth thrusters.

Three New OSVs for Edison **Chouest Offshore**

Alabama Shipyard, Inc. has reached an agreement with Edison Chouest Offshore, LLC of Galliano, La. to build three offshore supply vessels (OSV) with an option for an additional vessel. Principal dimensions are 240 x 56 x 21 ft. (73 x 17 x 6.4 m). Construction has begun and delivery of the first vessel is expected in December, with the remaining vessels to follow on a monthly basis.

Circle 96 on Reader Service Card

Newpark Shipbuilding Awarded **Diamond Offshore Contract**

Diamond Offshore (U.S.A.) has awarded a contract to Newpark Shipbuilding for the repair and modification of its semi-submersible offshore drilling rig the Ocean Prospector. The rig arrived at Newpark's Galveston operations at the end of July.

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Litton Marine Systems Receives IBS Orders for Korean Newbuilds

Litton Marine Systems has received orders to supply integrated bridge systems (IBS), radars and other systems for 18 newbuilds in Korean shipyards. The IBS are based on Sperry Marine's Vision 2100 technology and will include navigation station, conning station and planning station with chart digitizing table. In addition to the IBS orders, Litton has won contracts from Hyundai to supply autopilots, gyrocompasses and radars for four VLCCs under construction for A.P Moller, and radars and voyage management systems (VMS) for four VLCCs being built for operation by Hyundai Merchant Marine.

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addition to easy-to-read screens and numerous single button features, the MX 400 provides four NMEA input/output ports for interfacing with other on-board electronics. And, it's all protected by a rugged, splash-proof housing. The Leica MX 400 delivers

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MARINE FINANCE

ribal Enterprise To Build ourth Ferry

The Mashantucket Pequot ribal Nation has announced an greement with Catalina Express f San Pedro, Calif. for the contruction and purchase of a high-peed ferry, the fourth to be built by the tribe's Pequot River Shipworks in New London, Conn. Catalina Express intends to use he 300 passenger, Catalina-class erry in service between the ports of Long Beach and San Pedro, Calif. and the town of Avalon, Catalina Island.

The all-aluminum catamaran lesign is 133 ft. (41 m) long, and is powered by twin Detroit Diesel engines, 3,110 hp each. The approximately \$6.5 million vessel will have a cruising speed in excess of 40 mph.

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Austal Ships Wins Irish Ferries Contract

Irish Continental Group PLC have purchased an Auto Express 86 vehicle-passenger catamaran from Austal Ships, scheduled to enter service in the summer of 1999.

The aluminum catamaran will be operated by Irish Ferries on the 60 miles Holyhead - Dublin route, with up to four return crossings per day in the summer months.

The vessel, powered by four

DD 21 Alliance Awarded \$68.5 Million For Phase I Design Work

The Navy has awarded a \$68.5 million contract to the DD 21 Shipbuilder Alliance for Phase I system concept design work in the DD 21 Destroyer Program. The Alliance comprises Bath Iron Works (BIW), a General Dynamics Company located in Bath, Me., and Ingalls Shipbuilding division of Litton Industries, located in Pascagoula, Ms. The companies have been designated as the two DD 21 shipbuilders, with BIW serving as the Alliance prime contractor for the first phase of the program. The Alliance and its two teams (BIW and Lockheed Martin; Ingalls and Raytheon Systems Co.) will receive additional funding for later design phases leading up to the selection of the winning concept and construction of the lead ship. Actual construction of the DD 21s by BIW and Ingalls will start in 2004.

Caterpillar 3618 engines each generating 7,200 kW, will accomodate 800 passengers and 200 cars (or 125 cars and 10 buses or trucks) at a service speed of 39 knots.

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Cochin Repairs Vessels

MV Bharat Seema, a passenger/cargo vessel operating between the main land and islands in the Union Territory of Lakshadweep, India, is undergoing repairs at Cochin Shipyard. Major structural repair and overhaul is involved with the ship's main engines,

steering gear, deck and navigational equipment. Accommodation spaces, lounges and cafeterias have been refurbished, and a prayer room has been added.

A double hull tanker, begun in

(Continued on page 30)





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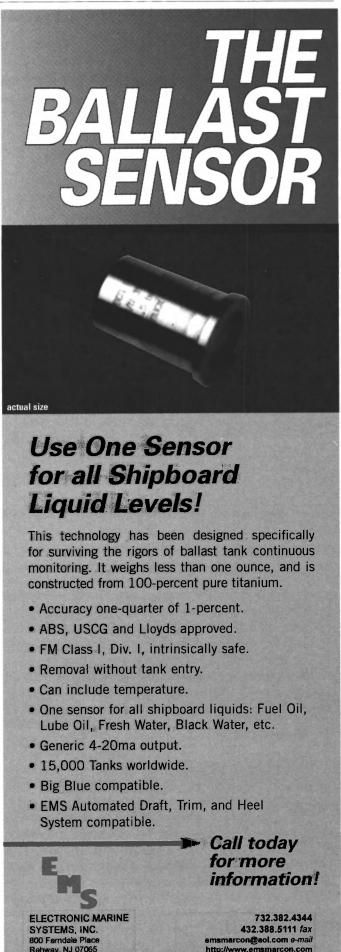
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Halter Delivers Second SDM



Halter Marine Group has delivered St. Johns, the second in a series of three revolutionary Ship Docking Modules (SDM) to Hvide Marine, Inc. Now in service at Tampa Bay, Fla., the vessel follows the first Halter-built SDM, New River.

The patented 90 x 50 ft. (27.4 x 15.2 m)SDM design, which requires only two crew members to operate, was conceived by Erik Hvide, chairman and president of Hvide Marine, Inc., and refined by the Elliott Bay Design Group.

The double-ended, 4,000 hp harbor tug has skegs mounted on each end, featuring Z-drives mounted forward and aft and offset 6.5 ft. from the center to provide 100 percent of its bollard pull in any direction. It can move sideways with a maximum draft of 16.2 ft. (4.9 m), or just 5.2 ft. (1.6 m) on the hull and 11 ft. (3.3 m) on the skegs.

Two Caterpillar 3516BTA diesel engines, developing a total of 4,000 hp at 1,600 rpm power St. Johns. They turn the Z-drives with 86 in. diameter propellers in nozzles. Maximum speed is 11.5 knots, with a service speed of nine knots.

The ship's service power is provided by two 75 kW Detroit Diesel 4-71 generator sets. A Markey DYSF-39 hawser winch is located on the deck and a 3,000 gpm remote-controlled fire monitor is mounted atop the pilot house. Protecting the saucer-shaped SDM is a 45,000 lbs. Schuyler model SR3D fender system.

Circle 105 on Reader Service Card

Tug Delivered to Caillou Island Towing



Caillou Island Towing, Houma, La., recently took delivery of a like-new boat that emerged from the charred remains of a 16-yr. old hull.

"We replaced ribs and hull plating," said Rory Dupre, operations manager. "We totally rebuilt the house; it's basically a brand new

For power, the company chose a pair of sixcylinder Cummins KTA 19M engines, turning shallow-pitched 62 x 42 in. open wheels. The 1,200 hp tug is 62×24 ft. $(18.9 \times 7.3 \text{ m})$, and carries a full slate of Simrad electronics in the wheelhouse, including radar, autopilot and GPS/Loran combination.

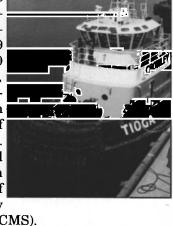
With accommodation for six, the vessel is involved with inland rig moving and offshore pipe barge movements. She is equipped with electric deck winches for rigging face wires to push equipment and H-bitts aft for soft line towing of barges.

The boat is also equipped with a pair of Cummins four-cylinder, B-series, 3.9-liter, 35 kW gen. sets.

Circle 106 on Reader Service Card

Crowely Acquires Tioga

Vessel Management Services (VMS), a Crowley Maritime Corporation sub sidiary, has purchased 85-ft. (25.9 m), Z-drive, 4,000 tug Tioga, through vessel brokers Marcon International, of Coupeville, Wash. VMS has entered into a long-term bareboat charter of Tioga to Crowley Maritime Services (CMS).



Built in 1994 by Tri-Star, Seattle, Wash., for ship assist work; CMS will employ Tioga for ship assist and escort work in and around Los Angeles and Long Beach Harbors.

"Tioga is yet another vessel employing the best achievable technology that will meet or exceed our customers' needs," said Jim Macaulay, CMS regional manager of Marine Operations for the Pacific Fleet. "It supplements Crowley's fleet revitalization program and furthers our commitment to having the most advanced, capable tugs."

Tioga is powered by Caterpillar 3516D1TA diesels and propelled by Ulstein 1650H Z-drives located aft. She develops a bollard pull of approximately 106,000 lbs., and a free running speed of approximately 13.5 knots.

Circle 107 on Reader Service Card

Guido Perla Provides Engineering Services

Guido Perla and Associates (GPA) is developing contract drawings, specifications and related bid documents for construction of two 300-ft. (91.4 m) U.S. flag coastal passenger vessels for Delta Queen Steamboat Company, subsidiary of American Classic Voyages.

Designed by GPA as state-of-the-art versions of turn-of-the-century period coastal packet steamers, the vessels will operate as inland and



coastal passenger vessels in domestic and international waters.

The successful shipyard will be selected based on competitive cost and schedule criteria, to be developed from the design documents. A formal bid opening has been selected for September 11, 1998. Contract award

Vessel Specifications		
Length:300 ft. (91.4 m)		
Beam: 50 ft. (15.2 m)		
Mean Draft,		
Full Load: 12.5 ft. (3.8 m)		
Displacement,		
Full Load: 3,000 ft		
Passengers:		
Crew:		
Cruising Speed:13 knots		

is expected in October. Delivery of the first vessel will be June 2000, with the second vessel due October 2001. The optional third vessel delivery will be negotiated.

An integrated diesel electric system will provide power for general ships' services, hotel and propulsion through four 1,800 kW generators. Propulsion will be provided by two 1,800 hp, 360-degree azimuthing Z-Drives with a 1,000 hp tunnel bow thruster for added maneuverability in tight docking situations.

Circle 108 on Reader Service Card

Gladding-Hearn Delivers First Commuter Ferry



Beam:33 ft. (10.1 m)diesel enginesZF BW450D Gensets:Cummins/ Onan MCGDA 70 kW Hydraulics System: . . Bird-Johnson Radar: (2) Furuno FR 8051 (2) Furuno FM2610 .Furuno GP 80D DGPS Depth Sounder: Datamarine **DDM 600** Fuel Capacity:2,800 gal. .200 gal. Fresh Water Capacity: .. .300 gal. 33 knots Speed (light): 37 knots

Gears:

VHF:

Sewage Holding:

Speed (loaded):

The first of two highspeed passenger catamarans for Boston-based Boston Harbor Cruises delivered Gladding-Hearn Shipbuilding, The Duclos Corp. These vessels will join two other, smaller, high-speed passenger ferries on Boston Harbor, which were also delivered by Gladding-Hearn.

The new ferries are designed $\mathbf{b}\mathbf{y}$ INCAT designs to carry 350 pas-

ngers at speeds exceeding 33 nots. The 121-ft. (36.9 m), all-aluinum catamarans, with a 33-ft. 0.1 m) beam, are powered by four ummins KTA-38M2 diesel ngines, each delivering 1,300 bhp t 1,800 rpm and driven by MJP-00S water-jets. The vessels' speed vill cut travel time between Hingham, Mass. and downtown 30ston from 35 min. to 20 min.

The three-deck ferries are equipped with bow pulpits and a viewing platform for offshore whale watching when not serving commuter passengers. On-board accommodations include three heads, heating and air conditioning, Turnbill airline-style seats, tables, lounge areas and two cocktail and food service bars.

Circle 109 on Reader Service Card

Halter Delivers Ferry to State of Alaska



Kennicott, the first U.S.-flagged, ocean-going passenger ferry built in decades has been delivered to the state of Alaska by Halter Marine Group.

The \$80 million, 381 x 85 ft. (116.1 x 25.9 m), 17.5 ft. (5.3 m) draft ferry, can carry 748 passengers on day cruises, or 500 overnight cruise passengers. It is the first vessel in the Alaska Marine Highway System fleet of nine ships capable of operating on all routes between Bellingham, Wash. And Dutch Harbor in the Aleutian Islands.

The 12,635 gt ferry, which displaces 6,000 tons, has more than 100 staterooms providing at least 314 berths with three classes of cabins: first class, tourist class and roomettes. The ferry features a RoRo design with a vehicle deck capable of carrying 120 cars or a mix of 39 cars and 20 45-ft. highway trailers. It is equipped with a fully enclosed 40-ton vehicle elevator, side doors and a stern ramp.

The ferry is powered by two Wartsila diesel engines developing a total of 13,380 hp, which provide a service speed of 16.8 knots and a maximum speed of 19 knots. Maneuverability is aided by a 2,113 hp bowthruster. Generators include two 2,400 kW power takeoff, two 1,440 kW diesel generators and a 385 kW emergency genera-

Circle 110 on Reader Service Card

New Dinner/Cruise Vessel

Sir Winston, a 116 x 30 ft. (35.4 x 9.1 m) dinner/cruise vessel, was recently delivered by Marine Builders, Inc., Utica, Ind. To Winston Knauss. Designed by naval architects DeJong & Lebet, Inc., Sir Winston is the fourth in a



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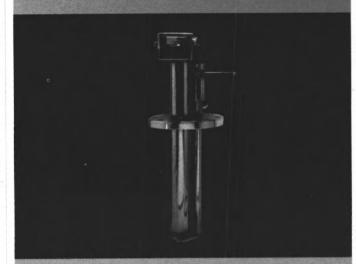
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series of vessels; the previous three have been converted to OSVs.

Passenger capacity is 400 for protected routes and 300-350 for partially protected routes. Crew capacity is 20.

The vessel features five levels, with 3,500 sq. ft. of enclosed passenger space, 1,900 sq. ft. of covered open deck and 1,900 sq. ft. of open sun deck on the fourth deck. The main deck features a 400 sq. ft. galley, and enclosed passenger lounge. The second deck is the dining room, and the third deck has a full-width pilothouse, as well as open bar and covered deck.

Sir Winston is powered by a pair of Cummins 6CTA engines developing 300 hp @ 2,500 rpm, with ZF IRM301-A2 gears. Electrical power is provided by a pair of 95 kW Cummins 6BTA generator sets. The 150 hp bowthruster is powered by a Cummins 4BT. Circle 111 on Reader Service Card

Batservice Holding Delivers Catamaran



Westamaran 4200 Mirage was delivered to the owners Strintzis Lines, based in Pireaus, Greece, to sail in Greek waters. This is the first Westamaran built Batservice Holding A/S, and is the largest catamaran built at the yard. The 137.8 ft. (42 m) vessel has a 386 passenger capacity. The main engines are two MTU 16V 396 TE74L at 2,000 kW and two MTU 12V396 TE74L at 1,500 kW. The vessel is also equipped with a motion dampening system from Maritime Dynamics Inc., including T-foils and flaps.

Circle 112 on Reader Service Card

FBM Marine Delivers Athina 2004



FBM Marine Ltd.. has announced Athina 2004 has entered service in Greek waters. The 147.6 ft. (45 m) luxury TriCat, built for Goutos Lines, operates two round trips per day. The vessel, which carries 375 passengers, has service speeds of more than 45 knots. It is powered by two Caterpillar Solar Taurus 60M gas turbine engines, which deliver more than 9,000 kW through KaMeWa water-jets.

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SeaArk Delivers Patrol Vesse

SeaArk Marine, Inc. delivered a 48 ft. (14.6 m) Dauntless Class

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Patrol Boat to the U.S. Army Kawajalein Atoll, in Marshall Islands. With a 15 ft. (4.6 m) beam, and a 4.5 ft. (1.6 m) draft, the vessel is powered by a pair of 8V92TA Detroit Diesels. Maximum speed is 35 mph. Special equipment onboard includes crew cabin with galley and head; dive/rescue platform; 800-gal. fuel tank; 48,000 BRU air conditioning; emergency blue strobe light and 12 kW water cooled diesel generator.

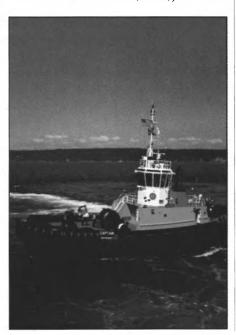
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Nichols Delivers Second Harbor Tug



Nichols Brothers Boat Builders delivered *Captain*, the second 105 ft. harbor tug in a series of six, to Vessel Management Services, Inc. (VMS) a vessel construction subsidiary of Crowley Maritime Corporation.

Designed by VMS and Guido Perla & Associates (GPA), Seattle



September, 1998

naval architects, the hulls utilize the patented Voith Schneider hull shape. GPA also provided detailed engineering services that underlie the modular shipbuilding and zone outfitting techniques used by Nichols Brothers.

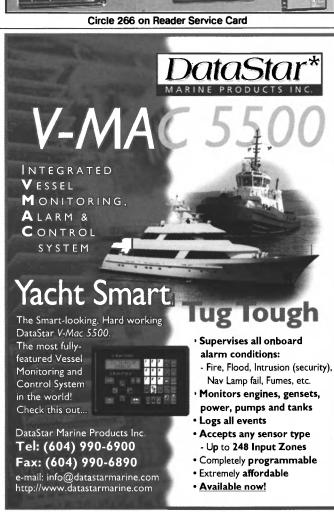
Captain, measuring 105 x 36 x

15 ft. (32 x 11 x 4.6 m), uses Caterpillar 3516B engines, which drive Voith Schneider 28G/210 cycloidal units through Falk reduction gears. Engines provide 4,800 hp for 107,500 lbs. of forward bolllard pull, and a top speed of 14.3 knots. Electricity is supplied by

CAT 3304 diesels that deliver 105 kW at 1,800 rpm.

Deck equipment includes three Markey winches, Amsteel-blue capstans, North American deck crane, Schuyler loop fendering and a Switlick six-man liferaft.







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Renaissance Goes Upscale With R.One

French built-series features proven diesel-electric drive with Wärtsilä powerplants

By David Tinsley, technical editor

Fort Lauderdale-based Renaissance Cruises has realized the first phase of a considerable fleet development program geared to the U.S. passenger market, with the delivery in France of the 342-stateroom *R.One*.

Her name may be minimalist, but the ship's interiors are characterized by a tasteful opulence and abundant variety reflecting a carefully considered commercial strategy.

While the distinctly British feel to the public rooms, and the elegant tone of the passenger spaces throughout reflects the work of a London-based design studio, the vessel is distinguished overall as a specific market-targeted product conceived by **Richard Kirby**-headed Renaissance.

The 30,277-gt *R.One* signals a new era for a company that has hitherto built its reputation on a fleet of 114-passenger yacht-type cruise ships, typically offering exotic itineraries in southeast Asia, the Indian Ocean, the

Mediterranean and the Baltic. The Liberian-flag *R.One* is homeported in Piraeus, such that flights to and from the USA and pre- and post-cruise hotel stays in Greece and Turkey form an integral part of the Greek island and Eastern Mediterranean cruise vacations she offers.

On the basis of a double-occupancy, 684-passenger complement, the crew-to-passenger ratio is nearly one-to-two, while the passenger space ratio (PSR), a factor of the vessel's enclosed volume, rates among the largest in the industry for a ship of her size.

Almost 70 percent of all staterooms and suites incorporate private balconies, and 93 percent have sea views, in line with the increasing expectations of clients. Renaissance has boldly designated the entire ship a non-smoking area, as one outcome of its thorough market research into preferences as well as tastes and aspirations six luxury vessels from Chantiers de l'Atlantique at Nazaire, St. which holds options on two further ships of the class. Such is the scale of its expansion plans h a Renaissance is already contemplating larger

ninth and tenth vessels. The company retains three of its original class of eight Italian-built yacht-type cruise ships, and forward bookings will carry this remaining trio into 2000 at least.

The refined lines and distinctive profile of the seminal Renaissance vessel are manifestations of the company's plan to strengthen its position in the upper segment of the cruise market. She has been assigned to a program of 10-day cruises in the Aegean and Eastern

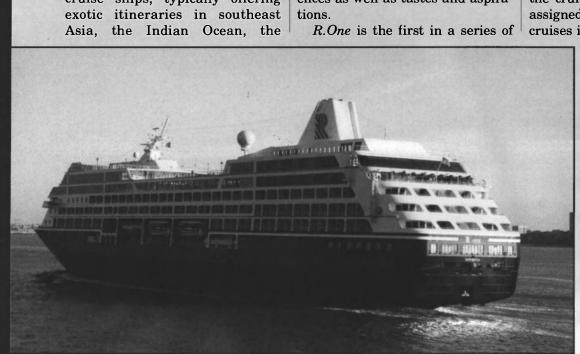
Mediterranean, working out of Piraeus to Israel, Cyprus, Rhodes, Kusadasi and Crete.

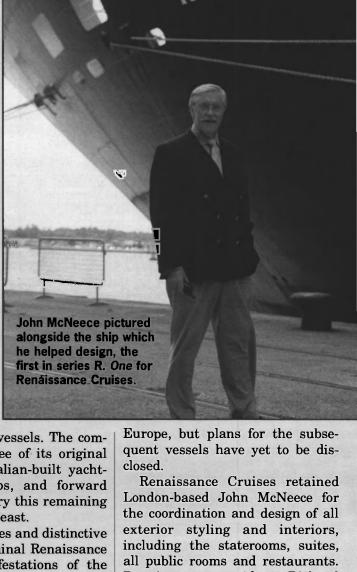
Due for delivery in November this year, second-of-class R.Two has also been earmarked for operations in the same region, while follow-on sisters R.Three R.Four will be homeported in Tahiti for 10-day cruises French in Polynesia and the South Pacific. It is understood that the company is provisionally considering deploying the fifth newbuild in Mediterranean

Renaissance Cruises retained London-based John McNeece for the coordination and design of all exterior styling and interiors, including the staterooms, suites, all public rooms and restaurants. Renaissance president Richard Kirby said "To achieve the timeless, classical elegance and comfortable functionality we wanted for these new ships, we have taken the unusual step of choosing one designer for the entire vessel, rather than selecting a variety of designers as is usual with a large, new cruise ship."

McNeece said "It was a very exciting opportunity to design a ship exclusively for the U.S. market. The vessels provide a classic, high quality look for the U.S. market and bring a measure of character, style and elegance reminiscent of the classic liners, subtly blended with the best in leading-edge technology."

"She is very much a traditional looking ship in which we have created a complete, seamless feel, unlike other new ships coming into service," he added.





CRUISE SHIP FOCUS

The onboard style and atmosphere is reminiscent variously of a London gentleman's club and an English country house, with the exception of the Sports Bar and Grill on Decks 10 and 11, respectively, which are unambiguously American.

The degree of choice conferred by the variety of public spaces and restaurants is one of the key features of the class, which are claimed to be the first luxury ships designed to provide multiple, casual dining options. *R.One* incorporates a full service spa and fitness center staffed with personal trainers and including the only outdoor thalassotherapy whirlpool afloat and reportedly also the first fog shower, a form of steam shower, on any ship.

The staterooms are located over five decks. Each is equipped with a state-of-the-art, interactive TV system, which not only offers sports and movie channels, plus live CNN coverage, but also the facility to order room service 24 hours-a-day, make dinner reservations, payper-view events, sign up for shore excursions,

purchase items from the vessel's shops, and settle onboard accounts.

In a technical context, *R.One* provides a new reference for the diesel-electric mode, encapsulating French electrical engineering systems and Finnish-developed, well-proven diesel machinery.

Although Wartsila NSD has since introduced a new 320 mmbore medium-speed series, the longer-stroke Wartsila 32, the prime movers ordered for the *R.One* are of the well-proven Vasa 32 design in its environmentally-attuned Low NOx version.

The selection of diesel machinery included both headroom and length considerations, the latter reflecting transverse bulkhead positioning.

Each of the resiliently-mounted Wartsila diesels has a rating of 4,860-kW at 720-rpm, and operates on 380 cSt heavy fuel oil. The bank of four engines drives a corresponding number of 4.6-

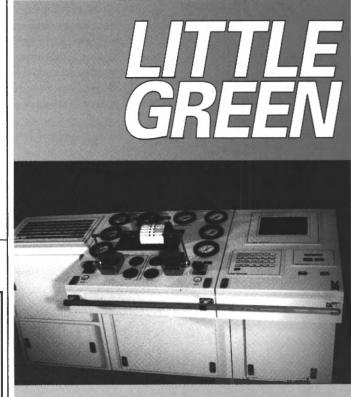
MW GEC Alstom alternators located immediately beyond the bulkhead separating the diesel engine compartment from the generator propulsion room. Energy is fed to the pair of Cegelec 6.75-MW propulsion motors positioned forward of the main generators, and acting on the long shaftlines turning the twin propellers.

The converter rooms and main switchboard are accommodated at an intermediate level in the generator propulsion room.

The maximum speed of 18 knots required to fulfill the vessel's regular cruising schedule necessitates only three main generators to be run. The added dimension to the system conferred by the fourth primary genset offers the scope, if required, to make transits at 21 knots, while also providing all requisite power for air-conditioning and ship's services.

Having just two of the units engaged, feeding energy to both propulsion motors and thereby turning both shafts, gives an 11-knot capability in good weather.

Shipboard equipment specialist MacGregor was contracted as the turnkey supplier for the provision stores and associated reefer plant for the R.One, in a project which drew on its partnership agreement with refrigeration engineering firm York International. Designed to U.S. Public Health standards, the vessel's nine provision rooms are a mix of positive and negative



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temperature spaces, and incorporate a stainless steel floor cover-

Utilizing environmentallyfriendly R507 refrigerant, the two York condensers each comprise two hermetic reciprocating compressors. Under the turnkey contract,

MacGregor guaranteed the maintenance of appropriate temperatures in the stores, and was responsible for the planning, delivery and also the installation of all elements, including piping. The plant in the third to sixth vessels in the series will differ in that three of the reefer store rooms will be slightly larger than in R.One.

MacGregor has also provided the outfit of four passenger elevators, each designed for a maximum of 10 occupants, and four service units comprising six- and 13-person lifts. Sizes have been increased

for the equipment in the subsequent two pairs of Renaissance newbuilds.

R.One Main Particulars

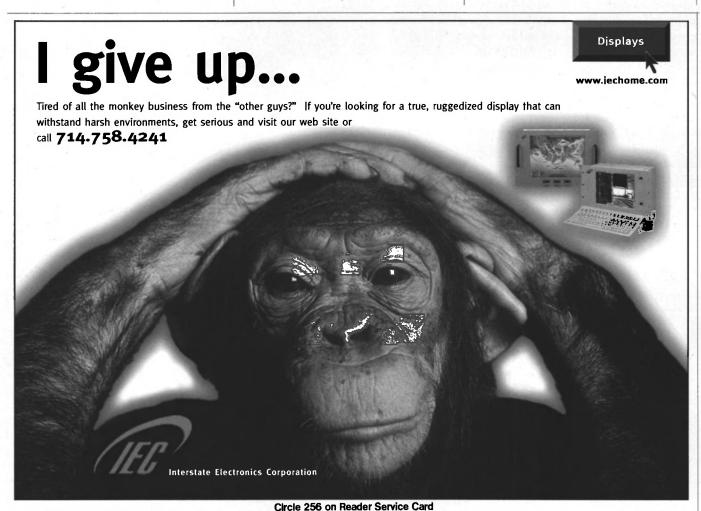
Length	.593.7 ft (180.9 m)
Beam	
Maximum draught	
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Net measurement	
Passenger cabins	
Passenger capacity(double occup	ancy)684
Passenger capacity(certificated)	
Crew	
Propulsion system	Diesel-electric
Main generators	
Propulsion motors	
Cruising speed	
Hag	
Homeport	
Class	

NQEA Delivers Low Wash Ferries For Bora Bora

Shipbuilder, NQEA Australia Ptv. Ltd. has delivered two of its 'River Runner' low wash catamaran ferries to Bora Bora Navettes in French Polynesia. The two RR150 model ferries will be used to transport passengers between the island of Bora Bora and the airport which is located on the edge of the lagoon.

According to NQEA, "Bora Bora Navettes came to NQEA seeking a reliable low wash high speed ferry which emphasized the spectacular visual appeal of the area. The standard River Runner 150 was offered and modified to accommodate an upper viewing deck and larger windows. The vessel package was further enhanced by the addition of an NQEA designed and built baggage handling system, berthing pontoon and gangways, fully integrated and positioned on site to suit the River Runners."

Each vessel is capable of carrying up to 115 passengers plus their baggage. The propulsion consists system of Caterpillar 3196 diesels, driving conventional propellers via Twin Disc gear boxes. A 32 kW Lugger generator set provides power for the air-conditioning and AC electric services. During trials the vessels satisfied all the speed and wash contract conditions, achieving a speed of 25 knots with more than 11 tons of deadweight





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Status Of OPA 90 Phase-Outs On U.S.-Flag Tankers Of Over 10,000 DWT

irt Dimopoulos and Susan Geiger

he Oil Pollution Act of 1990 'A 90) was passed in the wake he Exxon Valdez oil spill. The tute addresses oil pollution and ablishes liability for the disrge or substantial threat of a charge of oil to U.S. navigable ters and shorelines. OPA 90 Iresses the wide-ranging probis associated with preventing, ponding to, and paying for oil lution. It does so by creating a prevention, nprehensive ponse, liability, and compensan regime for dealing with vessel 1 facility-caused oil pollution in 3. territorial waters and the)-mile Exclusive Economic Zone S Waters)

OPA 90 increases federal overht of oil transportation while
oviding for greater environmensafeguards. OPA 90 establishes
indards for vessel construction,
eates requirements governing
w licensing and manning; mantes contingency planning;
hances federal response capabil; broadens enforcement authoriincreases penalties; creates a
w research and development
ogram; increases potential lialities; and significantly increases
incial responsibility.

The most far reaching OPA 90 quirement in terms of macroecomic effects stems from Section 15 of OPA 90 which sets forth a andatory regime aimed at reducg the number of oil spill incients involving single-hull tank essels through mandating doue-hulls. Single-hull tank vessels 5,000 gt or more are prohibited om operating in U.S. Waters ter specified dates determined by ne age of the vessel. Vessels with puble bottoms or double sides are igible to trade in U.S. Waters for period of five years later than an quivalent single-hull vessel. 'All ngle-hull vessels over 5,000 gt re prohibited from trading in U.S. Vaters after 2015. Single-hull essels can use U.S. deepwater orts or designated lightering reas until 2015.

'As statistics from the Maritime administration indicate, several J.S. companies operating Jones act tankers will feel the effect of Section 4115 during the next five o 10 years as they transition to

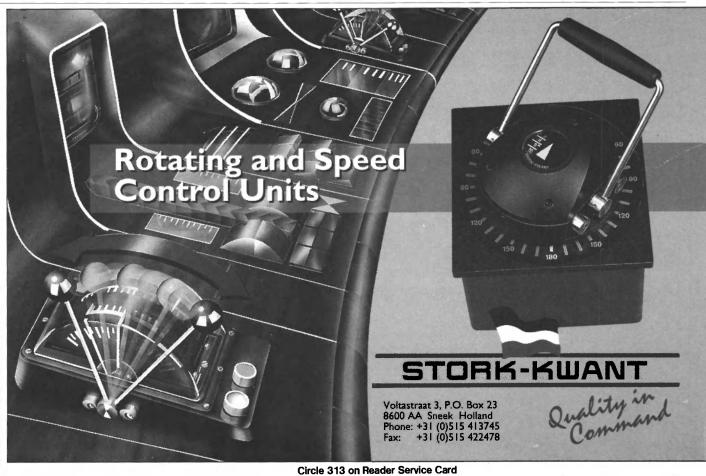
double-hulls. The table and chart below indicates that a substantial percentage of the anticipated U.S.flag tank phase-outs will occur

from 1999-2008. In the year 2000 alone, 14 vessels representing 1,221,886 dwt. will be eliminated from U.S. trade. Single hull ves-

sels scheduled for special survey shortly before their OPA 90 exit date, are likely to exit the trade at the time of their special survey in



Circle 281 on Reader Service Card



LEGAL UPDATE

order to avoid a substantial expense that will likely not be recovered in a short period of time. The phase-out of these vessels could, therefore, occur even earlier than noted in the chart to the right.

An additional 18 vessels com-

prising 902,214 dwt. are presently within the U.S.-flag double-hull fleet. These include four retrofitted vessels operated by American Heavylift and the Double Eagle vessel, American Progress, built for Eletson Holdings then sold to Mobil Oil Corporation.1

U.S. Flag Vessel Phase Out Projections					
YEAR	NUMBER OF VESSELS	TOTAL DWT			
1999-2003	38				
2004-2008					
2009-2015	18				
TOTALS	83 Vessels	6,533,911 dwt.			



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Outstanding deliveries remain for four Double Eagles representin 227,200 dwt. and two 125,000 dwtank vessels.2

Presently, the gap betwee Jones Act tankers expected to g out of service versus those antici pated staying in the U.S. trad represents about 60 vessels or in excess of 5,000,000 dwt. carryin capacity. To an extent, that gal will be filled by alternative means the increased use of double hul tank barges, integrated tug/barge units, product carriers fron refineries at the point of source and pipelines (although the impac of pipelines on the environmen may limit their ability to increase capacity.) The need for deep draf Jones Act replacement tonnage still exists. Therefore, it is crucial that proposed legislation implementing the OECD Shipbuilding Agreement recognize the importance Jones Act vessels have to the U.S. shipbuilding base and that the U.S. maintain and bolster incentives such as the Title XI program and Capital Construction Fund. Both regimes are vital to continued private investment in such vessels.

1 Originally Eletson Holdings (a.k.a. Fleves Shipping Corporation) ordered four product tankers at Newport News Shipbuilding in additional to an order for five Double Eagles placed by Hvide Van Ommeren tankers I-V L.L.C.

2 The 125,000 dwt. vessels were ordered by ARCO Marine at Avondale Industries shipyard in Louisiana.

U.S. House Passes Ocean Shipping Reform Act

The House of Representatives passed a bill aimed at partially deregulating the ocean freight business, but it must return to the Senate after removal of a provision on merchant marine death benefits. With the Senate already out on its summer recess, a new vote will have to wait until September.

The Ocean Shipping Reform Act would allow carriers to negotiate confidential deals with individual shippers, which would break current cartel pricing by groups of ocean lines known as conferences.

Although the bill was approved by the Senate in April, it must return because Arizona ican Bob Stump, chairman House Veterans Affairs ittee, managed to remove a ion giving a group of World I merchant mariners veterurial and death benefits.

titrust immunity for the conces to set freight rates is pred under the bill passed by the se, but the requirement to file tariffs with the Federal itime Commission (FMC) is sinated. Carriers would have sublish standard freight rates, confidential contracts could be seen by other shipping lines.

AC Looks Into Shipper scrimination Charges

The U.S. Federal Maritime ommission (FMC) is reportedly avestigating allegations that thina discriminates against U.S. hipping firms. The FMC warned hat sanctions could be imposed if alleged barriers at Chinese ports are not lifted.

In a June letter to the FMC, Senator Hollings reportedly complained that the state-owned China Ocean Shipping Company "operates and competes freely and openly in the United States while our carriers face costly, anti-competitive restrictions in China."

U.S. firms need special approval to re-deploy vessels from one Chinese port to another, are limited in the number and location of branch offices they may open, and face restrictions on ground transport to inland customers, he said.

London Club Issues Warning On ISM Certification

The London P&I Club has warned that ISM certification, if not properly implemented and monitored, can be little more than a worthless paper exercise. The Club notes that there have been reported incidents of vessels — not entered with the London Club and with ISM code certificates — being detained in port as a result of serious safety deficiencies.

In one case, these deficiencies led to port state control inspectors checking the ship's condition against that recorded in the paperwork of the safety management system (SMS). The result was that the ship bore little or no resemblance to the reported condition. The auditing body for the ISM code and class were called in and not only did the physical defects have to be rectified, but also the non-

conformities with the SMS.

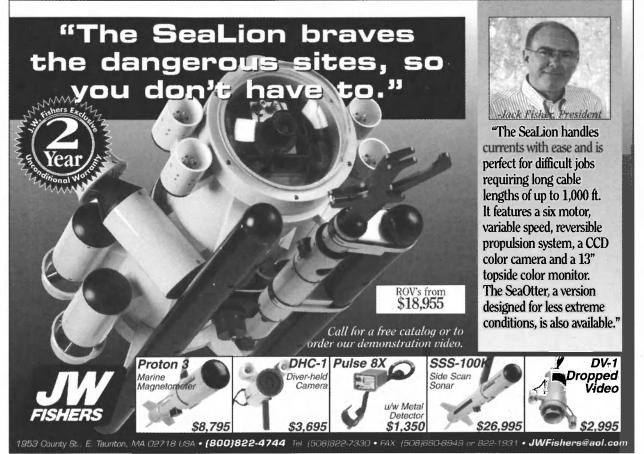
MMS Sets Rules For Offshore Spill Rules

The U.S. Interior Department issued final rules spelling out how offshore oil producers must pay for clean-up and damage caused by spills. The rules issued by the Minerals Management Service (MMS) apply to certain crude oil wells, production platforms, and pipelines located off the U.S. coastline. The rules also include procedures for filing claims for spill-related compensation. The new regulation becomes effective in

October. MMS said it created a separate panel to review the issue of financial responsibility for spills occurring in state waters. The agency also scheduled workshops to explain the new rules to the industry in Houston on Sept. 1, New Orleans on Sept. 15 and California on Sept. 24.



Circle 215 on Reader Service Card



MARINE FINANCE

(Continued from page 19)

May 1997, is nearing completion at the Cochin yard.

The tanker is expected to carry 94,250 tons of crude oil. It is the first vessel of its kind to be built in India.

Circle 101 on Reader Service Card

Krupp Supplies Self-Unloading Equipment

Krupp Fordertechnik GmbH has received an order to supply the necessary handling equipment for two German-built self-unloading ships. With a capacity of 10,000 dwt each, the ships are designed to carry coal to customers who do not have the requisite port facilities and ship unloaders.

Using the Krupp system of three conveyor belts, coal is carried first from the cargo hold to the ship's bow at a rate of up t tons per hour. A second condect to the conveys the coal to a which can be pivoted, elevat lowered. The third belt pass coal along the boom to the port or storage facilities on l.

Another of l Fordertechnik's self-unlo systems is designed for ports strongly fluctuating water Is such as the Rhine river. The tem of conveyor belts and boc attached to a pontoon, allo ships to approach the pontoon have their cargo unloaded onto pier for transport.

ASD Wins Contract to Refi NOAA Miller Freeman

Alaska Ship and Drydock, I. (ASD) of Ketchikan, Ak., has wor contract worth \$5.9 million for t. repair of the NOAA vessel Mill Freeman. The primary intent the six-month overhaul is to obtai an ABS Hull and Machiner Classification, as well as an inter national Load Line assignment Work will include installation of two new auxiliary engines, overhaul and conversion of the main engine, a new propulsion and shaft system, interior and exterior hull painting, and major electrical and machinery modifications. Doug Ward, director of Business Development for ASD, considers that the "conversion of the Miller Freeman to a load line vessel will accelerate our effots to make Ketchikan the premier marine support center for Alaska." This is reportedly the most complex ship repair project to be undertaken in the state.

Circle 102 on Reader Service Card

MacGregor Wins Repeat Cruise Ship Orders

MacGregor has been contracted to supply shipsets of elevators, provision stores and associated refrigeration plant for four 700passenger vessels recently ordered from Chantiers de l'Atlantique France by yard in Lauderdale-based Renaissance Cruises. MacGregor was selected to supply similar shipsets for the first two vessels in the series, ROne (profiled on page 24) and RTwo. The four passenger elevator cabins previously supplied were arranged for a maximum of 10 people — the new contract calls for an increase in size to accomodate 14.

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west Marine Signs -of-Intent

thwest Marine, Inc. (SWM) 1 Diego, Ca. has signed a let--intent to acquire Norfolk building & Drydock (NOR-'CO). The Norfolk, Va. ship ir facilities would then be ed to those SWM currently ates in San Diego, San Pedro, San Francisco, as well as eside in Texas. Annual reves will reportedly be boosted to irly \$400 million, with staff mbering approximately 4,000. /M has also announced the pointment of Vice Admiral exander J. Krekich as special sistant to the CEO, B. Edward wing.

vergreen Group Acquires talian Shipper

In a continuing move by the Italian government to privatize industries and companies, word out of Italy last month indicated that the Evergreen Group has agreed terms for the acquisition of Lloyd Triestino di Navigazione SpA, a shipping company which is currently part of the Italian stateowned group Soc Finanziaria Marittima Finmare SpA (Finmare).

Evergreen's acquisition of Lloyd Triestino has been approved by the Italian Government and the sale is expected to be finalized in September. Evergreen will retain the name of Lloyd Triestino.

Lloyd Triestino was established in 1836 and is headquartered in the port city of Trieste. Within the Finmare Group, it has concentrated on providing shipping services between the Mediterranean/North Europe and the Far East, Africa, the Middle East and Australia.

Including those operated in association with Evergreen, Lloyd Triestino markets eight container services. Its own vessel fleet contains seven ships, ranging from 1,555 to 2,987 TEU and with an average age of eight years.

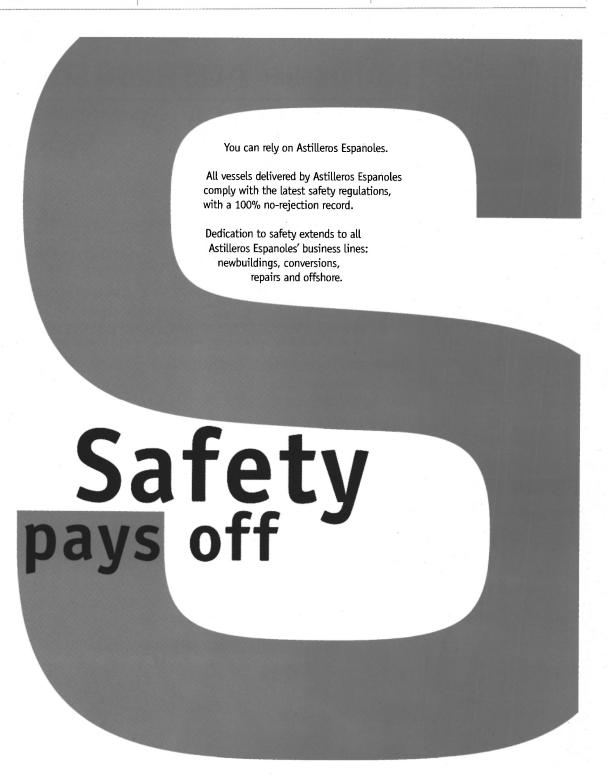
Evergreen has signed a 60-year concession agreement with Taranto Port Authority and will construct a two million TEU capacity common-user container facility.

Litton Wins Orders For Austal Fast Ferry Newbuilds

Litton Marine Systems has secured orders from Austal Ships Pty Ltd. to supply a complete suite of navigation, communication and control electronics for two 282 ft. (86 m) fast ferries under construction at the Western Australian shipyard Austal.

FCS Gets New Orders

Derecktor Shipyards has ordered a Nelson Bilge Boy Oily Water Separator from FCS for the ferry, currently under construction. The oily water separator meets the new U.S. Coast Guard requirement, calling for approved 15 ppm oily water separating equipment for processing of oily bilge slops on ocean going vessels of 400 gt and above but less than 10,000 gt excluding ships carrying ballast water in their fuel tanks.



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Circle 210 on Reader Service Card

MARINE FINANCE

Ballast Water Regulation Database Available

The role of ballast water in the transfer of new and potentially harmful aquatic organisms has become an increasing concern for many in the maritime community. the IMO's Since Marine Environment Protection

NY NY NY

Mak

MEDIESEL

Committee adopted voluntary guidelines in 1991, the industry's search for an appropriate solution to this problem has intensified.

In addition to the investigation of possible responses on the international scale, national maritime authorities have implemented a wide variety of regulations and restrictions on ballast water management. For a ship's master, already struggling daily to ensure his vessel's compliance with local law, the proliferation of ballast water management regulations only adds to his burden.

BIMCO's comprehensive database on national ballast water management regulations is now complete. Available only to BIMCO

members, the database detailed information on regulations on ballast wat agement and discharge of in more than 100 countridatabase also includes refe to international and regions

Circle 20 on Reader Service C





Marinette Marine launched the latest USCG Coas Buoy Tender dubbed Josh Appleby. The 175-ft. (53.3 m) sł is one of the most technological advanced buoy tenders in tl world. It features a Z-Driv Propulsion System designed t give it unparalleled maneuverabi ity. Joshua Appleby was primaril designed to serve as a vessel to install and maintain navigationa aids. Along with protecting the marine environment, the buoy tender is also equipped to respond to search and rescue operations.

The advanced electronic navigation and positioning system featured within the vessel provide the USCG with outstanding control.

Circle 21 on Reader Service Card

Norwegian Navy Explores New Ship Procurement

Nine shipyards and 10 naval administrations are joining together to establish and further develop joint technical regulations for naval vessels. A committee has been formed under the leadership of DnV, with the support of the Royal Norwegian Navy Material Command (SFK).

The new regulations will be based on the Royal Norwegian Navy's own technical rules for naval vessels and DnV's rules for fast ferries. The completed set of rules will be published by DnV next summer. SFK will use the new regulations in the design and building of new frigates for the Royal Norwegian Navy. The aim of the new rules is, among other things, to utilize the improvement in efficiency and technological developments that have taken place in civil shipbuilding.



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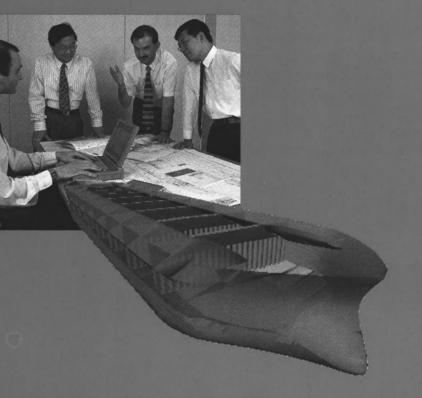
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German Maritime Review

Transitioning To The New World Order

A historic maritime power, German shipbuilders, repairers and marine equipment suppliers deftly handle cut-throat competition, price pressures and European integration. — by Greg Trauthwein

German shipbuilders and marine equipment suppliers have built a strong reputation in international markets using engineering excellence as its foundation. The German market has shown an amazing resilience in the face of incredible competitive pressures from the Far East and from the traditional maritime powers within Europe itself. While shipbuilding numbers in terms of gross tonnage built have consistently dropped in the last 20 years, Germany has staunchly held its position among the world's elite, building 4.7 percent of the world's shipbuilding tonnage in 1996, ranking it third among world leaders.

In addition, the traditional powers of the West have weathered the sometimes difficult assimilation of new colleagues/competitors from the East. Also, faced with quality vs. quantity and cost, the German manufacturers have unflinchingly maintained the highest engineering standard in the quest to provide long-term maritime solutions which are still marketable, rather than cave in to pressures to "cut

corners" in an attempt to lower prices and increase market shares. Make no mistake, however, that this has not come without some pain. Germany, like many developing countries, has seen a radical change in the composition of its manufacturing base, with an increased emphasis toward downsizing and outsourcing. Despite all of the ups and downs of this notoriously cyclical market, Germany has maintained an impressive market share of highly-valued, highly complex vessels. It has done so, primarily, through the strong infrastructure of its countrymen and the world-wide maritime community as a whole, with relationships among shipowners, designers, suppliers and builders laying the groundwork for the ability to develop, design and produce highly specialized high-technology ships.

On the eve of arguably the world's most important maritime event — SMM, which is held every other year in Hamburg — MR/EN offers a closer look at some of Germany's top maritime players.

2 5 5

lding

erman shipbuilding marbe summed up quite simgh-tech, high-quality and ue. Forced by lower cost tors in the Far East to 1 the production of "simships, Germany's ships have generally concenon the design, development oduction of vessels such as x containerships, passenger s, chemical tankers and vessels.

enau Shipyard in Kiel ig more than 75 years of ence — is a good example of man yard which has adjusted the changing times, finding a Lindenau perous niche. tly delivered its latest in a line of modern, efficient and gical double hull tankers, iella Amoretti, to Italian er Marichem Europe S.r.l. The building was built under the chful eye of RINA, and is a new ign jointly developed by the pping company and the yard. dimensions of the ship are as

ngth, o.a	433 ft. (132 m)
	416 ft. (127 m)
readth, molded	
epth to main deck	40.5 ft. (12.35 m)
Iraft, design	
)WT at design draft	
GT	
Cargo tanks	
Cargo tank capacity	
Slop tanks	
Slop tank capacity	
Speed	15.4 knots (trail)
	14.4 knots (service)

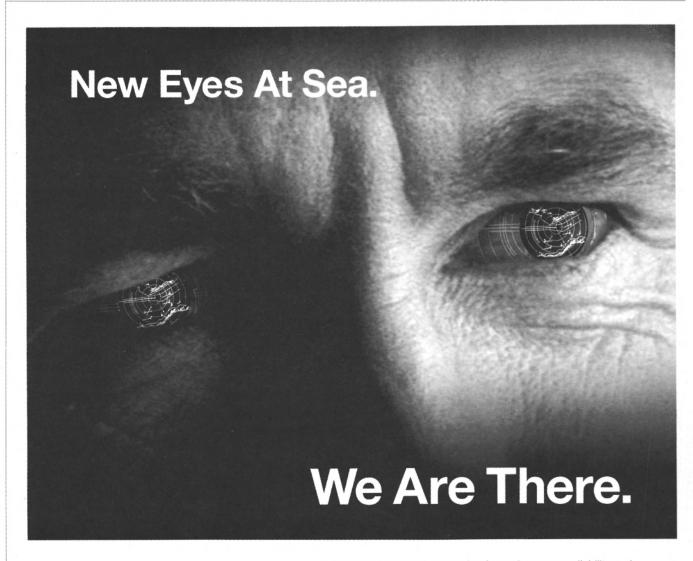
The ship offers an integrated argo, ballast and engine monitorng and control computer system with remote control and indication n color monitors in the wheelouse as well as in the engine and he cargo control room. All cargo numps are built of stainless steel nd have variable speed control, and simultaneous operation of all 6 cargo pumps is possible. The argo tanks are all coated with Sigma Phenguard epoxy, and all argo pipes and fittings in the argo tanks are of stainless steel. The vessel is powered to its 14.4

anot service speed by a MaK 8M is 2 C diesel engine, offering approximately 6,000 kW at 500 pm. Power is transferred to the variable pitch NiAlBr four-blade propeller via a reduction gear with ombined PTO/PTI and multi disk lutch couplings.

Meanwhile, a visit to the amaz-

ing Meyer Werft shipyard in Papenburg is a unique experience. Meyer Werft has served the maritime industry since 1795, producing approximately 700 ships since that time. Its covered building dock bursts from the Germany countryside in a most dominating

fashion, but the heart and soul of the yard's success is housed in the intricate organization found inside. The yard has built a considerable reputation for building high-quality cruise ships for the world's major lines, and its latest delivery seems to be a strong continuation of this billing. Superstar Leo left the covered building dock of Meyer Werft on July 11, and the 75,000 gt vessel was towed out to the fitting-out quay for final completion. Delivery of the vessel to Asian-based Star Cruise is scheduled for this month.



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SMM '98



Meko class warship from the German Frigate Consortium.

Superstar Leo is an 879-ft. (268-m) ship with a capacity for 2,800 passengers. Sixty percent of the ship's cabins are outside cabins, and 40 percent are fitted with a private balcony. It is reportedly the first cruise vessel of this size to feature a helicopter landing area, and to prove its dedication to serving passenger needs, the ship will have 1,000 crew members, or approximately 20 percent more than comparable ships. Other

amenities include: a public vilpoint on the bridge; an atriextending over six decks, with glass dome and glass-walled lift and a two-level lounge with searing for 1,000. Sisters Superstar Virgo is present under construction at the yar due for delivery this time new year. Lübeck-based Flender Wer has recently delivered newbuilding no. 664 dubbed Santa Federic to Hamburg-based shipowne



eter Offen. The vessel will ately enter service as P&O A Santiago following a lus-option-three year time with P&O Nedlloyd. The nership is the latest of the F-class Flender-2100 type, is a development of the ship-expertise in developing and ring ships of this type.

30,200-dwt ship measures 97.7 ft. (183.2 x 29.8 m) with oth of 51.2 ft. (15.6 m) and a ft. (11.5-m) draft and offers a d of 20 knots. The ship was t under the rules of manischer Lloyd and will sail er the German flag. The holds fitted with 40-ft. fixed cell des, and 2,169 containers can stowed in six tiers on deck and the cargo holds. The upper deck also equipped with 420 plugs for e transportation of reefer coniners.

The vessel is powered by a rosshead engine of the long stroke IAN B&W 6S 60MC design, rated 2,240 kW at 105 rpm, driving a P propeller.

Howaldtswerke-Kiel-based Deutsche Werft AG (HDW) founded in 1838 — has built a sterling reputation as an all-around shipyard, mixing next-generation hatchless containership development with navy submarine construction. The merchant construction program focuses on containerships up to 8,000 TEU, feeder ships, cruise liners, LNG tankers and other, specialty vessels. But perhaps the most interesting contract in years comes from the cruise side, as HDW was the yard chosen to make the mammoth Residensea a reality.

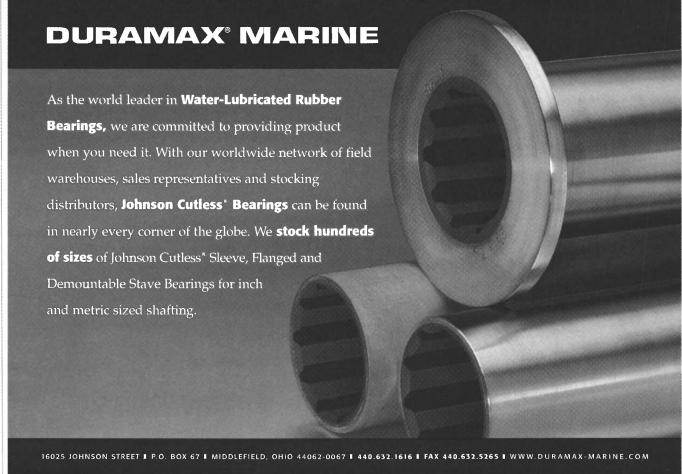
ResidenSea Ltd. (Bahamas) signed a letter-of-intent with HDW late last year for construction and delivery of the luxury vessel The World of ResidenSea. Costing in the neighborhood of \$500 million, The World of ResidenSea, if the contract is fully executed, will deliver a new concept to the cruise market, specifically the ownership of cabins at sea. At present, financing for the deal has not been fully arranged, but sources from the yard project these could be in place by the end of this month. The World of ResidenSea is the creation of the Norwegian Knut Kloster Jr.

Kvaerner Warnow Werft in Rostock-Warnemunde stands as a dual example of the far reaching arms of the Kvaerner empire and the power of the German market. Built from the ground up several years ago, the facility stands as one of the more efficient, wisely designed yards in the world.

Recently, Kvaerner secured a drilling rig contract for the

(Continued on page 42)





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German Marine Equipment Manufacturers As Driving Force In Technology And Cost Efficiency

by Hauke Viktor Schlegel, Director, VDMA-German Marine and Offshore Equipment Industries

Marine equipment suppliers account for over 70 percent of exhibitors at the SMM and are thus easily the largest group. This

high share of 70 percent also closely corresponds to the share that component makers contribute to the value of a ship.

The significance of German marine equipment suppliers in the shipbuilding sector is clearly reflected in their presence in over-

whelming numbers at the SMM, as well as in their enormous product range, encompassing as it does engines, gears, propellers, deck machines, pumps and valves and electronic, navigation and communication equipment. This wide range of products,



VDM

components and systems will o more be fully represented at SMM, which will again dem strate the vital contribution maby marine equipment suppliers shipbuilding in value terms, as particularly also with respect innovations designed to enhanship operating reliability, cost-eff ciency and environment compatibility.

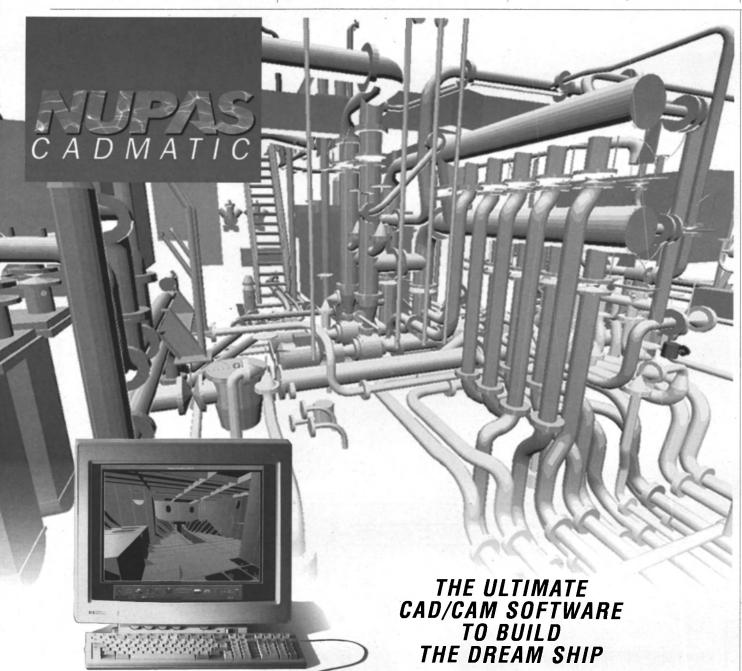
There are about 400 marine equipment suppliers in Germany.

German marine equipment manufacturers are confronted with ever more demanding requirements in the world market. Their customers, shipyards and, last but by no means least, shipping lines as operators of the delivered systems, are increasing requiring bout system expertise and better after-sales service from their suppliers.

The world market expects German companies to develop and provide high-tech specialities at acceptable prices-which in practice means nothing other than tailormade suits for the price of off-thepeg garments. When designing their range of technically sophisticated equipment, suppliers must obviously cooperate closely with shippards and shipping lines. The German marine equipment manufacturers, which are mainly medium-sized companies, have faced up to these increasing requirements and with their usual versatility are confronting the new and often far from straightforward challenges of the world market.

A conspicuous trend affecting the German suppliers is the increasing demand for systems and techniques rather than standalone components.

Customers require system capability and system integration over and beyond the mere development



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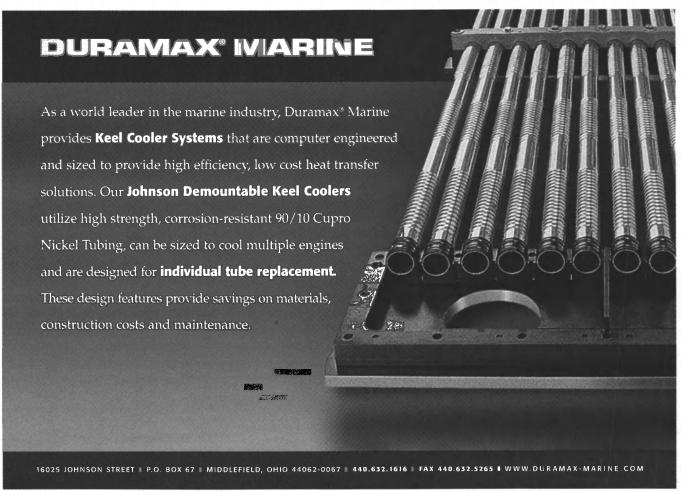
98

or-made high-tech products. epresents an additional chaland opportunity for marine ment manufacturers, most of are medium-sized companies. other factor adding to the signce of component makers in uilding is the increasing teny of shipyards to reduce their e of in-house production.

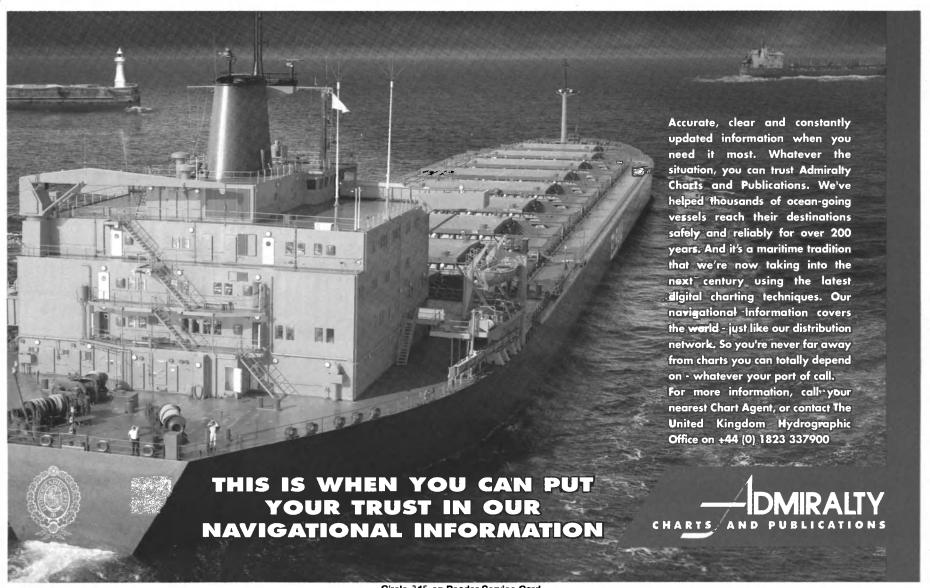
he traditional customer-supplier tionship within the supply chain ping line-shipyard-supplier is ving in the direction of cooperation a partnership basis. This means particular involving the system plier at a very early project phase a ship newbuilding to transfer to it e job of developing, designing and livering entire modules.

This relatively complex logistics ocess-which is also, incidentally, a cal point of the EU promotion proams-will also be promoted at SMM

There are around 400 mainly nedium-sized marine equipment suppliers in Germany, employing a total staff of about 70,000. For some years exports have accounted for a stable approximately 60 percent of



Circle 232 on Reader Service Card



German Marine Equipment Manufacturers As Driving Force In Technology And Cost Efficiency

sales, with about 40 percent going to EU countries and 28 percent to Asia. The world market share of German marine equipment suppliers is well above 10 percent, putting them in second place behind Japan. Despite the healthy order situation, however, earnings remain unsatisfactory on account of low world market prices.

Apart from rationalizing, many companies have been compelled to

move some of their production activities aboard, mainly because of the cost advantages and, to an increasing degree,



the required local content marine equipment, since more more shipbuilding countries, ticularly in Asia, have I expanding their own compon sectors to save foreign excha and create local jobs.

German firms will maint their current technical mar leadership only by investing concerted R&D programs. developing problem-oriented proucts, German marine equipme suppliers have a vested interest an efficient German and Europea shipbuilding sector.

Three main trends can be identified in the marine equipment sector:

Firstly, marine equipment sup pliers will continue to be con cerned with further cost reductions in the next few years, generally in conjunction with shipyards and aiming at increased modularization and standardization.

Secondly, as already noted, system solutions involving various products rather than traditional component deliveries are becoming increasingly significant, which offers shipping lines and shipyards a new quality of service, all the way from initial system concept to spare parts deliveries.

This naturally represents a challenge, but also an opportunity for highly innovative German marine equipment manufacturers, which can make the most of their expertise in terms of qualification, project management and service standard.

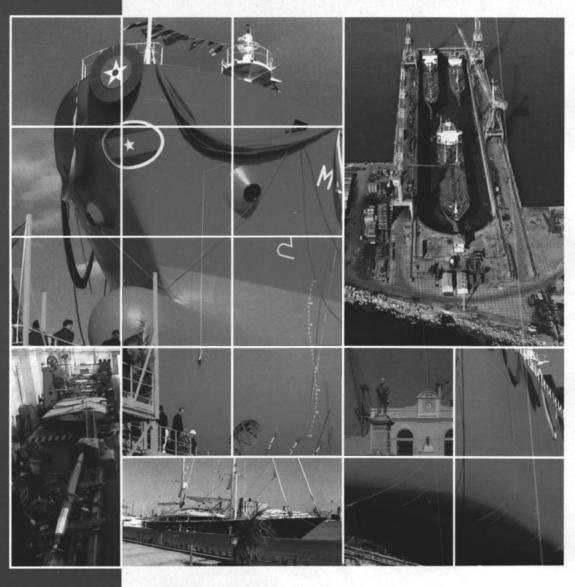
Every second German supplier now offers system solutions that go well beyond the company's own production program.

Thirdly, in the technical area, further reductions in operation costs are required, coupled with enhanced safety and environment compatibility.

The following are some examples to illustrate the trend:

In the diesel engine sector, the issue is the compromise between low fuel consumption levels and a further reduction in pollution

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emissions. Innovative diagnosis systems are used for the maintenance and monitoring of diesel engines, indicating via satellite links the maintenance work to be performed at the next port of call.

For rudder propellers as combined steering and drive systems, 20 percent increases in efficiency have been achieved with the latest innovations.

As far as navigation technology is concerned, increased system integration is leading to enhanced userfriendliness with more stringent ship operation safety requirements. Sophisticated software like the electronic nautical chart or global positioning system greatly enhance the efficiency of classic navigation. In this area, Germany has assumed a leadership role that has involved intensive and constructive cooperation between shipping lines, shipyards and suppliers, not to mention public authorities. Germany with its favorable infrastructure is a virtually ideal location for the development of technically sophisticated equipment such as these extremely complex complete system.

German marine equipment suppliers are successfully confronting the challenges of the world market, dominated as it is by increasing requirements for system expertise and service quality, as well as hightech specialities developed and supplied at prices acceptable in the The German marine market. equipment supplied at prices acceptable in the market. The German marine equipment suppliers are ready to meet these challenges and continue to be a driving force in ship's machinery technology and cost-efficiency.

See it first at SMM'98...

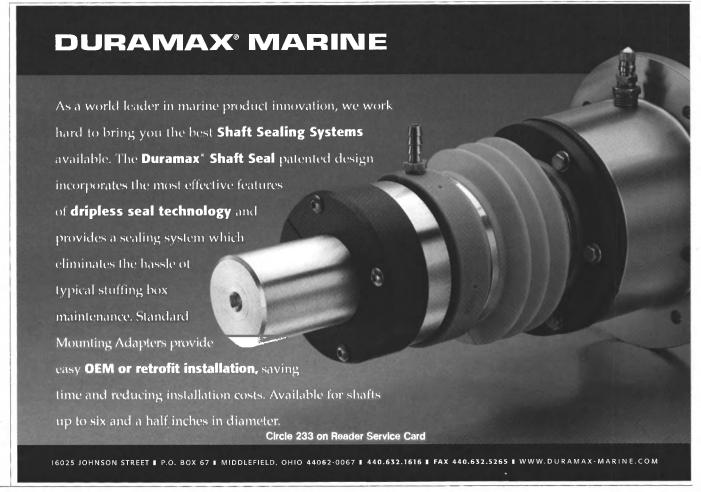
- MAN B&W will launch a new engine for the output range of 1,500 to 3,060 kW, designed as a medium-speed engine in the 720 to 800 rpm range for use as both generator and engine. It will be presented as a complete eight-cylinder generator set at SMM.
- Litton Marine Systems will unveil its new Decca BridgeMaster E marine radars in Hall 11.
- The first newbuilding of Fassmer's fast rescue boat FRIR 6.1 type started in July, and will be outfitted with a special davit system. The design has

been fully tested and approved.

- An entirely new generation of automation and navigation equipment and echosounders will be the focal point of the Kongsberg Maritime stand at SMM. The stand will feature a collage showing the wide range of products available from subsidiaries Kongsberg Norcontrol, Kongsberg Simrad and Simrad.
- Saab Marine Electronics and Scanjet Tankcleaning are introducting a new tank cleaning monitoring system dubbed WashTrac, which is

designed to enhance the tank cleaning operations onboard tankers of the future.

- Alfa Laval will exhibit in Hall 5 at this year's SMM, and on display will be its line of innovative products concerning separators, filters, heat exchangers, freshwater generators and pumps.
- Geislinger & Co. will exhibit several torsional vibration dampers and couplings.
- Permalight AG will present its line of photoluminescent safety products at SMM.





(Continued from page 37)

German yard. Stena Drilling Limited confirmed the award of a \$330 contract for the yard to build the drilling rig *Stena Don*.

"Confirmation of this contract represents an important breakthrough for the Kvaerner Warnow yard into the offshore market and is a milestone in the long-standing strategy to develop the yard into a leading shipyard for advanced tonnage," said **Martin Landtman** of Kvaerner Shipbuilding. The rig will be based on the Kvaerner

Flender Werft's Santa Federica.



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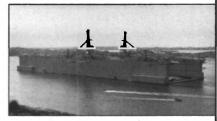
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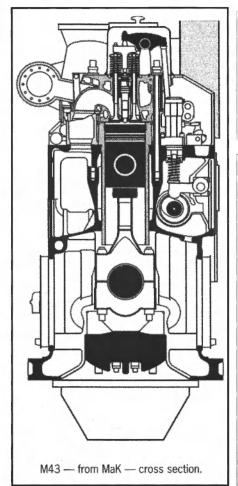
nental shelf as a well completion and maintenance vessel. Planned delivery is for 2001. Blohm + Voss, based in Hamburg, is perhaps the prime

Maritime CS30 design and will operate in the Norwegian conti-

Hamburg, is perhaps the prime example of German shipbuilding and repair resilience. The yard has carved several niches for itself in order to maintain itself over the past decade, including the development and advancement of new naval defense technologies. In addition, its repair and conversion division has filled the coffers with not only a strong revenue stream, but also an array of interesting and technically challenging jobs.

Meko, the intelligent design concept from the German Frigate Consortium consisting of Blohm + Voss, Thyssen and HDW, embodies the yard's continual efforts to capitalize on military markets. date there are 43 Meko frigates and corvettes operated by seven foreign navies, including three NATO partners. The success of the Meko class design perhaps lies in its adherence to simplicity, relying heavily on a modular construction technique. The class embraces the flexible installation of weapon, electronic and major ship's service systems in the form of standardized modules and standardized interfaces. The modularity — widely used in the construction of commercial ships — allows for the parallel construction of the ship platform on one side and the modular payload on the other. The process helps to save time and money, and provides a clear division of responsibility between the shipyard and the machinery, electronics and weapons suppliers. The modularity benefits do not stop at delivery, however, as the consortium touts the time and cost advantages throughout the vessel's life-cycle. With modularization in place, there is perhaps greater design flexibility in terms of upgrades and modernization, and time and cost can be saved when maintenance and repair is

Beyond ease of construction,



however, the Meko class embodies signatures of successful "next-generation" warships. Specifically, the Meko class is designed to significantly reduce the ship's signature. This is achieved primarily through optimal hull shaping, and can greatly enhance the vessel's ability to operate undetected.

Survivability was also key in the design of the class, and steps taken to ensure the ships are able to withstand damage yet remain operational include the compartmental arrangement of the monitoring and control system, the ventilation system, the fire fighting system and the power distribution system.

Supply & Demand

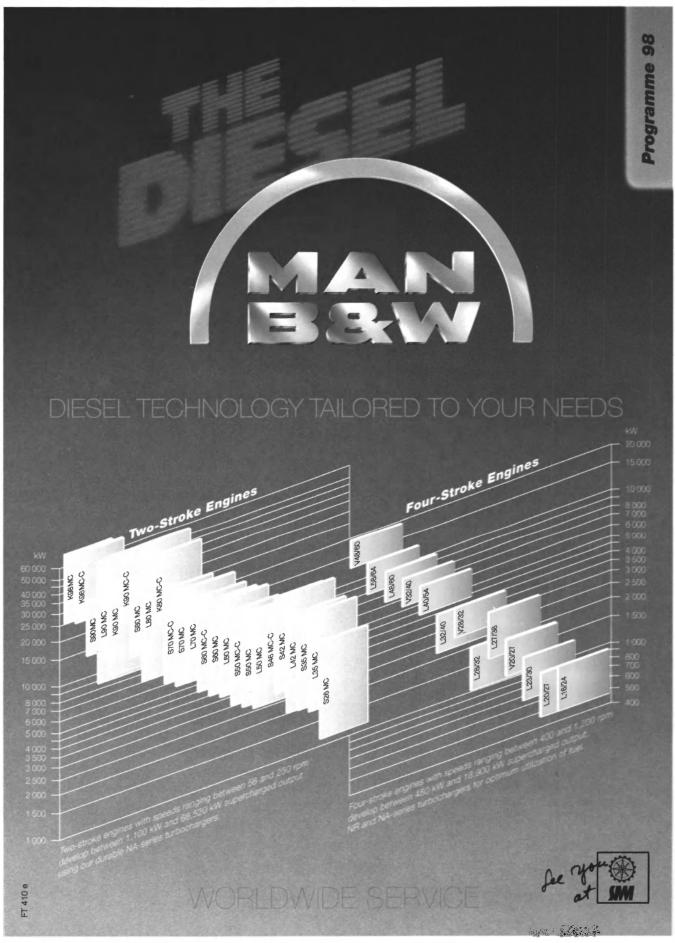
The quality of German machinery in and out of the ship supply realm are well documented and need no additional accolades. The interesting developments of the German ship equipment side lies in the ability of German manufacturers to maintain the highest of quality standards in a market where price pressures are so tremendous, and in light of a changing industrial landscape which leaves it impossible to maintain previous decade worker levels and profitability at the same time. Germany's engine makers notably MAN B&W, MaK, MTU -have continued towards producing reliable, energy efficient, cost effective and environmentally sound units while streamlining the number of components and maintenance complexity.

MaK will showcase its new M43 engine at SMM, a unit weighing in at 85 tons. With this diesel engine,

the company, which belongs to U.S. group Caterpillar now, is launching the fourth series of the new generation of long-stroke engines on the market. All variants from six to nine cylinders are offered, thereby linking the range with the M32 series. The V config-

uration in 12 and 18-cylinder models provide output from 10,800 to 16,200 kW. And the series meets IMO NOx reduction via a high compression ratio and corresponding sparking pressure, combined with low fuel consumption.

MAN B&W is also using SMM



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'98 to launch a new engine for the output range of 1,500 to 3,060 kW, designed as a medium-speed engine in the 720 to 800 rpm range for use as both generator and engine. It will be presented as a complete eight-cylinder generator set at SMM.

Siemens is a true global supplier of a variety of engineered solutions to the maritime markets. Siemens is a complete outfitter which combines single pieces of equipment into an overall system, and by analyzing interfaces and removing weak points, makes it more compatible and reliable. The key to the company's success is in the depth and experience it offers on the electrical and electronics products side, as well as its depth of technical experience in and out of the maritime market. The company can supply most any technological shipboard need, including: systems allowing for unattended engine room operation; power distribution; drives; power generation and conversion; and marine electrical technology. The company's diesel-electric propulsion systems are designed for technical and operational superiority, and the Simar Drive system is capable of delivering impressive returns in terms of economy, price and performance.

Another well-tested German maritime solution emanated many years ago from Voith Schneider Marine Technology. The company's success with its unique propulsion units has and continues to be driven largely by the steadily improving awareness of the need for higher safety of navigation in the world's waterways, said Eli Shaprut of Voith Schneider America Inc. Shaprut also cites the fear of the mounting costs associated with accidents (and accident insurance) as a driving force in the continual improvement of the cycloidal Voith Schneider Propulsion System.

German marine suppliers have been, much like their colleagues around the globe, under tremendous pressure to reduce price while maintaining quality.

ZF Marine Group's Peter Herring notes that the aggressive competition and the development of new products has helped ZF to continually upgrade and develop its own product line. The company, which anticipates a 10 percent leap in business this coming year, has a full-plate of recent developments including: BW 365, a 2,400 hp/2,300 rpm unit for pleasure craft and fast ferries; BW 361, a 1,500 hp 1,800 rpm unit for workboats; and BV 5300, a 10,000 hp 1,000 rpm unit for fast ferries.

Dieselmotorenwerk Rostock — which is a licensor of MAN B&W and Wärtsilä NSD — found that pressure for the yards has tremendously impacted pricing, but not so much, perhaps, as what a company representative terms as price dumping activities of South Korea.

Maerkisches Werk of Halver cites ever mounting competition and the overall development of the transportation market as a force in driving it to reach historic heights in terms of productivity. Supplying a wide array of propulsion components, MWH continues to succeed in increasing its capacities while keeping prices low.







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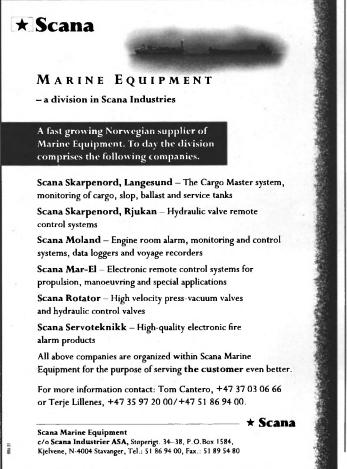
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Finland Tapped To Fill Prestigious "Partner" Role At SMM

organizers οf Shipbuilding, Machinery & Marine Technology International Trade Fair '98, in selecting Finland as the official Partner Country, have selected a group of shipbuilders and ship equipment suppliers which are well regarded for supplying the highest quality marine products and services.

Finland, with a population of little more than five million, enjoys a robust shipbuilding and equipment supply industry. Although tough competition in and out of Europe has forced, for example, the number of employees in the industry to drop from 18,000 in 1982 to 8,000 today, the country maintains several strongholds, including the building and outfitting of high-value tonnage such as LNG carriers and cruise ships.

In fact it has been Finland's proclivity for developing next-generation cruise ship technology that has the country running neck-andneck with the world's other top

the | cruise ship builders.

Most conversations regarding Finnish shipbuilding capability start and end with Kvaerner Masa-Yards, which has rapidly emerged as not only a leading shipbuilder but a primary driver of new technology on ships.

KMY builds cruise liners and passenger ferries, LNG carriers, cable ships, icebreakers and icegoing tonnage and all types of special technology vessels.

A major development — created in close cooperation with ABB Industry, another Finnish maritime powerhouse — was the Azipod propulsion system.

The Azipod propulsion unit can rotate 360-degree and incorporates an electric AC motor located inside the propeller pod. A separate company, ABB Azipod Oy, was established in October 1997 to carry out the business activities of the Azipod system. A major breakthrough for the Azipod propulsion was the decision by Carnival to

select Azipod propulsion for two 70,400-gt Fantasy class cruise liners. Azipod propulsion was also selected for the 130,000-gt project Eagle-cruise liners for Royal Caribbean.

Finland also continues to play a lead role in the project to develop and display a commercially based service for the storage and distribution of Electronic Navigation Charts (ENC).

Via the European Union's 23month, 3.3-million ECU ECHO project, Finland's leading technology companies, working closely with European colleagues, used the Finnish icebreaker Fennica to prove the merits - including safety and cost effectiveness — of its system, which, among other features, utilizes standard shipboard communications equipment to receive updated versions of electronic charts.

Stop by Finland's Hall at SMM to learn more about Finnish maritime solutions.

Note: If your plans do not include SMM this year, simply circle the appropriate number (see below, left) on the Reader Service Card in this edition and free information will be dispatched to you.

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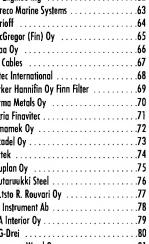
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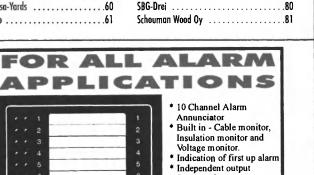
Finland At Your Service...

The following Finnish companies will be onhand at the SMM '98 exhibition in Hamburg, Germany to discuss their engineered solutions to maritime problems.

ABB Industry Oy Marine Div	LST-Engineering	6
Oy Acomarin Engineering Ltd	Mareco Marine Systems	6
Aker Finnyards Oy44	Marioff	6
ATA Gears	MacGregor (Fin) Oy	
Auramarine	Napa Oy	6
Deltamarin	NK Cables	6
Elektrolux Professional48	Optec International	6
Elomatic Oy	Parker Hannifin Oy Finn Filter	
Europlan Engineering50	Parma Metals Oy	
Finnish Maritime Technology Group51	Patria Finavitec	
Oy Finnscrew Finland52	Pemamek Oy	7
GSH International Oy53	Pocadel Oy	7
Hackman Metos Oy	Puttek	7
Hala-Tek55	Rauplan Oy	7
Helkama Bica Oy56	Rautaruukki Steel	7
ILS57	Ins.tsto R. Rouvari Oy	7
Kamewa Finland Oy58	Saj Instrument Ab	7
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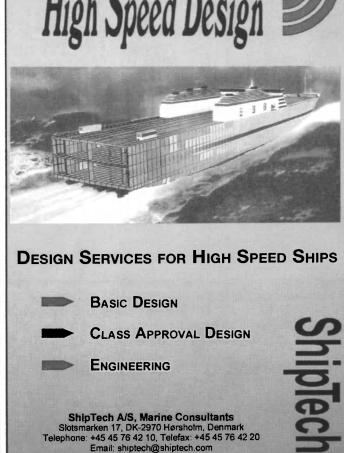
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Crash Test In Name Of Safety

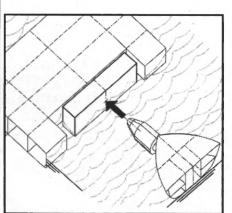
Earlier this year a collision test was conducted off the Dutch coast to verify the effectiveness of double side/skin tankers. As collisions are

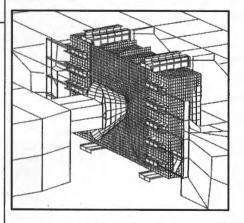
frequently the case of maritime mishaps, and the resultant budget-breaking pollution spills and clean-up, the aim of the series of

international tests strengthen efforts to minimize environmental hazards. Under German management, the partners included Technical University of Hamburg-Harburg (TU-HH), Germanischer Lloyd (GL) together with TNO Building Construction Research, Center for Mechanical Engineering, Delft.

The test was conducted to monitor the forces acting on the test section and on the ramming bow, as well as the movements of both ships. GL contributed financially to the project via the supplying of test models.

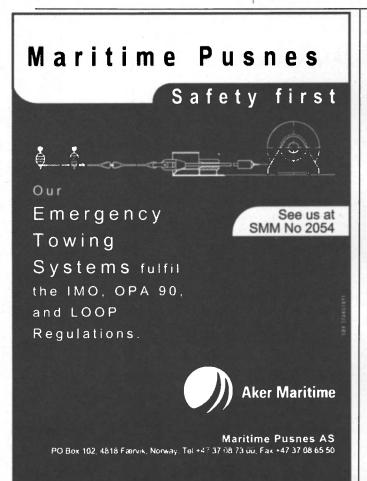
The test ships consisted of two inland waterway tankers initially intended for scrapping but prepared for the trials at a Dutch shipyard. Each measured approximately 262 ft. (80 m) long and had a capacity of some 1,200 tons. The test section was modeled on a tanker of some 40,000 dwt, scaled 1:3. It comprised a section from the side wall which reaches from the deck down to and including the







The Result: The hole and internal damage caused by the penetration of the bulbous bow.





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Professor Eike Lehmann, GL executive board member and professor at the Technical University of Hamburg-Harburg, said the collision test would provide data which would help verify the actual characteristics and qualities of double-hull structures.

double bottom, thus corresponding to the entire depth of the ship. This represents a double side-skin structure with three stringer decks and several vertical frames.

The ramming bow, also reduced to a scale of 1:3, corresponds to the bulbous bow of a 40,000 ton vessel, and was programmed to hit the vessel going six knots at the middle transverse, and to penetrate the outer and inner skin if possible. This was the plan, because only then could it be possible to measure the energy absorbed by the side structure up until rupture of the inner hull. The energy contribution required to tear open the inner skin represents the limit value for the collision safety of the structure.

Circle 3 on Reader Service Card

New BridgeMaster

Litton Marine Systems will unveil its new Decca BridgeMaster E marine radars in Hall 11 at SMM 98. Litton will also exhibit its full range of marine navigation, communication and information systems, including IBS, ECDIS, gyrocompasses, autopilots and other products. Litton Marine Systems is comprised of three legacy companies including Sperry Marine, Decca Marine and C. Plath.

Circle 2 on Reader Service Card

Complete Packages To Start Gas Turbines

For 20 years Voith has supplied gas turbine manufacturers with hydrodynamic torque converters to start gas turbines. For five years, complete start-up packages, comprising motor, converter, turning device, base frame and oil supply system have been delivered by Voith. The maximum power for which the start-up torque converters have been supplied to date was approximately 9,000 kW.

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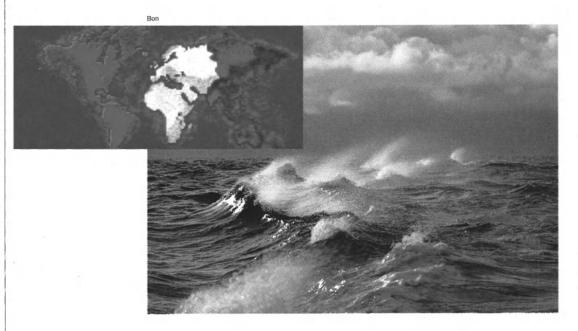
Laser Alignment Accurately

Machines joined by space-saving cardan shafts posed a challenge for shaft alignment. Prüftechnik AG reportedly has an answer to that challenge via its new cardan shaft accessory bracket for its Rotalign system. The

arrangement reportedly yields extremely accurate results, even over separations of up to 33 ft. (10 m), in a very short time.

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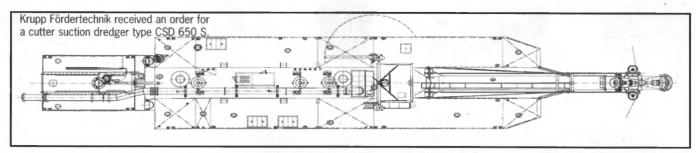


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Krupp Fördertechnik Gets Order For Dredger

Lübeck-based Krupp Fordertechnik received an order for a cutter suction dredger type CSD 650 S — a part of a new line of dredgers — from China's Gezhouba No. 5. The dredger will be built by the company's Dutch subsidiary Krupp Vosta B.V., in Amsterdam. The unit — measuring 213 x 34.4 x 8.2 ft. (65 x 10.5 x 2.5) with a total installed power of

2,800 kWb — is due for delivery in a complete installation. February 1999.

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Fasmer Offers New Boat

New regulations from the IMO have resulted in a completely new design from Germany's Fassmer Yard. The first newbuilding of the fast rescue boat FRIR 6.1 type started in July, and will be outfitted with a special davit system. The hull is built of glasfiber reinforced polyester resin (GRP) in deep V frame construction for hull planing. An inflatable fender with five independent compartments is installed around the boat, except at the stern, to give the boat added protection at sea. The design has been fully tested and approved, and meets the requirement of the 1983 amendments of SOLAS 1974 and the latest IMO MSC/Circ. 809.

Circle 9 on Reader Service Card

Automated Calibration For Pressure Gauges

WIKA's product range of test and calibration equipment was expanded by a new calibration system. The new system makes it possible to calibrate, test and document electrical pressure gauges and pressure transmitters with electric output.

Circle 10 on Reader Service Card

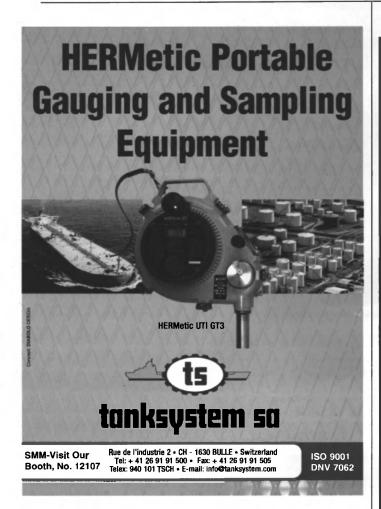


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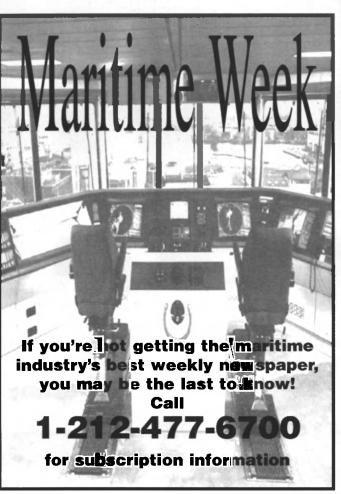
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Nupas-Cadmatic Available For Windows NT



Nupas-Cadmatic CAD/CAE/CAM software solution for shipbuilding is now available also on Windows NT platform. The company is also planning a major new release V4.0, at the SMM '98 eshibition.

Nupas-Cadmatic is a 3-D CAD/CAE/CAM solution for shipyards and consulting offices, designed to improve the efficiency of design, engineering and production.

NUPAS-CADMATIC is a joint venture of Numeriek Centrum Groningen B.V. from Holland and Elomatic/Cadmatic Ltd from A new Windows NT version from NUPAS-CADMATIC 3D ship design and engineering software is released with the addition of a new platform to the list of currently supported UNIX platforms. Functionality in this new version is equal to the UNIX version. The development will be parallel for all the supported platforms in the future. At the same time with the Windows NT version also a new release V4.0 of the software is launched. This new release together with Windows NT version was introduced last May. Having already the shortest training period on the market, the new Nupas-Cadmatic release V4.0 will reportedly shorten it even more for the new users.

Circle 197 on Reader Service Card

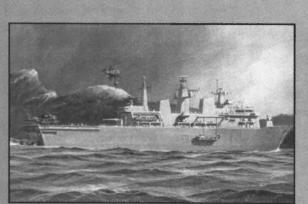
(Look for more SMM '98 news and previews on page 50, following the Propulsion Pull-Out Section)



Caterpillar 3516BTA's power Hvide's new SDMs.



DU-Sulzer 12RTA96C.



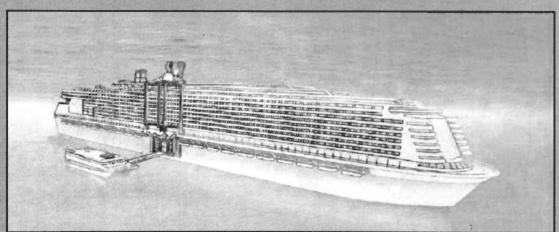
Propulsion salaction was not yet taken place for this new series of landing craft to be built by



Steam propulsion plants generating 70,000 hp like the USN's areast LhD.

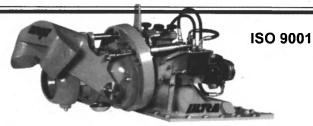


A pair of Dautz MWW TDB engines drive this Italian - bullt vessel to 30 knots.



If they are ever built, a fleet of massive casino vessels are designed to be powered by **the** Azipod propulsion system.

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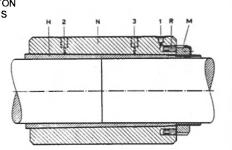
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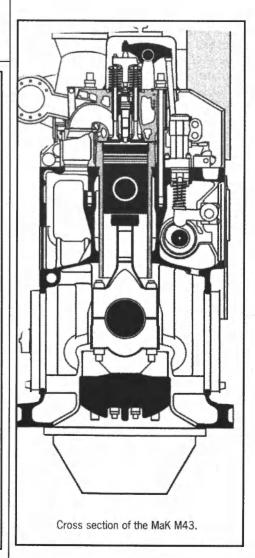
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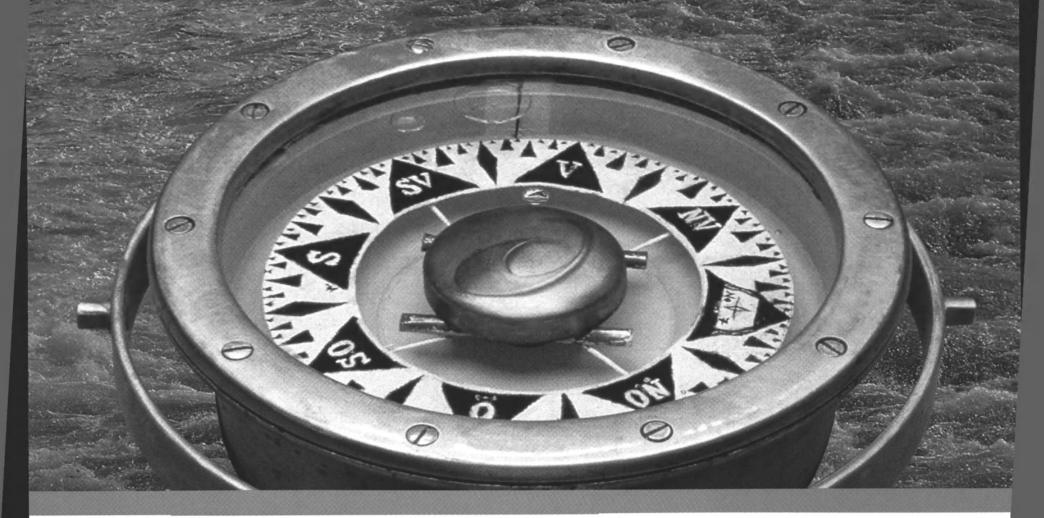
ingestion system, in order to prove its feasibility under actual operating conditions in the North Sea. It is anticipated that the plant will be able to recover sufficient vapor from a cargo lifted on the Stafjord field, for instance, to fuel a voyage to Rotterdam and back.

More than 12 MC-series engines already on order have been prepared in mind of possible utilization of VOCs, which effectively means converting a pollution source into a clean energy resource. As a further key stage in the evolution of the two-stroke marque from Denmark. the concept of the 'intelligent engine' is set to be introduced into sea-going service this fall. Parallel to the refinements in engine and componentry design aimed at better ensuring minimal, unscheduled downtime, MAN B&W has developed a family of software application products under the generic name computer-controlled surveillance $(Co\bar{CoS})$. The move is in line with a shift from conventional preventive maintenance practices to predictive maintenance using sophisticated, microprocessor-based



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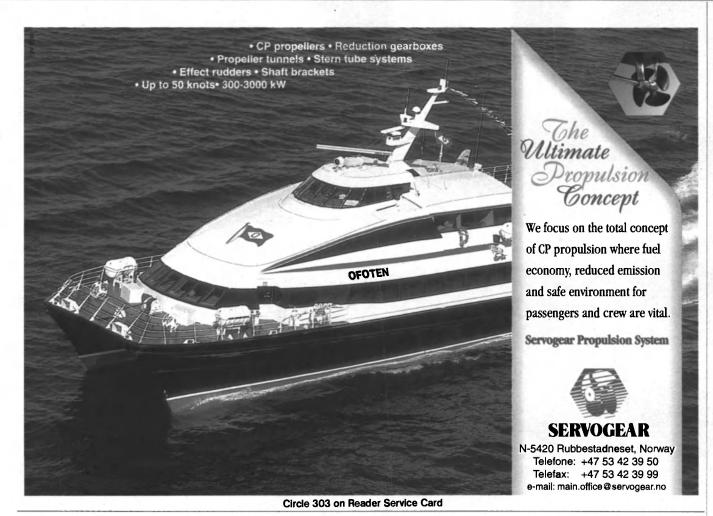


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diagnostic and control techniques.

The goal of the CoCoS project has been to develop an intelligent engine (IE) management system combining the basics of the CAPA and MODIS Geadit performance analysis methods formulated by the group in the late 1980s for two-stroke and four-stroke engines, respectively.

Increased plant availability and reliability, and effective reductions in operating costs and losses attributable to engine failure are the cornerstone objectives, while raising the efficiency of engine maintenance planning, spare parts identification, and providing an integrated stock handling and parts procurement system.

The engine diagnostics module dedicated to performance evaluation, CoCoS-EDS, also serves as a tool for logging, monitoring and storing operating data over the long-term. The maintenance planning system (MPS), spare parts catalogue (SPC) and spare parts ordering (SPO) elements can communicate with each other, or function as separate, stand-alone systems.

The recent commissioning of the 6,690-TEU containership P&O Nedlloyd Rotterdam provided a further showcase for the most powerful engine design currently at sea, the 12-cylinder version of the Sulzer RTA96C type, developed by Wartsila NSD's Corporation's two-stroke stable in Winterthur.

The industry's adoption of the new thoroughbred diesel, first seen in its 11-cylinder configuration on NYK Line's 5,750-TEU duo NYK Antares and NYK Altair, and subsequently in 12-cylinder format on the lead ship in the P&O Nedlloyd post-Panamax program, P&O Nedlloyd Southampton, vindicates the designer's emphasis on reliability

With service continuity and cargo delivery dependability being the watchwords for operators in an intensely competitive market, the selection of enormous concentrations of power in single, direct-drive installations signifies trust in the technology, stemming in part from the track record of the earlier RTA84C containership-orientated design.

The expectations of the shipowner of vessel, equipment

and personnel are clearly apparent in the continuous 56-day round-trip schedule between North Europe and the Far East, to be interrupted only by scheduled dry-dockings, to which the P&O Nedlloyd Rotterdam has been assigned within the framework of the Grand Alliance liner consortium. An average 22.5 knots is needed simply to maintain the itinerary, such that legs are made at up to 25 knots to better guarantee the program.

Weighing 2,030 tons and constructed under license at the Aioi works of Diesel United, each of the engines selected for P&O Nedlloyd's new generation of IHI-built express vessels offers a record-breaking propulsive power of 89,640 bhp at 100 rpm.

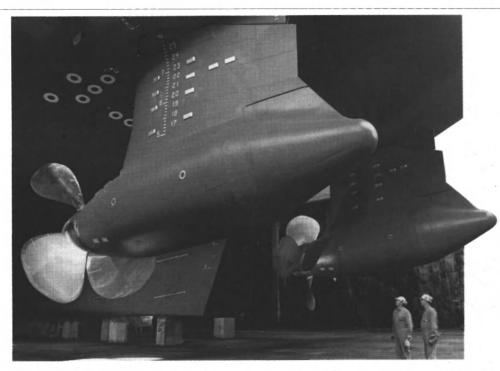
While P&O Nedlloyd Rotterdam will normally bunker 380-cSt heavy fuel, the company's Dutch technical management is keen to use still more cost-attractive 500-cSt where available, indicative of the confidence in the plant's ingestion capabilities and operating performance.

Although the daily fuel consumption entailed in propelling the 90,000-dwt vessel at speeds up to 25 knots is considerable in absolute terms, the efficiency of the installation springs from the relationship of fuel costs to TEU slots and overall ship productivity. Further, the adoption of a huge shaft generator, designed and manufactured in the U.K. by Brush Electrical Machines, yields additional economic benefit in that the vessel's at-sea electrical energy is derived from a power source based on relatively low cost, residual fuel oil.

While providing the means for covering the extreme powering needs of linehaul vessels, Wartsila NSD's decision to offer the 960 mm-bore size in configurations from six cylinders upwards recognizes the wider market potential offered by a design in which greater concentrations of power give advantage from a ship design and hull volume utilization standpoint. Thus the RTA96C provides for applications of 44,820 bhp upwards at nominal maximum rating, in six-cylinder version, or potentially from 31,320 bhp in derated mode.

At the time of writing, Wartsila NSD had recorded eight sales in total for RTA96C machinery, comprising the NYK pair, the quartet of P&O Nedlloyd ships, plus 10cylinder versions for two 5,300-TEU Hanjin Shipping newbuildings. However, a very substantial number of further applications are in the pipeline, with the marque apparently set to benefit from the surge in orders for high-capacity

Two 14 MW Azipod® units installed on the Elation



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Carnival's *Elation*, the world's first cruise vessel to feature Azipod propulsion, performed her sea trials exceeding all predictions: propulsion efficiency improved by 8 % compared to her earlier sister vessels. Her maneuvering characteristics and crash-stop performance were excellent and vibrati-

on levels were low. She and her yard sister, the *Paradise*, slated for delivery from Kvaerner Masa, feature twin 14 MW Azipod units, as part of the complete electric propulsion & power plant from ABB Marine. This success has led to recent orders of similar Azipod plants for an additional nine cruise liners: for Carnival,

Costa, Hapag-Lloyd and Royal Caribbean - with outputs of up to 19.5 MW per unit.

Azipod propulsion offers major benefits in enhanced

maneuverability and hydrodynamic efficiency, resulting in shorter harbor times, safe operation in harsh weather and restricted passages - plus reduced exhaust emissions, fuel consumption, noise and vibration. The need for long shaftlines, rudders, and stern thrusters is eliminated, resulting in space and weight

savings. Azipod units are available in power ranges up to 25 MW (34,000 hp) for cruise vessels, ro-ro ferries, tankers, container vessels and offshore DP vessels.

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containerships witnessed so far this year. Significantly, confirmed customers have all previously employed the RTA84C design, the market leader in boxship propulsion. In the meantime, building blocks for further strategic developments of potentially major sig-

nificance have been laid by an industry which has fostered a high degree of consolidation and collaboration in recent years. In particu-

lar, and as a consequence of the Metra Corporation's plan to divide its major interests into three separate, listed groups, Wartsila NSD is set to become part of a new diesel and gas engine company.

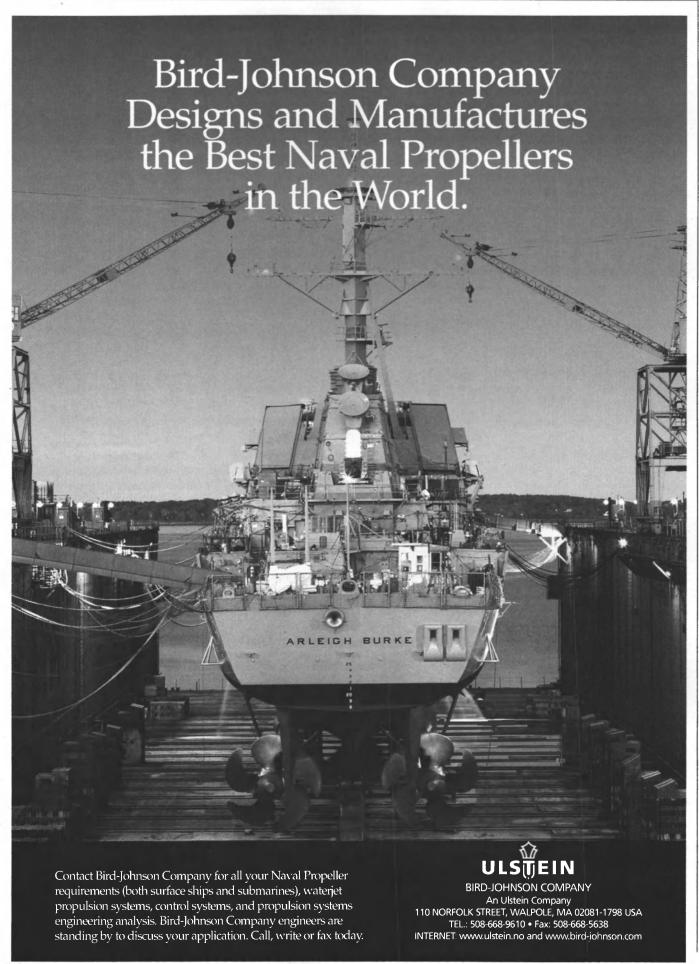
Draft terms for the demerger are expected to be completed by October this year, with a view to implementing the reconstitution of the group's various industrial activities, comprising specialized steel manufacture and bathroom products, along with engineering, some 12 months later. The fact that Metra Finance, the whollyowned subsidiary which acts as the group's internal bank, will form part of the new engine concern will no doubt strengthen the latter's capabilities to offer complete solutions for marine propulsion and power generation pro-

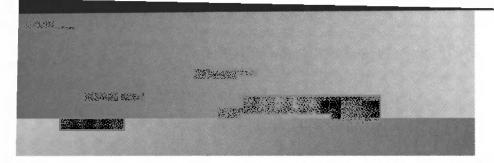
How the spin-off and quotation on the Helsinki Stock Exchange will influence future policy remains to be seen. 'Full-liner' Wartsila NSD, embracing the design, manufacture, licensing, sales and servicing of Wartsila and Sulzer engines from 500 to 66,000kW, is presently owned 87.8 percent by Metra, the balance of 12.2 percent being in the hands of Fincantieri, the owner of the former New Sulzer Diesel. With a buoyant order intake so far this year, Wartsila NSD expects that 1998 will show a substantial financial improvement on last year, when sales turnover was FM 11.3 billion

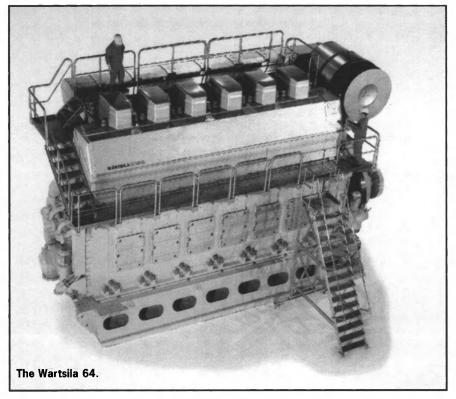
The recent contract intake has notably included the first marine applications for the Wartsila 64 design, the world's most powerful medium-speed engine. While the opening order involved a 12-cylinder version for use in a new, combined-cycle power station at Vaasa, in Finland, it is understood that the breakthrough deal in the maritime market arises from a Finnish newbuilding contract at a German shipyard.

The remarkable Wartsila 64 design offers an output of around 2-MW per cylinder from a compact envelope, and its NOx exhaust gas emissions have been kept below IMO-prescribed levels without penalizing competitive consumption performance.

The Vickers Group of the U.K.,







cash-rich after the sale of Rolls-Royce Motor Cars to Volkswagen of Germany, is planning to strengthen its position in the marine propulsion market by way of takeovers and joint ventures. It is reportedly considering the possibilities for broadening its sectoral involvement from propellers, thrusters and waterjets, currently represented in the Swedish-based Kamewa business, to complete propulsion packages.

Collaboration fostered through Kamewa has already set the group on the path, starting with last November's link-up with Volvo Penta to create Advanced Propulsion Systems, providing integrated solutions covering the 200-800-bhp sector of the market. Packages combine Volvo Penta diesel engines and transmissions with Kamewa waterjets and control systems. Vickers' Scandinavian subsidiary has also entered into a collaborative venture with electrical engineering specialist Cegelec to develop and supply podded propulsion systems aimed primarily at the cruise ship, ferry, offshore and naval markets. The resultant Mermaid system is being developed by Kamewa, with Cegelec responsible for the electric drive.

As part of the ongoing structural changes in the industry,

meantime, MAN B&W has secured the majority interest in the French diesel engine manufacturer SEMT Pielstick, and created a joint commercial venture with the Saint Denis-based company to promote sales of diesel power plants based on the combined medium-speed range.

The French company had been owned and managed on a 50/50 basis by German-controlled engineering groups MAN B&W and MTU Friedrichshafen since its 1988 takeover from GEC Alsthom. As a consequence of the shareholding changes, the respective stakes are now 66.6 and 33.4 percent, albeit with no change in responsibilities of MAN B&W for the Pielstick PC series and of MTU for the PA range.

As regards MTU's own medium-term commercial development, an expansion-orientated policy has been implemented, targeting a first-time DM2 billion-plus turnover for the year 2000. Compared to 1997, this would represent an increase of more than DM350 million, or 21 percent.

The first of seven Marine Protector-class patrol boats equipped with two MTU 8V396 engines of 1,475-bhp each was commissioned from Bollinger Shipyards by the U.S. Coast Guard earlier this year. While

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the current seven-ship program is due to be completed by January 1999, the prospect of options being taken up on a further 44 craft has enormous implications for engine supply continuity. Former GEC-Alsthom Engines, under its new, anglicized identity as Alstom Engines, attained a further milestone with its Ruston RK270 medium-speed diesel when the Incat wavepiercing catamaran Cat-Link

V achieved the fastest Atlantic crossing by a passenger vessel in July this year. Installed with 28,320-kW of primary power in the shape of four 20-cylinder models of the Merseyside-manufactured RK270 series, she made the run at an average speed of 41.2 knots, over a period of little more than 2 days 20 hours.

Earlier, another Incat-built twin-hull ferry, the 28,800-kW Catalonia, had made the crossing at an average 38.85 knots, beating the record set in 1990 by the Ruston-powered Hoverspeed Great Britain, by more than two knots. Catalonia is a showcase for the Caterpillar 3600-series engine, employing four examples in 18-cylinder configuration.

The team-up several years ago between Bazan Motores and Caterpillar to develop the new Bravo class of V engines reflected the Spanish company's particular expertise in the production of lightweight propulsion machinery. The move was in line with Caterpillar's bid to ensure a stronger basis for its endeavors on the European market, and indicative also of a perceived requirement for a more compact class of diesel derived from the robust, well-proven 3600-series.

The Cartagena factory, which includes a foundry and pattern shop, has a broad-based business mix right now, comprised of a rising number of Bravo engines, plus license-built MAN B&W 20/27 and 40/45 models, and a particularly buoyant level of orders for MTU machinery, most especially the 183-series.

The German medium-speed specialist within the Caterpillar Group, meanwhile, has maintained its identity and its ability to strengthen the family unit through the unveiling of the MaK M43 medium-speed engine, the fourth in the company's new generation of long-stroke diesels.

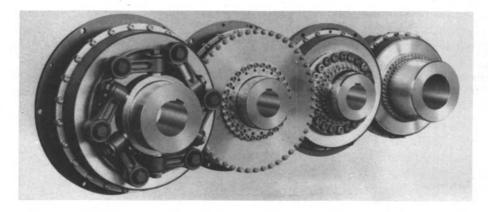
The latest pure-bred contender from the Kiel stable is distinguished by a stroke-to-bore ratio of more than 4:1 with a cylinder output of 900 kW at moderate speeds of 500-514 rpm. Since MaK Motoren intends to make the design available in formats up to 18-cylinders, it will span the power spectrum to 16,200-kW.



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Coupling Corp.'s Flexxors Offer Flexibility

Coupling Corp. has manufactured Flexxors — touted as the most flexible shaft coupling in the industry - since 1968. The couplings are based on lightweight, flexible diaphragms that transmit high torques, while providing the largest deflection capabilities for axial, angular and offset misalignments. The couplings are reportedly excellent for marine applications because they are designed to minimize transmissions of axial forces, or forces due to misalignment. Flexxors reportedly transmit virtually no vibration between shafts, and require no lubrication or maintenance. Coupling Corp.'s reference list includes Premier Cruise Lines, and has at least eight couplings installed on main engine drives for the line's ships.

Circle 117 on Reader Service Card

Electric Podded Propulsion To Be Discussed At Conference

All Electric Ship 98: Developing Benefits for Maritime Applications is the title of a conference scheduled for September 29 and 30 in London. The conference will, among other topics, review the technical and marketable future of electric podded propulsion, and review the arguments for and against AC or DC distribution.

The conference is scheduled to at revolutionary approaches to devise the most cost effective electric ship of the future. The U.S. Navy's latest electric power generation and propulsion motor developments will be revealed, as will the Dutch Navy's first experience with the new diesel electric LPD.

For additional information contact Louise Pembroke at tel: +44 171 481 8493; fax: +44 171 488 1854; e-mail: lap@imare.org.uk.

Mobil Introduces New **Version Of Synthetic Oil**

Mobil Corp. recently introduced an improved version of its Mobil SHC 600 Series of synthetic lubricants for gears and bearings, which is designed to last up to eight times longer than mineral

oil. The reformulated synthetic lubricants can also reportedly offer substantial anti-foam capability, and outstanding stability and performance in the presence of water,

while maintaining viscosity in extreme temperatures. In addition, the reformulated products are orange, devised to help customers more easily detect oil levels

in the sight glass on their equipment.

The reformulated product which just became available in the U.S. and Latin America on Sept. 1

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and will become available elsewhere as of January 1999 — is fully compatible with all existing SHC 600 series oils, and can be used in purifier, controllable pitch propeller, thruster and other marine gear applications.

Mobil's research team developed the new SHC 600as a result of the company's overall experience and investment in synthetic base stock and finished product formulation.

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Deutz Powers Ahead

The accumulated diesel engine design and manufacturing experience of the Deutz AG organization has produced a comprehensive range of new engines.

Since its introduction in 1994, the 616 series has found wide acceptance for applications which demand high power/weight ratios, together with reliability and economy of operation. It is produced in V-8, V-12 and V-16 cylinder configurations with a power range of 320 kW to 1,360 kW (435 to 1,850 hp). The 616 series succeeds the 234 series and maintains the compact dimensions while achieving a 30 percent increase in power by means of increasing the bore and stroke.

The 620 series, which is the latest development of the 604B series provides robust, highly fuel efficient engines. It is produced in V-8, V-12 and V-16 cylinder configurations ranging from 530 kW to 2,240 kW (720 to 3,045 hp) at speeds between 1,500-1,860 rpm.

The new 632 series was designed and produced under a joint program by Deutz MWM and General Electric Transportation Systems, and embodies the latest design, material and manufacturing technology. The series is available only in V-16 configuration (in the range from 4,560 to 5,600 kW or 6,200 to 7,600 hp). In the near future, it will also be produced in 6, 8 and 9 in-line versions, as well as V-12 and V-18 configurations. When the line is expanded, the power range will span from 1,710 to 7,400 kW (2,325 to 10,060 hp).

Circle 119 on Reader Service Card

Falk Thrusts Back Into Marine Market

The Falk Corporation has reconsidered its decision of last October to exit the new unit construction

Easy Come, Easy Go

Little more than a month after the Caterpillar-powered, Incat-built Catalonia broke the speed record for crossing the Atlantic, another Incatbuilt vessel broke the record, despite a mid-run stop to search for a missing single-engine aircraft.

Cat-Link V, powered by Alstom Engines, type Ruston RK270's, is a 298.5 ft. (91 m) vessel capable of carrying 800 passengers and 200 cars. It passed the official starting line at 6.08.42 UTC on Friday, July 17, and crossed the finishing line just off the crossed the finishing line just off the the trans-Atlantic crossing record. English coast at 02.17.42 UTC on Bottom: Four Ruston RK270's power the Cat-Link V. Monday, July 20, meaning the nearly 3,000 mile trip was completed in two days, 20 hours and nine minutes at an average speed of 41.205 knots.

The record was set despite the vessel receiving and acting on a MAYDAY call from the Rescue Control Center in Halifax which requested the vessel to suspend its run in helping to search for a missing single-engine aircraft thought to be missing in the area.

All of the Cat-Link vessels are powered by Alstom engines. The recordbreaker features four 20-cylinder Ruston RK270's, each with a continuous unrestricted rating for commercial fast

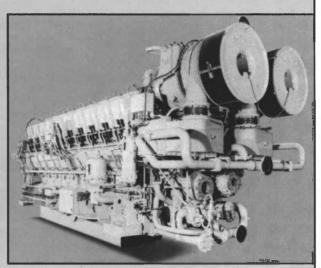
ferries of 7,080 kWb at 1,030 rpm. The 16 and 20-cylinder RK270s have established a leading position in fast ferry propulsion worldwide.

"Alstom Engines has maintained its position at the forefront of marine propulsion technology by responding to the requirements of operators and shipyards, for higher powers and increased reliability," said Jim MacKinnon, managing director, Alstom Engines, Ruston Division.

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Top: Cat-Link V, powered by Ruston diesel engines, recently broke



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end of the marine market, and the company has made a new, solid commitment and, said Craig Wendlandt, manager of the Engineered Drives Business Unit, "we're in it to stay."

Since the restructuring of the company into business units, all products have been reviewed and the decision was made to continue to support marine orders for the existing MR and MRH line of previously designed drives.

Circle 120 on Reader Service Card

MC Shipping Seeks To Expand

MC Shipping Inc. is reportedly evaluating acquisition projects in the container and gas shipping sectors. The company also expects to add significantly to its current fleet of 20 vessels in the near future. MC Shipping operates its fleet in the liquefied petroleum gas and container and multipurpose sectors. The company expects the liquefied petroleum gas market to show renewed strength during the second half of 1999 or earlier.

Noble Drilling Announces Semisubmersible Purchase

Noble Drilling purchased the *Shelf 6*, a Friede & Goldman 9500 Enhanced Pacesetter design semisubmersible, built in 1986. The unit is currently located outside Wakkanai Harbor, Japan. This unit is currently rated to operate in 600 ft. of water. Plans call for the *Shelf 6* to undergo refurbishment and upgrade for work in deeper water depths upon Noble securing a long-term drilling contract.

Panama Canal To Begin Ship Safety Inspection

The Panama Canal Commission (PCC) was to launch an inspection program Aug. 17 that would affect ships traversing the Panama Canal. PCC inspectors will check

safety equipment, machinery, fittings, fire-fighting systems, and other related aspects of vessels chosen for inspection. The selected ships will be required to meet internationally accepted standards, unless modified by the ship's Classification Societies. Vessels selected will not be advised of an inspection until after their arrival at the canal. The inspection program should investigate two or three ships a day in both Balboa and Cristobal ports once the program is in full operation.

China State Shipbuilding Output Up 28.6%

Output of China's State Shipbuilding Corp. reportedly jumped a year-on-year 28.6 percent to hit \$313.3 million in the first half of this year. The company was reported to have finished building 46 ships in the first six months. However, hit by the Asian financial crisis, the company had signed only 820,000 tons in shipping contracts, worth \$1.2 billion in the first half, down one third from the year-ago period.

OMI Orders Tankers

OMI Corporation ordered two 156,000 dwt Suezmax crude oil tankers for delivery in January 1999 and May 2000. OMI said it had also ordered two 35,000 dwt product tankers for delivery in mid-1999 and taken options to order a further two Suezmax vessels.

The company gave no further details of the contracts. OMI said it currently has a fleet of 28 vessels, including two Suezmax newbuildings, one vessel held for sale and four chartered-in tankers.

SembCorp. To Make Cuts

Sembawang Corp. Ltd. (SembCorp.) reportedly will look to trim costs in non-core businesses. The company's marine and heavy industries unit performed well fol-

lowing the merger of Jurong Shipyard Ltd. and Sembawang shipping assets last year. Turnover rose to \$270.7 million compared to \$85 million previously. It contributed a pre-tax profit of \$22.7 million against \$2.9 million a year ago. The engineering and construction group also fared well, accounting for \$248 million in turnover and \$6.7 million in pre-tax profits. SembCorp.'s core competence are in marine and

Thordon Rolls-Out Pollution-Free Open Bearings At SMM

A pioneer in the development of pollution free bearing designs, Thordon Bearings will present both sealed and open, water lubricated propeller shaft bearing systems options at the SMM exhibition in Germany.

The company's Compac open water lubricated propeller shaft bearing system is designed to offer pollution-free simplicity, as well as long life in blue water opera-

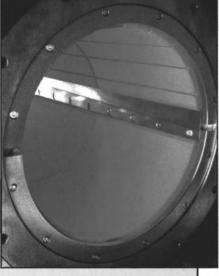
well as long life in Thordon Compac Bearing System. blue water opera-

tions. The system is featured on the Grand Princess and Disney Magic.

Thor-Lube is designed as an environmentally friendly, sealed stern tube bearing system that eliminates pollution concerns related to stern tube oil.

The sealed system uses non-metallic Thordon XL bearings and Thor Lube, a non-polluting water soluble lubricant.

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Samsung Acquires License For Propeller Efficiency

Mitsui O.S.K. Lines Ltd. reported that a unit was licensing shipbuilder Samsung Heavy Industries Co. for a device — propeller boss cap fins — that makes propellers more efficient. M.O. Ship Tech Inc. will reportedly receive licensing fees as well as royalties on each device sold by Samsung Heavy.

Bender Appoints Shank And Ryba Managers

Bender Shipbuilding & Repair Co., Inc. has appointed **Robert L.** Shank as its Engineering Manager and **John S. Ryba** as its Design Group Manager.

Ships Machinery Chooses Hall As Sales Engineer

Ship Machinery International Inc. (SMI) has chosen **Charles Hall** as Area Sales Engineer, heading the newly-established office of SMI in New Orleans.

Dapena Joins James P. Colie And Association

Marine general contractor James P. Colie & Associates recently announced that **Jean Dapena** has joined the firm as Director of Operations and Design. Ms. Dapena will take on a leadership role in many areas, including: projects, clients, design, drawings, drydocks, and new business.

GE LCI Delivers High Reliability

GE Industrial
Control Systems
has introduced its
Innovation Series
Load Commutated
Inverter (LCI) AC
drive system, which
builds on the high
reliability and efficiency of the company's earlier systems
for industrial and
marine applications. GE's LCI has



for industrial and GE's Innovation Series LCI AC drive system provides marine applications. GE's I CI has marine synchronous motor applications.

been in service for over 15 years.

The LCI, also known as the synchroconverter, works as a synchronized system, with the control and motor coordinated to work together. The LCI controls motor torque to regulate motor speed, making it motor friendly and enabling users to obtain drive system availabilities of 99.76 percent. The new Innovation LCI is designed to deliver even greater reliability and diagnostic intelligence for enhanced system performance. Low magnitude, high power factor starting currents minimize voltage dips during startup. The lack of short circuit contribution by the LCI drive maximizes the load carrying capability of the system bus for a given switchgear rating. GE reports that the LCI's immunity to bus disturbances makes it well-suited for power plant applications where bus switching and other transients are common.

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Volvo Penta's Test Facilities Stress Environmental Compliance

Volvo Penta's marine test facilities at Krossholmen, Sweden are a good example of environmental friendliness at work.

Krossholmen is the test facility for the company's engines and drives, as well as engines for commercial boats. Currently, the company has 30 boats in the test fleet. Environmental care is a core Volvo Penta value, and the facility features a high-pressure washing unit for boats and drives, as well as an environmental waste station.

The boat washer is reportedly the first of its type on the Swedish west coast.

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Kistler Takes Engine Monitoring A Step Further

Kistler has taken its precise sensors a step further with the type 6041, which the manufacturer touts as the smallest watercooled sensor in the world with an 8 mm front diameter (M8 thread). Kistler reports that the continuing trend towards smaller engines requires sensors to adjust accordingly, while offering the lowest possible thermal shock error.

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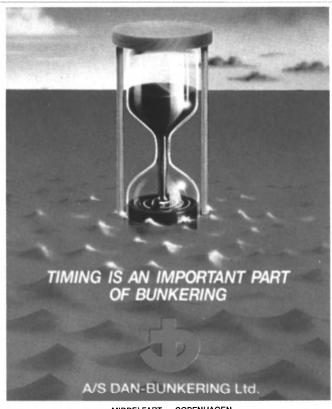
IMAC AB And Norsteel A/S Join Forces

Swedish IMAC AB And Norwegian Norsteel announced it has merged, becoming a bigger company in the marine accommodation industry. As a consequence of the merger between the two companies, the owners will form a holding company based in Oslo, Norway.

The new company will have 300 employees, of which 100 will be based in Norway. A separate sales company, IMAC A/S will be set up in Tønsberg, Norway based in offices of Nordam A/S. This company will responsible for sales and marketing within the Norwegian sector.

MR/EN Marine Propulsion Supplement

Global sales and marketing of the complete marine production will be carried out by IMAC AB from its office in Helsingborg, Sweden. According to the two companies IMAC AB and Norsteel A/S, the merger will offer a wider range of products and strengthened our position as a supplier with a complete product program for marine accommodations, both offshore and to the shipbuilding industry. All the knowledge gathered within this new group in the fields of engineering and sales can be used more efficiently and that will increase the competitiveness on the world market.



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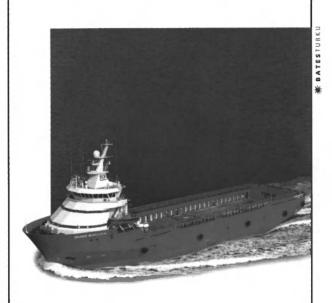


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MTU Nabs Navy, USCG Contracts

The U.S. Navy has ordered more than 60 12V 396 engines from MTU Friedrichshafen to be used in its Mark V special patrol boats. Two engines, each with a total power of 3,360-kW drive the Kamewa waterjets, accelerating the 82-ft. (25-m) to speeds of more than 50 knots. The series-built vessels have been under construction since 1995 by Halter Marine.

MTU has also won other prestigious orders in the form of patrol boats of the Marine Protector Class for the U.S. Coast Guard. The

first of seven craft with MTU engines was commissioned in New Orleans in March. Each patrol boat will be powered by two MTU 8V 396 engines of 1,475 hp each. The vessels, built by Bollinger Shipyards, can reach a speed of 25 knots and carry a crew of 10.

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To date, the U.S. Navy has ordered more than 60 12V 396 engines for more than 30 patrol boats. The vessels are being built by Halter Marine.



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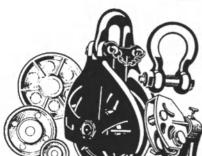
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Turbocare Appoints Leger New GM

Turbocare has appointed **Donald R. Leger** to t position of General Manager, responsible for overday-to-day management of TurboCare's Chicop Operations.

Elliott Acquires Three Turbine Companies

Elliott has acquired Turbine Specialties Inc. an American Diesel Engineering and consolidated th three facilities into a new operating unit, Elliot Turbocharger Group Inc.

EMS Appoints Scherger As New VP

Electronic Marine Systems, Inc. appointed Jacl Scherger as the company's VP of Sales, responsible for continuing the dramatic growth of the level sensor product line.

Kirby Corp. Dedicates New Center

waterways.

The Kirby Corp. dedicated a new operations and training center in honor of its chairman, George A. Peterkin, Jr.

Mr. Peterkin has served as Kirby's Chairman of the Board since April 1995, a Director of Kirby since 1969, and served as its President from 1973 to Right: George April 1995. He has been A. Peterkin, Jr. an industry leader and pio-

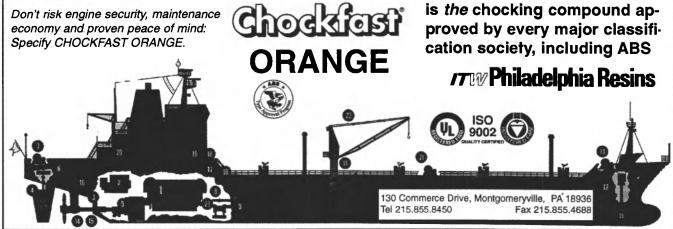


Top: George A. Peterkin, Jr. Ops. & Training



neer in the design and operation of modern tank barges and towboats used on the nation's inland

> The George A. Peterkin, Jr. Operations and Training Center houses five Kirby groups: Kirby Inland Marine Operations; Kirby Inland Marine Maintenance; Western Towing Co.; Kirby Logistics Management; and the Kirby Training Center. The Center also includes an Incident Command Center from which management will be able to oversee and monitor response to severe weather and high water conditions and marine emergencies.



Next Generation Warship ecifies Diesel Electric Propulsion

Trimaran Helps to Keep Vosper Thornycroft at Forefront of Technology

Vosper Thornycroft's (VT) winning of the intract to design and build the first trimaran arship demonstrator, RV Triton, will maintin the company's position as a world leader a naval ship technology.

The Defence Evaluation and Research Agency (DERA) awarded the contract for the 295.3 ft. (90 m) long warship. One of the purposes of the demonstrator will be to determine whether a trimaran hull form will be suitable to be considered for the Future Escort, to replace the current Type 22/23 frigates. In addition to DERA's work on trimaran hull forms, VT carried out its own R&D program, consisting of taking the company's design of a vessel, and applying the same payload to a trimaran design. This was found to produce considerable fuel savings, reductions in through-life costs and operational advantages. VT has a long tradition of producing innovative ship designs, both for the British Royal Navy and overseas navies. Among the more notable achievements have been the construction of the world's first fibre-reinforced plastic minehunter, HMS Wilton, in 1970; design and build of the Royal Navy's Type 21 frigate and the design and build of the Sandown Class minehunter, recognized as the world's most advanced mine-

VT naval architects are convinced the trimaran concept has considerable potential as a warship, and believe the adoption of a demonstrator program will make the U.K. the focus of naval ship design for the new millennium. Plans are to launch the demonstrator vessel in Spring 2000.

DERA's research followed up the research performed by the MOD sponsored chair at University college in London, in the late 1980s. Trimarans have been extensively used in the design of commercial yachts, but in that case, design requirements are completely different. Scaling up would not be representative of a warship.

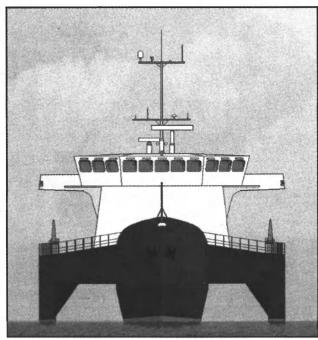
Additional advantages to the vessel include:

Seakeeping: Improved seakeping performance compared with a similar displacement monohull, allowing higher speed to be maintained in heavy seas.

Flexibility: Larger deck area amidships allowing space for an additional helicopter if required and increased helicopter availability through siting the flight deck in the amidships region where motions are reduced.

Vulnerability: Limited stand off protection provided by the sidehulls against smaller sea-skimming missiles, and improved survivability following underwater explosions.

Signature: The possibility of exhausting between the side-hulls is



Vessel Specifications
(all data are approximations)

LOA:
LWL:
Side hull LWL:
Beam:
Main hull beam:
Side hull beam: 4.6 ft. (1.4 m)
Max drought: 10.5 ft. (3.2 m)
Displacement:
Speed: Maximum 20 knots
Propulsion: Diesel Electric propulsion.
Single-shaft, fpp & independent
side hull propulsion
Electrical supplies: 440 V 60 Hz 230 V
60 Hz; 115 V 60 Hz & high
voltage propulsion bus bar
Crew accommodations:
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Tel.: +49 6103 697745 Fax: +49 6103 697743 being explored as a radical method of improving the IR s i g n a t u r e . Modelling shows the radar signature to be no worse than the monohull and greater layout flexibility could even reduce it. The posi-

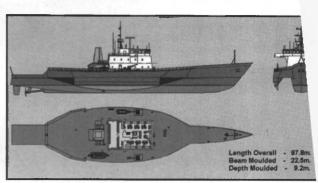
tioning of noisy machinery higher in the superstructure should result in a reduced underwater radiated noise signature.

DERA's research included the study of hydrodynamic performance; seakeeping, stability and manueverability; structural loading together with both under and above water vulnerability; signature aspects covering radar, IR, acoustic and magnetic predictions and combat system performance implications.

Data derived from the demonstrator build and subsequent trials will be used to support other areas:

Scaling Accuracy: The demonstrator will be designed using tools where the extrapolation from modelling has been verified by their testing in the demonstrator.

Capability for Naval Evolutions: The RN must have confidence normal RN operations



would not be impeded by Trimaran hull form. Of particul interest are replenishment at se towing, small boat operation berthing and handling.

Construction: A further benefi of building a large scale demonstra tor would be the experience gained by British shipyards in the construction of trimaran hulls.

The first trials are expected to begin in the year 2000, and conclude in March 2002.

The Phase 2 period, which will focus on derisking technologies (including a pre-planned mini refit to change the main propulsion motor with the main area of interest being in electric propulsion, where permanent magnet motors may be tested), will run from May 2000 through March 2004. The Phase 3 trials will begin in May 2004.

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Auxitrol Positioned For Bigger Piece Of Rador Tank Gauging Market

Auxitrol S.A. of France is one of 13 companies owned by U.S.-based conglomerate Esterline. The company, which sees nearly all of its sales (an estimated 95 percent) emanate from France, is making a major push to present its line of tank gauging products to the U.S. market, hoping to capitalize on the projected barge building boom as well as fulfill the tank-gauging needs of other U.S. and U.S. controlled vessels.

PN10 DN250 Flange

Deck

Cut out Ø 10°

In particular, the company is eager to present its TA 840 Radar Sensor, which was developed in cooperation with Thomson-CSF, and is a new generation of tank level gauging system for marine applications based on an Innovative Measuring Concept System.

The principle of the TA 840 Radar Sensor is the utilization of an intrinsically safe low-power processor unit which analyzes the antenna signal and converts the information into digital values. The TA 840 Radar Sensor is a totally sealed unit with a standard RS 485 field bus output signal, and for simplicity of installation, the sensor requires only two cable inputs. The TA 840 Radar Sensor is built for ease of installation and has two dedicated cable inputs. Power and RS 485 connections are provided by a six-core intrinsically safe cable and a 10-core screened cable provides temperature and pressure connections. A third cable entry is provided for additional sensors.

Circle 1 on Reader Service Card

) NOTES

Gets Rusten To Develop "American" e Project

nerican Classic Voyages Co. (AMCV) nted Jon Rusten as president of Ocean iopment, Co., a wholly-owned AMCV suby established to manage the construction vo 1,900 berth passenger ships scheduled delivery in 2003 and 2004. Mr. Rusten will see the newbuild project team, including the aining design, bidding and construction ises. A contract with a U.S. shipyard will be arded by April 1999: current competitors are ondale Industries, Litton Ingalls Shipbuilding d National Steel and Shipbuilding. The project ills for the design and construction of the first nerican-built large cruise ships in more than 40 ears, and has received national recognition for pearheading the revitilization of the U.S.-flag ruise ship industry and cruise ship construction n the U.S. The ships, each costing approximately \$400 million, will sail throughout the Hawaiian islands.

Wartsila NSD Announces Changes In North American Marine Organization

Wartsilà NSD will relocate its North American Marine Business Area to new facilities in Ft. Lauderdale, Fla. which will support marine business administration, cruise and commercial shipping product sales, project management and support functions. The company will also continue its offshore product sales, management and support activities from its office in Houston. In addition to the location change, Wartsila has announced the following appointments: Bill Malacrida (Vice President, Marine within North America): Fred Danska (Cruise and Transportation business segments from Fla.); Christopher Broman (Commercial Shipping business); Robert Kimmons (Offshore business from Tx.); Rick Shilling (Project Management, Fla.); David Steffens (Project Management, Tx.).

New Operations in China

Captain **Eric Southworth**, operations manager of Fender Care Marine and STS Transfer Services Ltd. of Norfolk, England, has been involved in three operations off the Chinese coast, contracted to Contichem of Norwalk, Conn. Capt. Southworth was involved with the supervision of ship to ship (STS) transfers of LPG for a large Korean ship owner of Seoul and similarly for a major Danish shipping company.

Kimbrell Named Head Of Hvide Marine Towing

Hvide Marine Inc. has announced the appointment of **James S. Kimbrell** as president of Hvide Marine Towing, the company's offshore and harbor towing division. He will also be elected a vice president of Hvide Marine Inc. Mr. Kimbrell



was formerly executive vice president, CFO and a director of Bay Transportation Co. Inc., which Hvide acquired last October. He succeeds Robert A. Santos who is retiring after 36 years with the company. With revenues of \$20.4 million in 1997, Hvide Marine Towing is a fast-growing part of Hvide Marine with domestic harbor tug operations in Florida, Alabama, Louisiana and Texas, as well as an expanding offshore business in the U.S. and Mexican sectors of the Gulf of Mexico.

USCG Seeks TSAC Members

The U.S. Coast Guard is seeking applications for appointment to membership on the Towing

Safety Advisory Committee (TSAC). TSAC is a 16 member Federal Advisory Committee that advises the Secretary of Transportation on matters related to shallow-draft inland and coastal waterway navigation and towing safety.

The advice and recommendations of TSAC

also assist the U.S. Coast Guard in formulating U.S. positions at meetings of the International Maritime Organization (IMO).

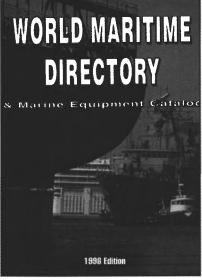
Each member serves for a term of three years.

Application forms may be obtained by writing

Commandant (G-MSO-1), U.S. Coast Guard, 2100 Second Street S.W., Rm. 1210, Washington, DC 20593-0001; by calling (202) 267-0229; or by faxing (202) 267-4570. Completed applications should be submitted to the Coast Guard by October 17, 1998.

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Mooring Master Ropes.



Mooring Master D-7: Braided core strength members produced from Dyneema® fiber covered by a braided nylon chafe protection cover. This product floats and has strengths higher than wire rope while being flexible and hand spliceable. The lowest stretch, highest strength floating rope.

MOORIN	G MASTE	R D-7				
SIZE (Dia.		WEIG	WEIGHT		AVERAGE STRENGTH	
Inch	mm	Lbs/100 Ft.	Kg/100M	Lbs	Kg	
1"	24	19.30	28.72	112,600	51,075	
1-1/8"	28	24.18	35.98	140,800	63,867	
1-1/4"	30	28.88	42.98	169,000	76,658	
1-1/2"	36	38.65	57.52	225,300	102,196	
1-5/8"	40	43.51	64.75	253,400	114,942	
1-3/4"	44	50.67	75.41	295,600	134,084	
1-7/8*	45	59.21	88.12	344,900	156,447	
2"	48	67.61	100.62	394,200	178,809	
2-1/8"	52	76.08	113.22	443,500	201,172	
2-1/4"	56	86.93	129.37	506,800	229,884	
2-3/8"	57	96.64	143.82	563,100	255,422	
2-1/2"	60	106.26	158.14	619,500	281,005	
2-5/8"	64	115.96	172.57	675,800	306,543	
2-3/4"	68	126.82	188.73	739,100	335,256	
2-7/8"	69	137.68	204.90	802,500	364,014	
3"	72	152.23	226.55	886,900	402,298	



Mooring Master P-7: High tenacity polyester fiber is used for the seven braided strength cores as well as the braided chafe protection cover. Its extremely high strength allows down-sizing from standard polyester constructions therby minimizing weight; it also provides an excellent deep water mooring profile or higher shock mitigation than high molecular weight polythylene ropes.

MOORING	G MASTER	₹ P-7			
SIZE (Dia.)		WEIGHT		AVERAGE STRENGTH	
Inch	mm	Lbs/100 Ft.	Kg/100M	Lbs	Kg
1-1/2"	36	54.82	81.58	100,580	45.623
1-5/8"	40	63.91	95.11	117,340	53,225
1-3/4"	44	74.46	110.81	136,900	62,098
1-7/8"	45	85.09	126.63	156,460	70,970
2"	48	91.25	135.80	167,630	76,037
2-1/8"	52	109.42	162.84	201,160	91,246
2-1/4"	56	123.12	183.23	226,300	102,650
2-3/8"	57	136.91	203.75	251,450	114,058
2-1/2"	60	152.08	226.33	279,380	126,727
2-5/8"	64	167.24	248.89	307,320	139,400
2-3/4"	68	182.49	271,58	335,260	152.074
2-7/8"	69	197,74	294.28	363,200	164,748
3"	72	216.68	322.46	398,120	180,587
4"	96	460.00	684.57	620,000	281,232
5"	120	611.80	910.48	1,021,900	463,534
5-1/4"	128	696.60	1,036.68	1,165,780	528,798
5-1/2"	136	774.50	1,152,61	1,294,480	587,176
6"	144	883.10	1,314.23	1,475,980	669,505
6-5/8"	160	1,086,10	1,616.33	1,816,760	824,082
7"	168	1,195.80	1,779.59	1,998,260	906,411
7-3/8"	176	1,303.80	1,940.32	2,179,980	988,839
7-5/8"	184	1,426.80	2,123.36	2,384,360	1,081,546
8"	192	1,546.60	2,301.65	2,588,740	1,174,252

Mooring Master N-7; Seven braided nylon cores contained within a braided nylon chafe protection cover. Designed for use in offshore applications requiring an energy absorbing capability, such as single point mooring.

MOORING	G MASTER	N-7			
SIZE (Dia.)		WEIGHT		MINIMUM STRENGTH	
Inch	mm	Lbs/100 Ft.	Kg/100M	Lbs	Kg
4"	96	423.48	630.22	551,124	249,990
4-1/4"	104	489.36	728.27	636,854	288,877
4-5/8"	112	571.62	850.68	744,017	337,486
5"	120	649.22	966.17	845,057	383,318
5-1/4"	128	722.88	1,075.79	964,467	437,482
5-1/2"	136	846.86	1,260.30	1,102,248	499,980
6"	144	952,73	1,417.85	1,240,029	562,477
6-3/8"	152	1,048.08	1,559.75	1,364,032	618,725
6-5/8"	160	1,164.47	1,732.96	1,515,591	687,472
7"	168	1,280.95	1,906.31	1,667,150	756,219

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The rope construction consists of seven braided core strength members contained within a thick, durable, braided chafe protection cover. The braids contained in a braid create cross-sectional firmness but allow good bending flexibility. The Mooring Master construction lets the strength cores do their work without being exposed to external wear surfaces.

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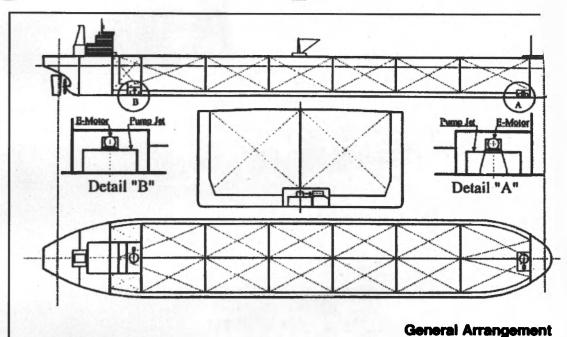


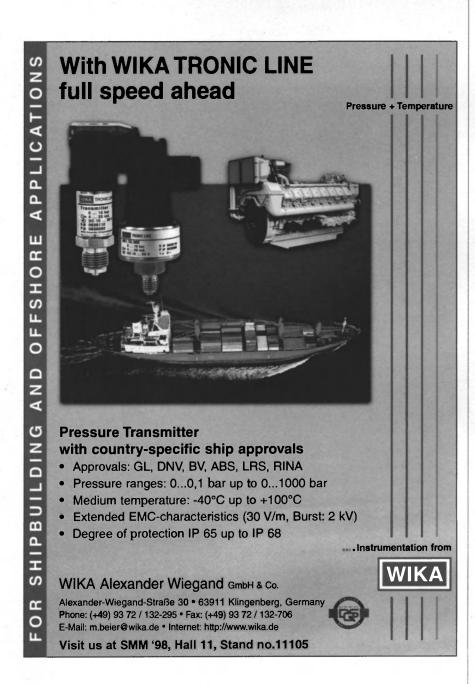
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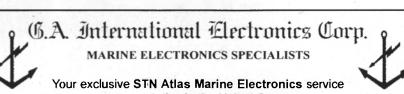
Earlier this year Germany presented to the IMO's 69th session of the Maritime Safety Committee (MSC) the first feasibility and rentability study of emergency propulsion devises using the Formal Safety Assessment (FSA) method.

The conclusion to an intensive study regarding tanker propulsion equipment failure and the real value of procuring the installation of a proven emergency propulsion system vs. the actual cost of safety, business and environmental loss seem to show that the investment is a wise one, even without the consideration of political implications of an accident.

As the example, a 145,000-dwt, 866 ft. (264 m) Suezmax tanker was used. The tanker is powered by a single 13,000-kW engine for a 14 knot speed when loaded. In case of damage to the main engine and its auxiliaries, shafting, propulsion, rudder, etc., emergency propulsion is handled by a pair of Schottel Pump-Jets (type SPJ 520) at 3,500 kW each. With the emergency propulsion driven by electric motors, the







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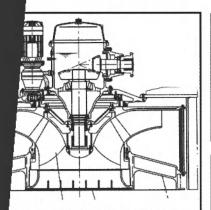
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Hapag-Lloyd Saves Space With K98MC Engines

MAN B&W's K98MC was chosen for Hapag-Lloyd's latest containership building program, three 4,800-TEU ships booked at Korea's Hyundai Heavy Industries. Each

ship will sport a seven-cylinder version of the 98 cm design, which develops 54,460 bhp at 94 rpm. The selection was reportedly influenced by the engine's shorter length, which releases additional space for containers.

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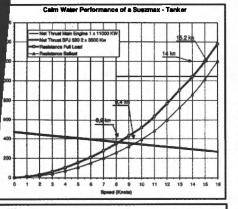
Nacos Sales Hit 500

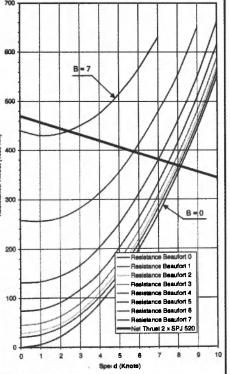
STN Atlas Marine Electronics recorded the 500th sale of its NACOS series of integrated navigation command systems. New orders include six 35-2 systems for container newbuildings at Daewoo and Samsung.

cer can still operate at two to be knots against wind and sea the corresponding to Bf 7, and ship is able to reach eight ots in calm weather. The study esented stated that the investent for the emergency propulon drives, including the electric ower supply, is approximately 1.4 million.

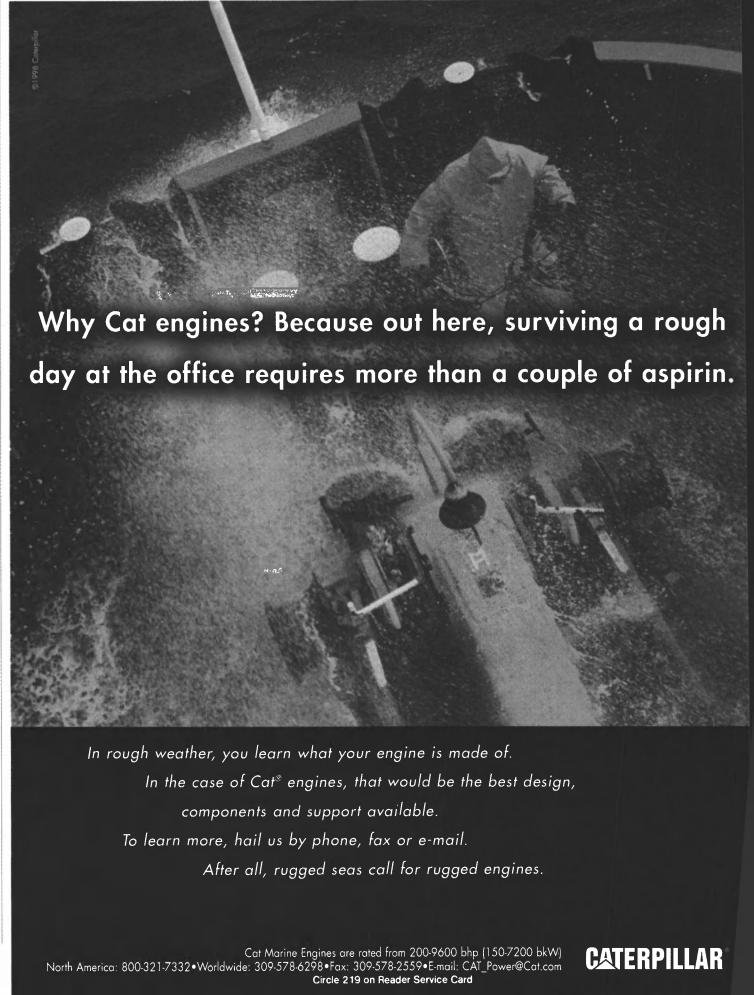
The study was carried out by Fallin Marine Consultants, using naterials supplied by Lloyd's Register, Integrity and Risk Management Dept., Marine Safety Agency, U.K., Shell International Trading and Shipping Co., Marman B.V. and Exmar.

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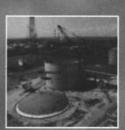


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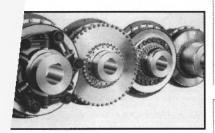
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x Couplings Leave On Market



Fen years ago Centa joined the IM exhibition for the first time d exhibited the highly flexible uplings dubbed Centax. In the usuing decade, the company has applied more than 20,000 Centax ouplings. The line has since gained an excellent reputation and become a market leader.

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Renk Augsburg Celebrates 125 Years

This year the Augsburg works of Renk AG will be 125 years old. Today, with its three production plants in Germany and its four plants abroad, Renk is one of the

Saab To Debut WashTrac At SMM

Saab Marine Electronics and Scanjet Tankcleaning are introducting a new tank cleaning monitoring system dubbed WashTrac, which is designed to enhance the tank cleaning operations onboard tankers of the future. Scanjet Tank cleaning machine will be equipped with a sensor that detects when the machine is running. The sensors will be connected to the Saab TankRadar gauge situated on a particular tank, an arrangment which give the following information to the operators: cleaning fluid pressure monitoring and alarm: cleaning fluid temperature monitoring and alarm; cleaning fluid consumption; and tank cleaning cost calcula-

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MAN Group Division with some 1,700 employees. The core business of the Renk product range includes marine and industrial gear units. The company reports that light gear units for fast ferries and special types of frigates, corvettes and other naval vessels

are in particular demand now, and there is a trend toward higher ratings.

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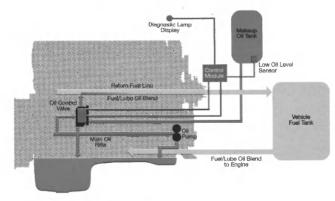
Alfa Laval To Show "Solutions" At SMM

Alfa Laval will exhibit in Hall 5

at this year's SMM '98 exhibition in Hamburg, Germany, and on display will be its line of innovative products concerning separators, filters, heat exchangers, freshwater generators, pumps and fittings. "Solutions beyond technology" is the theme of the company's stand



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SMM '98 preview

this year.

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Geislinger To Show Vibration Dampers And Couplings

At SMM this year Geislinger &

Co. will exhibit several torsional vibration dampers and couplings. Geislinger's steel spring couplings reduce torsional vibrations and protect drive lines from harm due to stress. Also, the exhibit will feature Gesilco couplings and shaftlines, which are made of advanced

composite materials to help reduce weight.

Circle 16 on Reader Service Card

STP Focus Of Schottel Stand

Following the premiere of the Schottel Twin Propeller (STP) at SMM two years ago, the STP has

become permanently entrein the Schottel line-up. power ratings up to 3,600 k' propulsion system is the optition of the complete Scl Rudderpropeller system. Scl will have this and other procondisplay in Hall 12.

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Air Starters With Trouble Free Ops

The TDI TurboTwin engine starters are designed to provi trouble free operation with mo power, and without lubrication the supply air. The TurboTwi starter is made with high-strengt aluminum and steel alloys, thu there is no requirement for any special filtration system.

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New Automation Equipment On Display At SMM'98

An entirely new generation of automation and navigation equipment and echosounders will be the focal point of the Kongsberg Maritime stand at SMM. The stand will feature a collage showing the wide range of products available from subsidiaries Kongsberg Norcontrol, Kongsberg Simrad and Simrad

Kongsberg Maritime's heavy R&D investments over the past few years have resulted in new generations of maritime systems based on the very latest information technology. Kongsberg Norcontrol will be launching the next generation of automation and navigation systems for merchant vessels — the new DataChief Kongsberg Simrad's expertise in vessel control systems will be displayed once again. The focus this year will be an integrated system featuring Dynamic Positioning, Vessel Control and Thruster Control. Additional new functions ensure a leading performance in the market for the positioning of purpose-built vessels such as offshore supply ships, shuttle tankers and cruise ships.

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lie Towing Chugs Ahead With Diversity Perseverance

olle family has been operating tugs on the Mississippi River since 1878, but they are not content to just rest on their historic laurels.

1878, Captain H. Colle ght the first tug, Fox, to agoula, Miss. to assist the ng vessels across the bar and the river to load lumber for ort.

Nearly 100 years later, in 1976, lle Towing introduced the first peller tug to the Gulf Coast, abel Colle. Clearly, Colle Towing not a company that has survived or 120 years simply by maintaining a status quo.

In fact, according to Captain John Colle, Jr., president, and the fourth generation of management, one of the largest obstacles

in the company's history was the death of his grandfather in 1955.

"The estate taxes tore us apart," he says. "It broke up the family, nearly broke up the company. Things had to be divided between inlaws."

Nevertheless, the company has progressed a long way since Fox, the charcoal, iron hull, steam tug, fired by a wood burning boiler.

Now the company has a fleet of eight vessels, following delivery of *Kimberly Colle* from Main Iron Works, Houma, La., later this month. Vessels include shipdocking tugs, coastwise towing vessels, barge-moving tugs and a few deck barges, mainly leased out as construction type barges.

Over the years, the company has seen several regulations — mainly pertaining to safety. They have managed to comply with each.

"We are an AWO Waterways [American Operators member; we're qualified under the Responsible Carrier Program," says Colle. "That program helps us all to be better operators - it focuses on management, safety onboard the vessel, training - it really addresses the indepth operations of vessel management. Even still, it took us a year-and-a-half to qualify."

As a result, the company upped its attention to training, a niche that Colle readily admits was neglected previously.

"I think training is neglected industry-wide," he says. "Most training is OTJ — on the job — that's all anyone ever did before.

"But now, we send people to a qualified school, and we hold programs in-house for regular, routine training. We send people to school for a week, and we also hold safety meetings in-house twice a month—they normally last about two hours

each."

Future Considerations and the Fleet

In the Gulf of Mexico, shipyards and tug operators are plentiful. Colle Towing realizes that business may become more difficult to secure. However, according to Colle, "we are looking to maintain our current business, and also to expand our company operations into more coastwise towing."

The new vessel, *Kimberly Colle*, is designed for just that purpose.

Measuring 108 x 34 ft., the vessel is the largest in the company's

fleet. The 5,600 hp boat features a number of innovative electronics, including Furuno FR-8111 and Furuno FR-1932 radar equipment; Robertson AP-45 and Robertson RGC-11 Gyro autopilot equipment; Furuno GP-16106 GPS plotter and Furuno GP-30 GPS equipment; as well as two ICOM ICM-127 VHF and one ICOM ICM-45 VHF radio; one Sea 222 SSB radio and a Datamarine 3000 depthfinder.

Like the other, larger vessels in the fleet – Janet Colle, 90 x 32 ft.; Mabel Colle, 85 x 32 ft; and Natalie Colle, 85 x 32 ft. – Kimberly Colle is installed with EMD 16-645



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engines and Kort nozzles. Both *Mabel* and *Natalie* feature Ulstein Z-drives, while *Kimberly* and *Janet* feature Bird Johnson propellers.

Of the rest of the fleet, Jim Colle, 85 x 27 ft., and J H Colle, 80 x 28 ft., use GM 16-149 diesel engines with an open screw design;

and Capt. H Colle, 65 x 22 ft, and C McVea Jr., 65 x 24 ft., utilize GM 12-71 engines with an open screw design. All four of the smaller vessels feature Bird-Johnson propellers. Colle Towing has used Main Iron Works for years; in fact, Kimberly Colle will be the fifth ves-

sel built by Main Iron Works for the company since 1976.

Still, in 1992, the company built its own vessel, and has another vessel currently in construction.

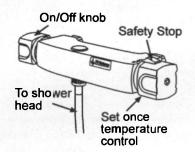
"We get business because we do a better job than most people. We have better maintenance of our equipment," says Colle. "In we built a Z-peller tug and it the first in the Gulf of Me Now, they're the most popular we were one of the first compa to have one.

"We pretty much maintain our own vessels," he adds. "We totally self dependent. We have cown repair facilities, our own d dock and our own shipyard. We all our own repairs on our vesse Basically, everything that cabreak on a boat, we can fix." — l Chris Palermo

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Halter Delivers Newest USN Oceanographic Survey Ship

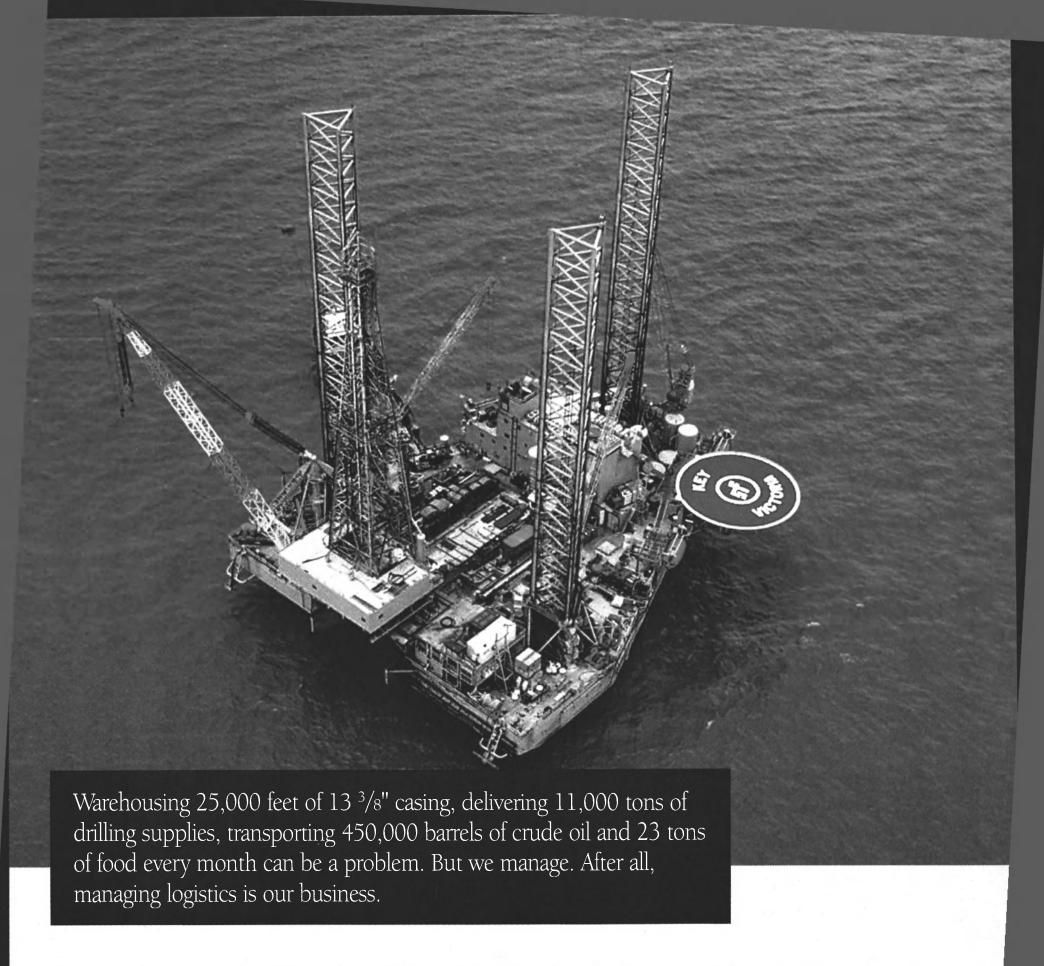
Halter Marine Group, Inc. delivered USNS Henson (T-AGS 63), the U.S. Navy's newest oceanographic survey ship and the fourth of the T-AGS 60 class designed and built by Halter Marine. The ship was preceded by USNS Bowditch, USNS Sumner, and USNS Pathfinder. The 5,000-ton ship, equipped with the latest survey technology, is designed with a common bus diesel electric propulsion system consisting of twin screw propellers driven through Z-drives. The drives include gear reduction and 360-degree thrust direction control in a compact unit. Two diesel generators, one rated at 2,435 kW and the other at 1,825 kW are integrated to provide power to the propulsion system, ship's service, and laboratories through a power conditioner. Propulsion power is derived from two GE 4,000-hp DC motors for a sustained speed of 16 knots.

Circle 22 on Reader Service Card

First Wave To Modify Diamond Offshore Rig

Diamond Offshore (USA) has contracted a Galveston-based subsidiary of First Wave Marine Inc., for modifications and upgrades to its semi-submersible rig, Ocean Prospector. The value of the contract was not disclosed. According to Frank Eakin, President of First Wave, "We have performed well on all of our rig projects to date, and rig contractors are taking notice of our excellent service and convenient location. We are excited to add Diamond Offshore to our base of rig customers as we steadily grow this segment of our business.

Maritime Reporter/Engineering News



When Crowley Marine Services de Venezuela, a subsidiary of CMS, was selected by a multi-national oil company as its integrated logistics services contractor it was done with two goals in mind. Reduce their costs and assure top Health, Safety and Environmental performance. Under normal circumstances a difficult assignment. What made matters worse was that this remote region had little infrastructure and shallow waters. However, Crowley's capability for problem solving eventually won the day.

Today, Crowley's responsibilities begin at vendor premises for Venezuelan-originated cargo and at the port of entry for international cargo encompassing the full range of freight and cargoes bound for the oil company's installations. Crowley also handles everything from crew rotation to transporting the oil for export. All done while achieving ISO-9002 certification of marine operations in less than one year from start-up. While others search for answers, at Crowley, we supply solutions.

For further information call Bill Scott at 1-800-248-8632.





Shell Forms Global Technology Commercialization Venture

Shell has established a new organization, Shell Technology Ventures (STV) to spearhead rapid development and deployment of Shell's exploration and production technologies. STV marks the first globally coordinated effort by the

Royal Dutch Shell/Group of Companies to directly participate with service industry partners in the development and marketing of Shell's proprietary technologies.

STV's mission is to create equity investment opportunities for Shell

in the form of joint ventures and new subsidiaries. **Bill Dirks** is president of STV.

An example of this new approach is the recent agreement to form a joint venture with Halliburton to market Shell's Expandable Tubular technology.

This effort involves novel approaches to drilling practices that are designed to significantly reduce drilling costs and enhance access to oil and natural gas reservoirs.



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Offshore Africa Heats Up With Demand For Gabon Data

Some 16 oil companies reportedly bought seismic information relating to 13 ultradeep blocs off Gabon in a recent government offer. The data were compiled in a study conducted by Schlumberger Geco-Prakla and have been made available by the government in an attempt to stimulate interest in its ultra-deep deposits. Gabon is expecting to produce 18.3 million tons of crude oil in 1998, and is looking to the deep offshore deposits to keep the oil flowing well into the next century.

Mobil To Increase Equatorial Guinea Production

Mobil Corp. plans to increase production from the company's operations in Block B offshore Equatorial Guinea. The announcement coincides with the start of the 1998 exploration drilling program in Block B with four wildcat wells expected to be drilled before the end of the year. An additional drilling rig, the *Percy Johns*, has recently arrived. Planned facilities include a fixed drilling and production platform installed in the Zafiro area and the addition of gas lift and water injection facilities to the existing *Zafiro Producer* FPSO.



A New Approach To Scale Removal

Schlumberger Dowell introduced the Scale Blaster service, touted as a true breakthrough in downhole scale removal technology. The new service offers a clear solution to a previously unsolvable problem. The scale removal system, coiled tubing conveyed, uses fluid jetting and abrasive jetting technology, offering several advantages over mechanical removal methods, including cleaning of tubing jewelry (gas lift mandrels, sub sea safety valves, etc.), through-tubing cleaning of liners and casing, and cleaning of high-temperature deposits. The jetting system removes soft organic wellbore deposits by jetting with water or chemicals, soluble scales by jetting with acid, and hard inert scales by jetting with abra-

The Scale Blaster service removes even the hardest scale, such as barium, strontium and iron sulfate, so that there is no need to kill the well and pull the tubing. A rotating nozzle provides 100 percent coverage, cleaning nipple profiles and completion hardware, as well as the tubing wall. This eliminates the risk of damage to the tubing and downhole jewelry.

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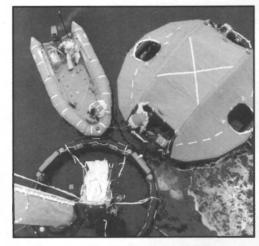
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Maritime History

Ship Restoration Project Commences In Ireland

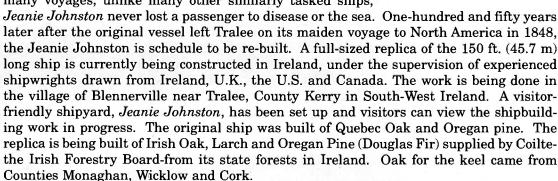
Between 1845-1850, the Great Potato Famine created a mass exodus from Ireland, forcing two million citizens to board ships in search of better lives in the U.S. *Jeanie Johnston* was perhaps the most famous of these ships that sailed away from the emerald isle and now a major effort is underway to restore the ship to its original glory.

The ship was built in Quebec City in 1847 by the Canadian shipbuilder John Munn (1788-1859) for the Donovan family of Tralee. Constructed of oak and pine, the *Jeanie Johnston* was a 408-ton triple-masted barque. The vessel served a transporter of passengers and supplies. During its return voyages to Ireland, *Jeanie Johnston* brought with it badly-needed famine relief. A typical cargo load consisted of 360 tons of Indian corn, 1,000 barrels of flour, 1,100 bags of yellow meal and 30 tons of wheat seed.

The crew of Jeanie Johnston possessed a rich history of the Irish emigration. Almost all of the ship's crew list survived, providing valuable information on the conditions for sailors on the North Atlantic route. The ship's crew typically consisted of 17 members, along with two apprentices. They came from all parts of Ireland, U.K., Continental Europe, Canada, the U.S. and South America. The master of the ship was Capt. James Attridge, a member of the famous seafaring family from Castletownsend in Co. Cork. The ship's doctor was the respected Dr. Richard Blennerhasset, a product of the famous Edinburgh University Medical School.

Tragedy came to Jeanie Johnston two years after the vessel was sold to William Johnson in 1856. On October 31, 1858, the ship became waterlogged in the Mid-Atlantic and sank slowly. Fortunately, there was adequate time for the crew to be picked up by the Dutch ship, Sophie Elizabeth, which was en route to New York. During its Jeanie Johnston.

many voyages, unlike many other similarly tasked ships,







On May 1998, Irish President Mary McAleese laid the ceremonial keel of the new ship. The project's expected time of completion will be two years at a total cost of \$6.5 million. The Jeanie Johnston replica project is being supported by the Irish Government, European Union, the International Fund for Ireland, and Friends of Ireland. Major corporate sponsors include the pharmaceutical company Elan Corp. plc, the Kerry Group plc, the Brandon Hotel, Garvey SuperValu Group, Lee Strand Creamery and many other smaller sponsors in County Kerry and Ireland.

The Jeanie Johnston replica ship is scheduled to make its Millennium Voyage in April 2000, retracing the route followed by the Irish emigrant ships. It will spend two years visiting ports along the Eastern seaboard of North America. The vessel is then expected to return to Ireland in the Fall of 2001. After its final voyage, the vessel will be berth at Blennerville Quay, the old Port of Tralee, as a floating museum exhibit and visitor attraction.

Maritime Reporter/Engineering News















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Keeping Vessels At Work, In Touch

Today, more than ever before, advances in communication technology are helping vessel owner/operators run more efficient, cost effective, and safe vessels.

The advent of higher technology in the maritime communications services and products niche is owed largely to the ever growing needs of land-based corporations and consumers, which constantly push the technological envelope in terms of speed and size. While the maritime market is often considered conservative - particularly in terms of new technology and/or added expense - it is worthy to note that the very core of the industry is changing, moving towards larger fleets. While this trend has ramifications across the board, it means that the price of incorporating new communications technology is viewed more as an investment than an expense.

Consolidation of owners and fleets has touched every aspect of maritime business, from the large oceangoing fleets to the smaller brown-water groups. As companies continue to grow larger, with increased amounts of service affiliations and requirements, it is more critical than ever that entire fleets are outfitted with which technology enable owner/operators to best utilize their assets efficiently and cost effectively.

While satellite and other communication advances have helped to drastically improve the efficiency of fleets, another topic driving change — safety — is equally important in ascertaining a vessel's product and service needs.

Setting the new standard

On July 23 the IMO's sub-committee on Safety and Navigation (NAV 44) overwhelmingly approved an amendment to

Well Said...

"However, as the Chain of Responsibility clearly illustrates, ship and shore are totally dependent on one another when vessels are navigating in confined spaces close to shore and whether entering or leaving port. Well timed communication through VTIS systems must ensure the necessary safety of navigation."

- Dagfinne Lunde, managing director of Intertanko, discussing the court proceedings in Singapore relating to the Orapin Global and Evoikos incident last October in the Malacca Straights.

existing ECDIS performance standards which will allow ECDIS navigation systems to operate in a RCDS mode.

Under the proposal, national maritime administrations may allow vessels the option of using the RCDS mode of operation until the vector Electronic Navigation Chart (ENC) coverage required for the normal mode of operation is available. While operating in the RCDS mode, vessels will be required to use an appropriate folio of paper charts, as determined by national administrations.

Raster nautical charts already cover much of the world and the concept of ECDIS operating in an RCDS mode is seen as a way of letting mariners maximize the use of the system while ENC coverage expands — commonly referred to as the "dual fuel" mode of operations. The important benefit of the dual fuel approach is that electronic chart navigation based entirely on official and up-to-date charts is available for almost any voyage.

Those questioning why a ruling on electronic charts is at the forefront of a discussion of advanced maritime communications can look to the recently completed ECHO project. The ECHO project, as reported in MR/EN's April 1998 edition, sought to set the electronic chart standard. While the technical specifications surrounding the ECHO project consumes volumes, the main thrust of the project revolves around the timely, efficient and cost-effective creation, distribution and use of the ENC's. Crucial to the project's commercial prospects is the ability of an

owner/operator — onboard the vessel or shoreside — to easily update a given chart using high speed data links. The ECHO project has addressed this need with a streamlined system of getting new and updated charts funneled quickly to the user, while maintaining the highest level of security and data integrity.

The ABC's Of SatCom

While the breadth of satellite communication products and services continues to cause confusion among even the most seasoned industry IT professionals, it's worthy to note the one binding trend: more competition will continue to drive down the price of service and the size of components.

Currently, there are three major Low Earth Orbit communication networks

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der development: Iridium, obalstar and ICO. There are any other planned and discussed, at these three promise to have seemed to be most immediate and lasting fect. (The following profiles were exertly presented in Station 12's ewsletter, On The Wave, Volume

5, July 1998).

Iridium

One of the best known LEOs, Iridium is about the closest to being fully operational. Two-thirds (of 66) of the satellites have been launched, testing (at press time) is

underway and commercial service is to commence later this month. Each Iridium satellite orbits at an altitude of 485 miles, making for very short transmission delay times and subsequently high voice quality. Iridium switches calls within each satellite, relaying calls

from satellite to satellite before bouncing them back. Iridium will offer voice, paging and data services (at up to 2,400 bit/sec) via hand-held terminals.

Globalstar

Developed by Qualcomm and Alcatel, Globalstar seeks to offer voice and data services (at 9,600 bit/sec.) as an extension of terrestrial cellular networks. Globalstar will use a network of 48 LEO satellites to cover the world. Globalstar satellites don't process or switch traffic onboard, as calls are immediately bounced back to a gateway (land earth station) and into the public telephone network. Testing is to commence at the end of this year; commercial service is planned for the summer of 1999.

ICO

ICO is not really a LEO system, as it will enlist a much smaller network (12) of satellites orbiting higher (at 6,500 miles). Together, with onboard call switching, this method makes for an excellent balance of coverage, capacity, quality and equipment size. ICO is being developed as a spin-off from the existing Inmarsat network. It is expected to be offering worldwide voice, data, fax and messaging services by 2000.

Iridium Helps Push Worldwide SatCom Into The Palm

Iridium, which is quickly establishing its global satellite network (see related story on page), has helped — with the assistance of partners Motorola and Kyocera — shrink the size of a satellite telephone into a lightweight handheld unit

The phones have been in development for more than seven years, and their small size is, in large, attributed to the low orbiting satellite constellation being established by Iridium.

Circle 27 on Reader Service Card

Transas Group Adds Latin America

Transas Marine Latin America has completed its first sale with an installation onboard Argentine Fragata A.R.A. Libertad.

The system includes a Transas NaviSailor 2400 ECS with a world-



wide chart collection, radar image overlay and a Navtex receiver interface. Libertad, originally designed for a worldwide voyage, is currently the training vessel for the Argentine Naval College in Buenos Aires.

Circle 28 on Reader Service Card

Nucleus 2 Able To Accommodate "Dual Fuel" Concept

The Kelvin Hughes "dual fuel" Nucleus2 Electronic Chart Display and Information System (ECDIS)

is capable of displaying Raster Navigational Charts and Vector Navigational Charts from official sources. Kelvin Hughes ECDIS is type-approved to the latest standards including IEC 61174.

Circle 29 on Reader Service Card

Sperry Demonstrates Direct Chart Reader For DNC

Sperry Marine and Nationa Imagery and Mapping Agency (NIMA) have successfully demon strated the first Direct Chart Reader for Digital Nautical Charts (DNC). Testing was completed in mid-June, and the Sperry Marine Direct Chart Reader product was "validated by NIMA for accurate reading and display of DNC chart information," said Garnett, a NIMA spokesperson. The Direct Chart Reader software will be integrated into Sperry's Voyage Management System.

Circle 30 on Reader Service Card

C-Map Offers ECDIS Library

C-Map is marketing what it dubs the first complete ECDIS library on CD ROM. The data is coded in a proprietary SENC format optimized for direct use by the onboard ECDIS Computer, a format called CM93 and adopted by most manufacturers of ECDIS sys-

Circle 31 on Reader Service Card

Yeoman Offers "Mouse For Maps"

Yeoman offers "Mouse for Maps" which, when linked to a GP receiver, enables the user, guided by indicator lights, to see where they are on a conventional paper map. The user can point and click the Yeoman mouse on any part of the map to get a GPS guidance to that position. The product targets all users of paper maps.

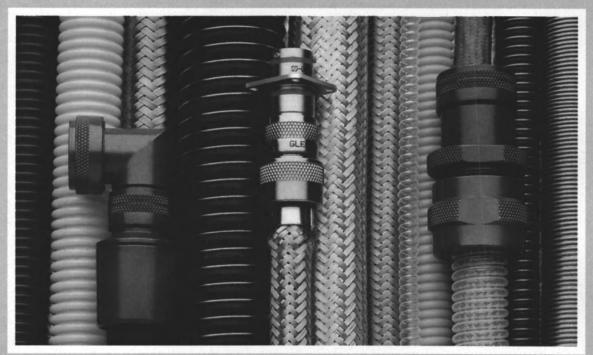
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UKHO Produce New Edition GMDSS Guide

The U.K. Hydrographic Office has produced a new edition Admiralty List of Radio Signals "Global Volume 5: Maritime Distress and Safety Systems." ALRS Vol. 5 is designed to provide all worldwide communications requirements for distress along with the very latest worldwide contact details for all EPIRB registration.

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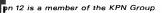




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Your crews benefit too. With special rates that make keeping in touch with their loved ones a practical reality. So whether you want remote access to central computer networks for your ships, the ability to send and receive faxes at sea, or just a phone that will work anywhere on the planet - we can help. With all Inmarsat services in all ocean regions, through the worldwide '12' access code. Satellite-based solutions that guarantee astonishing clarity and reliability.

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Sea Unveils New GMDSS System

Sea Inc. introduced its latest GMDSS product, the Sea 300-A3 Console for Sea Area A3. The 300-A3 is a compact desktop communications suite which meets all regulations for ships required to be fitted with GMDSS equipment by February 1999. Sea has been providing GMDSS products to ships within the high seas, workboat and fishboat community for the last three years, providing installation and service training. The SEA 300-A3 GMDSS console system contains all needed products.

Circle 34 on Reader Service Card

Boatracs Offers Days At Sea Reporting Service

Boatracs recently introduced its newest feature from the Boatracs Network Center: Days at Sea Reporting Service. Beginning Aug. 1, 1998, Boatracs can provide fishing customers participating in the NMFS VMS program with up to date Days at Sea information.

Circle 35 on Reader Service Card

Comsat Offers New Internet Service

Comsat Mobile Communications' new Internet to Telex Service allows any Internet user to message to a ship's Inmarsat A, B or C terminal. It is also available for sending telex messages to Inmarsat A and B terminals, a feature designed to save time and money through the elimination of going through a telex carrier

Circle 36 on Reader Service Card

Raytheon SatCom System Gets Type Approval

Inmarsat has given MagnaPhone — an operation unit of Raytheon Systems Co. — Class 1 Type Approval for the MagnaPhone MX 2464 Plus Inmarsat-B ship satcom terminal.

Circle 39 on Reader Service Card

Fleet Manager Helps Trim Communication Costs

Stamford, CT-based MMS offers a host of advanced software solutions to many different problems, including communication cost and efficiency. Sophisticated compression and bundling techniques built into the company's Fleet Manager Enterprise Communications product have reportedly helped to reduce transmission expenses up to 80 percent in some cases.

The compression techniques are used when transmitting e-mails,

forms and any necessary system data.

The manufacturer claims that analysis by one of its tanker clients showed that cost savings approached \$472,000 per year using the company's products.

Vith Fleet Manager

Enterprise's e-mail interface, shippers can save even more through the reduction of satellite fees. The system allows ship and shoreside personnel to be linked, and the use of e-mail can reduce costs of faxing and telex.

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SAIT RadioHolland Releases Call Logging, Management Software

At the beginning of August, SAIT Radio Holland released a new call logging and management software dubbed @SEA(log) for Windows. The system is designed to provide easy-to-use Windows interface and a fully integrated help manual to assist users to log and report ship-to-shore traffic efficiently and accurately. It also will reportedly help onboard per-

sonnel reduce administrative time.

@SEA(log) includes a sophisticated Least-Cost-Routing (LCR) calculator, which is designed to provide information enabling onboard personnel to select which station to use for the lowest cost of a call for a particular service or

destination. The system is also fully integrated with @SEA(mail), the SAIT-RadioHolland vessel email package, according to Erik Ceuppens.

@SEA(log)'s LCR displays the Land Earth Station used, the airtime cost per minute or per kilobit, the land line coast, the currency amount, and whether the call is peak or off-peak. New features are numerous, and include automatic cost calculation of Inmarsat A/B/C multi-address telex messages, A/B high-speed data simplex and duplex; and radio call logging.

Circle 37 on Reader Service Card

Dataworks Appoints New Distribution Manager

Software specialist, Dataworks (U.K.) Ltd., has appointed **Graeme Brown** as its new distribution manager. Mr. Brown will work with Dataworks' existing international network of agents, and will strengthen the company's market presence and contacts overseas. Prior to joining Dataworks, he spent 10 years specializing in information technology at The Baltic and International Maritime Council.

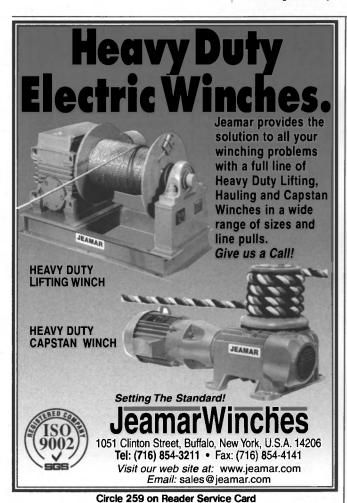
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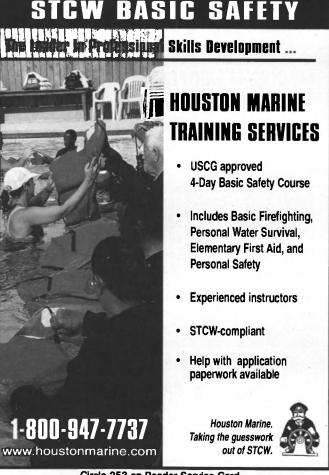
Cunard QE2 Carries Out Safety Exercise With LR

Cunard Line recently carried out an emergency response exercise on board its flagship *Queen Elizabeth* 2, with Lloyd's Register Ship Emergency Response Service (LR SERS), to test the procedures to assist the ship in an emergency involving structural damage. Cunard enrolled its entire fleet in SERS along with the *Queen Elizabeth* 2 in September 1995.

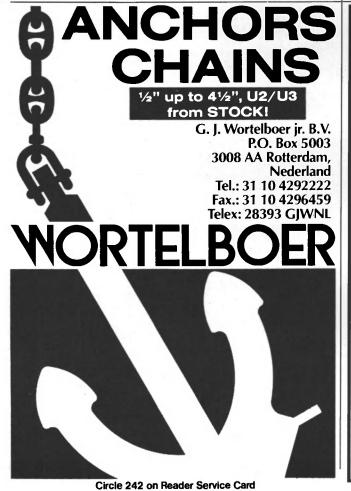
SERS is a 24-hour, 365-days-avear land-based technical support service for ships in the event of an accident. A team of experienced naval architects assisted by a computer model of each ship in SERS, and advanced PC-based damage calculation and simulation software developed by LR, can predict how the stability, strength, oil outflow and floatability of a damaged vessel will respond to various proposed remedial actions. Martin Pittilo was LR's lead surveyor for the QE2/SERS exercise. "Exercises are a practical way of helping to ensure that ship emergencies can be handled smoothly and efficiently," he said.

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Circle 253 on Reader Service Card





Directory Of Major Inmarsat Signatories

Beijing Marine Communications and Navigation Company

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http://www.francetelecom.fr

Morsviazsputnik

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OTE SA

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Singapore Telecom

#02-00 Telephone House
Singapore, 173952
Contact: Tan Tian Seng
Tel: +65 334 7713
Fax: +65 334 6110
E-mail: tstan@singnet.com.sg

Station 12 - KPN International

P.O. Box 30150
The Hague, 2500 GD, The Netherlands
Contact: Anneke Postma
Tel: +31 70 343 7167
Fax: +31 70 343 6913

Stratos Mobile Networks

Suite 1900 Ottawa, Ontario, KP2 1P1, Canada Contact: Dana Seward Tel: 613 230 6910 Fax: 613 230 4212 E-mail: dana seward@stratos.ca

T-Mobil

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Bonn, D-53184, Germany
Contact: Mathias Kretschmann
Tel: +49 228 936 7436
Fax: +49 228 936 7488
E-mail: mathias.kretschmann@t-mohil.de

Telekom Malaysia Berhad

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Contact: Tan Tian Huat
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Fax: +603 731 7899
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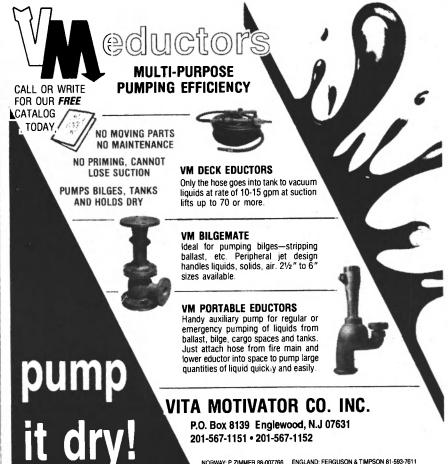
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Oslo, N-0130, Norway
Contact: Jan Thomas Bahnsen
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Fax: +47 2277 7980
E-mail: jan-thomas.hahnsen@oslo.satellite.no

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Videsh Sanchar Bhawan
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PEOPLE & COMPANY NEWS

TECO Announces New VP At Mid-South Towing

TECO Transport Corporation has announced that Gary W. Kovac has been named the new vice president of one of its companies, Mid-South Towing Company. He assumed his duties from former Mid-South vice president, Don Salsbury, who retired after nearly

20 years with the company. Kovac comes to Mid-South from MariTrend, Inc., a privately-held stevedoring company and subsidiary of the Vectura Group, head-quartered in New Orleans. Kovac was MariTrend's president and CEO since August 1997. Mid-South, based in Metropolis, Ill., is a river barging operation that mainly serves the Mississippi,

Illinois and Ohio Rivers. The company is one of the largest open hopper carriers into the port of New Orleans.

DSI Jacksonville Announces New Manager

Daniel Martin has been appointed manager of the Detyens Shipyards, Inc. (DSI) Jacksonville

yard. The yard performs hull, machinery, electrical and outfitting work in both repair and conversion projects, and uses environmentally friendly ultra-high pressure water blasting.

Jesse Engineering on U.S. Chamber's Success Story List

In its recent report, Small Business Success Stories in China, the U.S. Chamber of Commerce recognized 30 small- and mediumsized U.S. enterprises successfully doing business with China. Thomas Donohue, president and CEO of the Chamber said, "We urge our representatives to remember these small businesses ... around the country that have invested people, capital and time into building a trade relationship with China." One company recognized was Tacoma, Wa. based Jesse Engineering Company, a manufacturer of automated machinery such as pipe and tube cutting, welding and bending equipment primarily for use in the shipbuilding, boiler manufacturing and aerospace industries. Darrell Jesse, president and CEO of Jesse Engineering says that "the attractiveness of the Chinese market for us has been due not only to the economic growth there, but also because the shipbuilding sector in China is an international leader in modernizthe industry." Jesse Engineering has been involved with China for eight years.

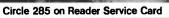
Stidd Systems Joins AAAV Team

Stidd Systems, Greenport, N.Y., manufacturer of ergonomic marine seating, has been granted a contract to develop shock-mitigating crew and troop seats for the U.S. Marine Corps new Advanced Amphibious Assault Vehicle (AAAV) being designed and built by General Dynamics Amphibious Systems, Woodbridge, Va. The AAAV is capable of transporting 18 troops and a crew of three over water at speeds of 32 mph. The design uses a planning hull propelled by two water jets. On land, AAAV will achieve speeds of 45 mph, with cross-country mobility comparable to that of an M1A1 tank.

Prosar Introduces New SOLAS Light

Prosar Technologies, Inc. has introduced a new personal rescue







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56' LCM-6's with Twin 8V-71 GM's with steering
Kort nozzles
Price: \$ 85,000.00 ea. Location: Los Angeles, CA

40' Steel Ex. Model LCM-6 w/o door, decked over bow. Twin 6-71 GM Diesels, bow & stern rubber Price: \$ 45,500.00 Location: Seattle, WA

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PEOPLE & COMPANY NEWS

light, the WARL8-M/1. Easily activated in any marine environment, the ultra bright white light uses a universal attachment system suitable for life vests and immersion

AMC Installs MODU **Mooring System**

Aker Marine Contractors, Inc. (AMC) has completed the design, pre-installation, hook-up and disconnect, in cooperation with Diamond Offshore Drilling, Inc., of the Ocean Lexington's special moorings at the Oryx Neptune Spar in VK-826 in July. The mobile offshore drilling unit's (MODU) special mooring system allowed the rig to drill additional wells at the Spar location while the Spar was moved over to the SW by about 250 ft. on its own moorings. AMC has also completed installation of two taut leg supply boat mooring systems utilizing suction embedded anchors to service the Chevron Genesis Spar in the Gulf of Mexico.

MAN B&W Diesel's **MC Engines Pass** 75 Million BHP Mark

With almost 5,000 engines in service or on order, MAN B&W Diesel's successful MC series have recently passed the 75 million bhp milestone, the last 25 million bhp being logged in three years. The MC two-stroke engine programme offers a choice from 24 engine models of the K, L and S-types, with cylinder diameters ranging from 26 to 98 cm bore and the power range from 1,500 bhp to 93,320 bhp.

Two Stroke MC Engines As at 8/1/1998

	NO. OF MC Type engines	
Bore	On order or delivered	In service
98	7	0
90	159	127
80	424	363
70	647	533
60	1,371	1,162
50	1,082	860
46	24	1
42	192	156
35	906	767
26	167	150
Total	4,979	4,119

Total = 75,373,046 bhp ~ 55,436,875 kW

Two LM6000 Gas Turbines For Schiehallion FPSO

GE Industrial Aeroderivative Gas Turbines (GE-IAD) announced that two LM6000 aeroderivative gas turbines, sold and packaged by Alstom Gas Turbines Limited (Alstom), have started-up commercially on the Schiehallion floating production, storage, and off-loading vessel (FPSO) located 200 km west of the Shetland Islands. Producing some 80 mw of electrical power together, the two gas turbines provide the main on-board

power generation for the vessel. The vessel's storage capacity of 950,000 barrels of crude oil can be off-loaded onto shuttle tankers at a rate of 600,000 barrels per 24 hours.

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New DOT Maritime Administrator Sworn In

Secretary of Transportation, Rodney E. Slater, recently swore in Clyde J. Hart, Jr. as the new Department of Transportation's Maritime Administrator. Mr. Hart fills the position left vacant by the retirement of Adm. Albert J. Herberger. Most recently Mr. Hart has served as senior Democratic counsel for the U.S. Senate Committee on Commerce and Science, and the Department of Transportation's Subcommittee on Surface Transportation and Merchant Marine. Mr. Hart was involved in the drafting of legislation, as well as advising members of the Senate on issues pertaining to the nation's surface transportation and merchant marine industries. Previous to his work with the U.S. Senate Committee, Mr. Hart was involved in various capacities with the Interstate Commerce Commission (ICC).

Bollinger Meets Design Challenges On New Boats

Three of the U.S. Coast Guard's new Marine Protector Class Patrol Boats have been constructed at Bollinger Shipyards in Lockport, La. The USCG requirements for speed and efficiency in law enforcement as well as search and rescue

missions, while also providing for crew readiness at all times, posed some unique design challenges for Bollinger engineers.

The vessels, which will operate up to 200 miles off the U.S. coastline, required propulsion to sustain a maximum speed of 25 knots and a patrol speed of not less than 10 knots; maneuverability at not more than four knots with one engine continuously engaged; accomodation for any mix of male/female crew plus one spare berth; and provisions for a crew of 10 for as many as five days. Bollinger worked closely with the Coast Guard as well as Grace Bauer Interiors to meet the design The 205-sq.-ft. requirements. pilothouse can accomodate the entire crew and provides 360 degree unobstructed visibility under all weather conditions. Crew berthing logistics are solved by having four staterooms, each accomodating two crew members, and one stateroom berthing three. The vessel itself is a combination of a Damen STANS 2600 hull with a stern ramp for rubber inflatable boat (RIB) deployment.

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Leica Opens Service Center

Leica Geosystems, manufacturers of products using the Global Positioning System (GPS), has

Heger Dry Dock To Present Dockmaster's Training Seminar

Heger Dry Dock, Inc. will present their Dockmaster's Training Seminar this November in Jacksonville, Fla. The four day course is designed to present the latest information on dry docks and drydocking techniques to dockmasters, marine engineers, naval architects and others involved in the docking of vessels.

Subjects to be covered during the seminar will include: dry dock accidents, types of docks, ship characteristics important to drydocking, calculating block loads, stability of ship and ship/dock system, blocking construction, docking plans, docking proceedures, vessel handling, pumping plans, dry dock inspection, rating of dry docks, case studies and typical predocking calculations required for U.S. Naval vessels. Also included will be a tour of Atlantic Dry Dock Corporation's 4,000-ton and 1,200-ton marine railways. The course will run from November 17 - 20, 1998; tuition is \$650. For more information or to register, please contact: Heger Dry Dock, Inc., 13 Water Street, Holliston, Mass., 01746. Tel: (508) 429-1800; Fax: (508) 429-1811.

announced the opening of an east coast service center in Ft. Lauderdale. The center will house a complete stock of spare parts and provide full warranty service, both features that will, according to Stuart Tolman, Leica Marine GPS Sales Manager for North America, "significantly reduce turnaround times by avoiding the need to ship products back to our factory in California for upgrades or repairs." The service center will be managed by Jake Marantz, formerly the U.S. sales manager for B&G Marine.

Servomax Appoints Latin America Sales Manager

Servomax, a manufacturer and supplier of gas analysis products, has recently appointed Mr. Todd Newell as regional sales manager for Latin America. Mr. Newell's education and prior experience have been focussed on this region. Mr. Newell will be based within the Servomex headquarters in Norwood, Mass.

P&O Nedlloyd North America Appoints Windfield

Paul Windfield has been appointed executive vice president and regional general manager of P&O Nedlloyd North America, effective immediately. Mr. Windfield's responsibilities at the headquarters in East Rutherford, N.J. will include customer service, operations and regional finance, and sales' activities. Mr. Windfield served previously as senior vice president of the Pacific Trades, with responsibility for managing

the company's North American Transpacific services.

CMT Appoints Leaders For New Breakbulk Division

Crowley Marine Transport (CMT) has announced three new appointments: Bruce Harland as general manager of the new breakbulk carrier division, Kathryn Huesman as freight services manager, and Thomas Stallings as manager of marketing and sales. Mr. Harland, who will be responsible for all day-to-day activities of the new division, previously served as general manager for term contracts for Crowley Marine Services (CMS). Huesman served as director of operations, Northeast, for Crowley American Transport (CAT) before joining CMT. Stallings, former director of corporate sales for CAT, will be responsible for all sales and marketing activities.

ACBL Announces Changes

American Commercial Barge Line Company has announced several new appointments. James F. Farley, previously vice president of Distribution Services, has been named vice president of Liquid Services. The previous director of Bulk and Steel Sales, Peter L. Kazunas, has been appointed as the assistant vice president of Distribution Services. David A. Lewis, former systems planner, is now the director of Fleet Planning. Tim Allen has been promoted from manager to director of Liquid Sales, and Alan Roach has been promoted from Liquid Sales manager to Liquid System planner.

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BMI Announces New COO

Daniel H. Romanchuk has been appointed COO for Baltimore Marine Industries, Inc. (BMI). Mr. Romanchuk had previously served as the Operations VP for Hopeman Bros., as well as the Production Manager and Administrative Manager for BethShip. "His arrival is particularly well timed to coincide with our entry into the barge construction market as a complement to our ship repair and overhaul business," said the President and CEO of BMI, David Watson.

Kvaerner Installs Autoship Systems Company-Wide

Kvaerner-Polar Design of Vancouver, BC, is the most recent of the company's offices to purchase and install the Autoship Systems for hull design (Autoship), intact and damage stability (Autohydro), and plate expansion (Autoplate). The systems have also been installed in eight other Kvaerner offices throughout Norway, Finland, and England.

Circle 103 on Reader Service Card

Chevron And ARCO Agree On Alaskan Oil Exploration

Chevron U.S.A., Inc. and ARCO Alaska, Inc. have signed two agreements which provide equal ownership of recently acquired leases for the North Slope of Alaska. The first agreement concerns leases acquired by the companies during Lease Sale 87, the state's first area-wide lease sale. Chevron and ARCO will each own 50 percent interest in 35 tracts of approximately 200,000 total gross acres located southwest of the Kuparuk and Alpine oil fields. The second agreement gives the companies 50 percent interest in 16 tracts of approximately 196,000 offshore acres north of the Prudhoe Bay oil field in the Beaufort Sea.

Olympic Tug & Barge Receives New Parent Co.

Harley Marine Services of Seattle, Wa., has become the new parent company for Olympic Tug & Barge, Pacific Coast Maritime, and Westoil Marine Services. As part of the new corporate structure, Vince Godfrey has been named president/CEO of Olympic Tug & Barge, with Captain Rod Gullickson as vice president/general manager. Todd Prophet has been promoted to vice president and CFO of Harley Marine Services, and is joined by Captain Russ Johnson as operations services manager, and George Clark as manager of safety, regulatory and environmental affairs. The

new general managers of Pacific Coast Maritime and Westoil Marine Services are **Don Meberg** and **Walt Partika** respectively.

New VP For Bachrach, Wood, Peters & Associates

Bachrach, Wood, Peters &

Associates, Inc. has announced the appointment of **Steven Bahnsen** to vice president, Morgan City Operations in an effort to take advantage of the growing oilfield activities in central La., as well as to de-centralize operations from the company's corporate headquarters in Metairie.



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The advent of computer technology has significantly aided and excelled the introduction of new and innovative ways in which to design, build, outfit and maintain ships and boats. The ensuing section is dedicated to the latest products and services geared toward making the life-cycle process more efficient and cost effective.

High-Tech AC Hits The High Seas

As both cruise operator and cruise passenger can attest, a cruise ship's air conditioning system is arguably one of the more critical comfort function systems. Thus, the securing of a high-value, high-profile newbuilding reference is of particular importance in ensuring a product or system's long-term acceptance. Following successful test installation of Monovent onboard different cruise ships, ABB Flakt Marine won a prestigious order for more than 2,000 Monovent units to be supplied to Star Cruises for new cruise liners being built at Meyer Werft in Germany.

The new Monovent single duct VAV air terminal unit features the latest in sensor and electronic technology. It has an integrated flow sensor that makes tedious adjustment work unnecessary, and ensures the correct air flow irrespective of varying supply air pressure.

A mini-flow function is designed to reduce the airflow when the balcony door is opened, helping to conserve huge amounts of energy that would otherwise be wasted. Up to four Monovent units, connected to a common duct system or to separate ducts with different supply air pressure, can be controlled by one control panel, a useful function for larger areas in need of superior air distribution. Monovent is type-approved by DnV and LR.

Circle 199 on Reader Service Card

BMT Employs State-Of-The-Art Earth Observation Techniques In Product Development

British Maritime Technology Limited (BMT) has identified for commercial development two new global information products for the maritime market, products that could potentially greatly aid the safety and efficiency of ships at sea.

The first product is an integrated wave climate database, designed to provide more comprehensive data on wave heights, frequency and swell than current systems. BMT believes that the data would be of particular value for naval architects in designing new vessels; for offshore engineers planning production systems with the continued move towards production in deeper waters; and for coastal engineers planning coastal defenses with rising sea levels. The second product is a new and innovative operational procedure for the production of bathymetric charts, which measure depth, based directly on Earth Observation data for coastal waters. Bathymetric charts are essential to all sectors of the maritime industry and currently can only be produced via hydrographic surveys. Due to cost and time involved in this method, it is estimated that approximately 30 percent of existing global coastal

New Version Of Catia Offers Valuable New Teels

An innovative CAD/CAM solution has added to its capabilities, with the recent release of Catia-CADAM Solutions Version 4, Release 2.0. The system is utilized by top design and construction firms in a variety of industries — notably Finland's Deltamarin and Germany's Meyer Werft — and the new version offers three new and 37 enhanced products designed to make the system a greater efficiency enhancement tool.

The new Version 4, Release 2.0 supports customers from 2-D drawings to digital mock-up methodologies and notably, expands customer competitiveness and productivity in manufacturing, analysis and mock-up.

"We use Catia to design internal areas, such as the bridge and the galley, along with the actual hull, deck structure and propulsion systems," said Juhani Kivi, vice director of EDP with Raisio, Finland-based Deltamarin. "With Catia's 4-D Navigator and the significant enhancements in the Catia-CADAM Shipbuilding Solutions, more than ever we can present an easily visualized end-to-end solution to the ship owners."

While the Catia system is designed as a multi-industry support solution, the Release 2.0 of Catia-CADAM Shipbuilding Solution is designed to bring shipbuilders and suppliers an integrated "end-to-end" or "concept operation" solution, with extended modeling features, industry standard support and new generative capabilities in the ship hull steelwork design product. The system disciplines

Catia-CADAM, created by Dassault Systems and marketed, distributed and supported by IBM, offers ship designers and builders a complete process system. Finland's Deltamarin uses the system for a variety of uses, including internal areas such as the bridge and galley. The following are some examples of the system's work, courtesy of Deltamarin.

are designed to cooperate through the product's life cycle, from initial hull design through outfitting. It is designed as a common base for design, configuration management, manufacturing, commission, maintenance and operations.

Another of the new products offered in the upgraded package is the Lathe Machining Programmer, which provides extensive turning designs for such operations as roughing, grooving, threading and finishing. The new release also offers full integration across all Catia manufacturing product suites to enable mixing mill, drill and lathe operations in a seamless fashion.

The new release increases the productivity of drawing creation through 2-D view sketching with ease-of-use features for automatic drawing layout, automated view positioning and faster annotation.

Other system enhancements include: the capability to generate the 3-D solid representation of composite material parts and integrate the representation within a digital mock-up; and the extension of Catia 4-D Navigator, the tool for digital mock-up inspection and simulation, to become CAD independent to support access to any CAD system.

Peter Motikat, technical director at the well-respected Meyer Werft facility in Germany, a shipyard that is known for its adherence to the latest technological trends and systems, had this to say about the system: "Since 1989, we have been using Catia extensively in designing our ships, including one of the largest cruise liners in the world."

"We go beyond such things as general arrangement, structural steel, HVAC, piping accommodation and electrical design, and use Catia for such crucial features as on-board shopping malls, swimming pools and entertainment centers."

Catia-CADAM is from Dassault Systems, and is marketed, distributed and supported by IBM worldwide.

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Arco Replaces Wire Rope For Tanker Fleet

In its continual quest to raise the bar of safety and efficiency, Arco Marine Inc. initiated a two year test of Spectra Fiber-make ropes in place of traditional wire rope for the docking lines for one of its tankers. After more than two years, Arco reported that the lines Whitehill supplied by Manufacturing Corp. and made of Spectra Fiber not only provided essential strength and durability, they also helped increase safety for its personnel. In fact, the company was reported to be so pleased that it replaced the steel-wire lines on all nine of its oil tankers with the new lines.

To quantify the benefits, Arco conducted its own in-house survey and found that back injuries attributed to wire rope mooring

(Continued from page 74)

charts are of poor quality and outdated. The new technique uses earth observation data from satellites, and reportedly provides a lower-cost option for mapping coastal water depth. The system could prove useful for assessment of new coastal facilities in developing countries, as well as providing a method for updating old coastal charts.

Eye In The Sky

As interesting as the new products prove to be, it is perhaps even more interesting to find out how they were developed. The products arose from a research evaluation program for the maritime industry in conjunction with Dutch partner ARGOSS, and funded by the European Commission's Center for Earth Observation.

The maritime information products exploit Earth Observation data from a new generation of microwave sensors which have come into practical use for commercial applications in the 90s.

Earth Observation data comes from sensors on satellites which measure the electromagnetic radiation, either from natural radiation or from transmitted signal reflections. Different sensors operate in the visible, thermal or microwave parts of the electromagnetic spectrum.

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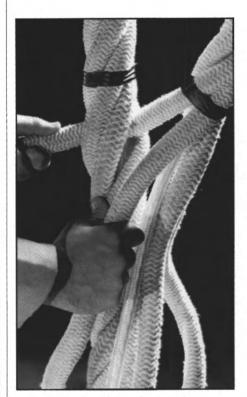
lines were reduced 100 percent. The study also found that the new Spectra Fiber ropes helped reduce docking time, in some cases up to 60 percent. The company reports a docking time of between 60 and 75 minutes with steel wire ropes, while the Spectra Fiber ropes allowed fewer people to perform the task in less time, a reported 30 to 45 minutes.

Spectra Fiber, developed by AlliedSignal Inc., is reported to be 10 times stronger than steel of equal weight. The cordage is lightweight, naturally buoyant and resistant to wear-and-tear and degradation from water and most chemicals, as well as from ultraviolet radiation.

Arco's Prudhoe Bay and Sag River ships tested Whitehill's VETS 276-5, a four-strand, two-in. diameter Spectra Fiber rope with a 230,000-lb. minimum break strength. George McShea, Arco's manager of vessel operations, said that the Spectra Fiber-based ropes

have tested at 96 percent of their rated break strength. In addition, Arco tested the line on tankers that dock every seven or eight

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Developed by AlliedSignal, Spectra Fiber is reported to be 10 times stronger than steel of equal weight.



Arco tested Spectra Fiber lines in place of traditional wire rope for docking its tankers. After two years of testing, the company switched its nine-tanker fleet to the new lines, as it found that they helped in increasing safety and productivity.



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dimensions, thereby enabling a larger fluidization system and high deadweight of 6,150 tons. The transport speeds. The compara-





Merewido Europe has fitted M/V Atlantis with a pneumatic system for loading/offloading

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357.6 ft. (109 m) ship carries cargoes of cement from seaports on the Portuguese coast to Madeira and the Azores.

The loading/offloading system for dry powder material installed on Atlantis developed by Merewido.

Main elements of the system are a suction/delivery system with filter tank, four aeration floors fitted with synthetic cloth as a fluidization mat in two separate holds, operating and control panels linework.

The system has a capacity of 600 tons/hour loading and 200 tons/hour offloading.

The system is constructed with high-density fluidization tanks equipped with dish-

shaped floors. These special floors give the suction/delivery tanks a larger capacity tively small capacity of the reloader tanks means that the system requires relatively little air.

Each of the vessel's two holds accommodates two aeration floors with a width of about 14 m. The length of each aeration floor in the aft hold is also about 14 m; the length of the aeration floors in the forward hold is about 17.5 and 14 m respectively.

These structures are shaped like an inverted pyramid just over two m in height.

This construction yields the largest possible net hold capacity combined with the lowest possible center of gravity, which benefits the vessel's stability.

In addition, both holds are equipped with shifting boards positioned longitudinally amidships.

The entire system is so designed that 50 percent of the total capacity can remain available at all times in the case of repairs or periodical maintenance.

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Dear Readers:

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CAD/CAM Seminar To Coincide With SMM

There will be a CAD/CAM seminar held September 28 and 29 in the Netherlands for shipbuilders and ship designers. The event is timed so that visitors to the SMM exhibition in Hamburg, Germany the next week can combine events and make efficient use of international travel.

The seminar will focus on the Windows-based MasterSHIP CAD/CAM software, a system which is fully integrated with AutoCAD and used by several shipyards in Europe, Asia and the U.S. The seminar will be structured to maximize the amount of information covered, and will include fairing of 3-D lines plans, construction drawing in 2-D and 3-D, lofting and preparation for NC cutting, as well as a discussion on the integration of the ship engineering process and CAD tools. On display will be the system's latest timesaving modules for automatic nesting and parametric drawing.

The seminar will shift on day two to on-site visits to two shipyards and a cutting center, so that visitors can see the CAD/CAM system in operation.

The seminar is organized by Yachting Consult, the Dutch specialist in CAD/CAM software and engineering, and will be given in Eindhoven, the Netherlands. For information and registration, contact Yachting Consult's Mimi Pang at fax: +31 40 244 61 37; or e-mail: 101612.32@compuserve.com.

BMI Storms Back Into Repair Business

Baltimore Marine Industries (BMI) is enjoying a busy year with a full orderbook extending through the autumn. Seventeen commercial ships drydocked at BMI during the first half of 1998 with an additional nine ships undergoing afloat repairs. BMI currently has five ships in the yard and has firm bookings for three additional ships including two cruise ships.

Since beginning operations in October 1997, BMI (formerly BethShip) has docked 25 ships and completed afloat repairs on 11 ships. One of the yard's more interesting current jobs is the reactivation of LNGCC Matthew after 17 years of lay up. The seven-month upgrade and re-acti-

vation for Cabot LNG Carriers will include a wide variety of work, including the prepping and coating of all exterior surfaces.

Construction On Kvaerner Yard Commences

Re-development work has start-

ed at the new Kvaerner Philadelphia Shipyard, with a recent VIP celebration marking a significant milestone in the project which will transform the former naval yard into a state-of-theart shipyard.

Speaking at the 'building breaking', Harald Rafdal, president & CEO of Kvaerner Philadelphia Shipyard Inc., said: "Today's milestone marks the physical start of demolition and re-development works. It follows six months of detailed planning since Kvaerner's signing of an agreement with the U.S. authorities in December 1997.

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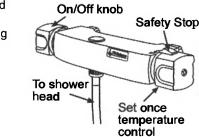
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PEOPLE & COMPANY NEWS

Ulven Names New VP

With more than 14 years of sales and marketing experience, **Jerry Bangerter** has joined The Ulven Companies as vice president of sales and marketing. The Ulven Companies, comprised of Ulven Forging Inc., Brookway CNC Division, Skookum Blocks & Rigging, and Wolf Steel Foundry, manufacture products for timber

harvesting, the oil industry, mining, fishing, and construction.

Dutch Icebreaking Supply Vessels Named in Helsinki

Arcticaborg and Antarcticaborg are the new names of two icebreaking supply vessels built for Wagenborg Kazakhstan B.V. at Kvaerner Masa-Yards' Helsinki New Shipyard. The vessels, due to

be delivered in October, are designed for operation in the northern Caspian Sea, and will be on long term charter to serve drilling platforms Offshore operated bу Kazakhstan International Operating Company (OKIOC). The vessels are equipped with two Wartsila NSD 6L26 1,950 kW diesel engines and are the first newbuildings to entirely follow the "double acting" operating principle developed by Kvaerner Masa-Yards: in hard ice conditions, the vessels sail with the stern first and in open water with the bow first.

U.S. Office for Harbour & Marine Engineering

Harbour & Marine Engineering, the Melbourne, Australia based mooring specialists and suppliers of vessel docking, mooring and monitoring equipment has established an office in Denver, Co. The new office will market the company's onshore and offshore quick release hooks, remote release systems, mooring load monitoring and integrated monitoring systems as well as a laser based vessel docking system, recently acquired from Communications Laser Managing the office will be Dan Grothe, recently named marketing director for North and South America.

Cenal Launches Third Vessel

The DnV 1A1 class trawler *Gollenes* was recently side launched at Cenal Shipyard Co.

Ltd. The steel hulled vessel has an aluminum superstructure, funnel and masts, with a bulbous bow shape to decrease resistance to flow. A special rudder system designed

and constructed by Cenal allow the trawler to steer effectively a low speeds. Cenal Shipyard, estab lished less than two years ago, has nine contracts signed for 1998 at an approximate sale value of \$27 million.

Centa Hires LeCompte

Wayne P. LeCompte has recently joined Centa Corporation as Gulf Coast regional manager. Mr. LeCompte will be working out of New Orleans, La.

New Control For Engine Room Temperature

Delta 'T' Systems has created a new system for maintaining proper engine room temperature and combustion air called the P/T2 Ventilation Control System. A major benefit provided by the digital system is that it operates quietly with no operator interaction necessary. When the engines are started, the new system automatically maintains flow and volume of air for optimum engine combustion and room cooling. Upon engine shutdown, the fans cool the room to the selected temperature. The automatic controls can be manually adjusted at any time and the system features an alarm function to alert operators of any dangerous conditions relating to high engine room temperatures or fire.

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MT&T Reorganization Battle Resolved

After a five year legal battle between Captain Brian A. McAllister and William Kallop, McAllister Towing and Transportation Company, Inc. (MT&T) has reorganized and divided its components equally between the two shareholders. Capt. McAllister, the CEO and President of MT&T, will keep the tugboat and transportation business, while the oil exploration, production and oilfield support businesses will be passed to Mr. Kallop. The company reportedly plans to revitalize the tug and ferry businesses through the additional construction of tractor tugs. Capt. A. J. McAllister has also been appointed VP of Sales.

McAllister Organization Announces New VP Sales

Captain A. J. McAllister III has been appointed vice president of corporate sales at McAllister Towing and Transportation Company in New York. Capt. McAllister will be responsible for ship docking sales for all ports the company services, including New York, Philadelphia, Baltimore, Hampton Roads, Wilmington N.C., Charleston, Jacksonville, and San Juan. Capt. McAllister has served various roles with the company since 1980, including mate, captain and senior docking pilot. McAllister Towing has also announced the formation of a new subsidiary, the Project Cargo Division which will be headed by Mike Ferrara. The new division will focus on improving service in the break bulk cargo transport trade.

Maritime Reporter/Engineering News

PEOPLE & COMPANY NEWS

3ardex Redesigns Transfer System At Request Of ROK Navy

The Republic of Korea Navy has requested that the blocking height of the shiplift and transfer systems at the new Pyungtaek Navy Base be reduced, while still providing clearance for varying sized domes and other projections below the keel line on certain class vessels. Bardex Corporation will modify selected bogic modules and connector links on the carriage, and sit the steel support structure onto the modified cradles to permit the positioning of appropriate wood blocking modules.

Good Results For GL Brazil

Germanischer Lloyd Brazil has reported good results for the first half of 1998. A bulk carrier, a multipurpose ship and 18 inland vessels are currently under construction in Brazil under GL class. In the past five years, according to area manager for South America, L. F. Coelho da Silva, GL has classified two container ships, four multipurpose ships, a bulk carrier, 53 fishing vessels and two service vessels within the main markets of Brazil, Peru, Chile and Argentina. The Brazilian shipping company Empresa de Navegacao Alianca has been certified by GL according to the ISM Code, and 32 companies in Brazil, Argentina and Chile have been certified according to the ISO Code.

ICCL Testified On Environmental Protection Issues

In July, the president of the International Council of Cruise Lines (ICCL), Cynthia A. Colenda, testified before the House Coast Guard and Maritime Subcommittee, a hearing convened to review the U.S. Coast Guard's marine environmental protection programs. Colenda stressed the cruise industry's continued commitment to improving the environment, "not only in principle, but also because we have a vested interest in maintaining the beauty of the oceans on which we sail." Also noted were the strict and comprehensive international requirements addressing protection of the environment, and the strong record of the industry for improving environmental programs and performance.

Chubb Expands Marine Liabilities Offerings

The Chubb Group of Insurance Companies is expanding the availability of its marine liability underwriting facility from the southeastern part of the country to the entire U.S., as well as Montreal and London. Chubb's marine liability products are distributed in the U.S. and Canada by AXIOM Insurance Management. Products are available on either a primary or excess basis and can also provide insurance for non-marine liability exposures.

WESMAR Appoints President And CEO

Western Marine Electronics (WESMAR) of Woodinville, Wa. — designers and manufacturers of sonar systems, bow thrusters and roll sta-

September, 1998

bilizers — have announced the appointment of **Stuart F. Platt** as president and CEO. Mr. Platt was previously the president of DRS Technologies Data Systems Group in Santa Clara, Ca. **Bruce F. Blakely**, president and founder of WESMAR will become Chairman of the Board.

Launching Platform Passes Through Suez Canal

The Kvaerner-built, converted oil rig Odyssey passed through the Suez Canal via Port Said on its way to Long Beach, Ca. Odyssey is a semi-submersible platform which will be used as a launching platform for the first ever ocean-based commercial satellite

launching project, Sea Launch. Kvaerner Corp. also built Sea Launch Commander, the mission control vessel for the Sea Launch project.

Timberland Purchases Almon A. Johnson Inc.

Timberland Equipment Ltd. of Canada has purchased the marine equipment business of Almon A. Johnson, Inc. Manufacturers and marketers of winches, hoists and related material handling equipment for use in the marine, construction, electrical utility and mining industries, Timberland intends to continue to sell marine products itself, as well as through the newly formed company of Almon Johnson Ltd.

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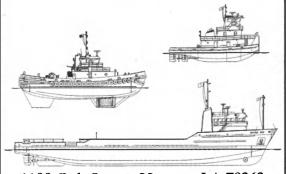
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A farewell to one of the industry's most well known facilities

by Alan Thorpe, international editor

Belfast's
Harland & Wolff
(H&W) Ship
Repair & Marine
Services has
announced that



it is to withdraw from the general shiprepair market. The official reasons are, according to a spokesman for H&W, "as a result of the current strength of sterling against other international currencies, and the over capacity in the basic shiprepair sector. In the immediate future, the company will pursue major higher added value repair, refurbishment and conversion contracts, with the focus on the offshore market and in the cruise sector.

"This re-focusing of the company will result in greater fluctuations in the workforce required to undertake shiprepair contracts and for this reason the company is creating a greater element of personnel flexibility within the entire H&W organization."

H&W's Shiprepair Division has built a fairly good reputation in the

APTMAN

higher end of the repair and conversion markets with contracts such as the Arcadia refit and the re-build of the Sea Empress. A turnover of \$33.9 million during 1997 gave a profit of \$2.42 million, although this did include some \$9.7 million for the Arcadia refit and some of the \$48.5 million for the Sea Empress rebuild. It must also be remembered that the offshore drilling rig, Bideford Dolphin refurbishment project and the Glas Dowr FPSO conversion project were both won by the Shipbuilding Division.

One of the most interesting aspects of this announcement is that H&W will withdraw from the ferry refit market, which includes Stena Line's HSS vessels. At 131.2 ft. (40 m) beam, H&W has the only facility in the U.K. to drydock such vessels.

It is believed that the current workforce employed in the shiprepair business will be reemployed in the shipbuilding division and then transferred back to shiprepair when a large contract is underway.

In spite of continued strong competition from Polish, Latvian, Estonian and Russian shiprepair yards, Klaipeda-based Western Shiprepair Yard has managed to achieve even greater results than in 1997. Total turnover during the first five months of this year, compared with the same period in 1997, increased by more than 20 percent. The yard has made a few considerable investments so far this year, including the acquisition of new steel cutting machines, modifications to workshops, and personnel training.

General cargo vessels continue to dominate the yard's orderbook during this year, with a total of 60

Port Weller Dry Docks was awarded a contract valued at approximately \$600,000 to repair the M.V. Aptmariner. The Liberian-registered vessel grounded in the Gulf of St. Lawrence in late June. Approximately 30 tons of steel will be required to repair the ship, which sustained damage to the bow and forward-most tank. The M.V. Aptmariner is owned by Hong Kong-based China Ocean Shipping Company, and registered in Monrovia, Liberia. The vessel measures 619 ft. (188 m) long and 76 ft. (23.1 m) wide.



Petrobras 37 at Singapore's Jurong Shipyard undergoing FPSO conversion.

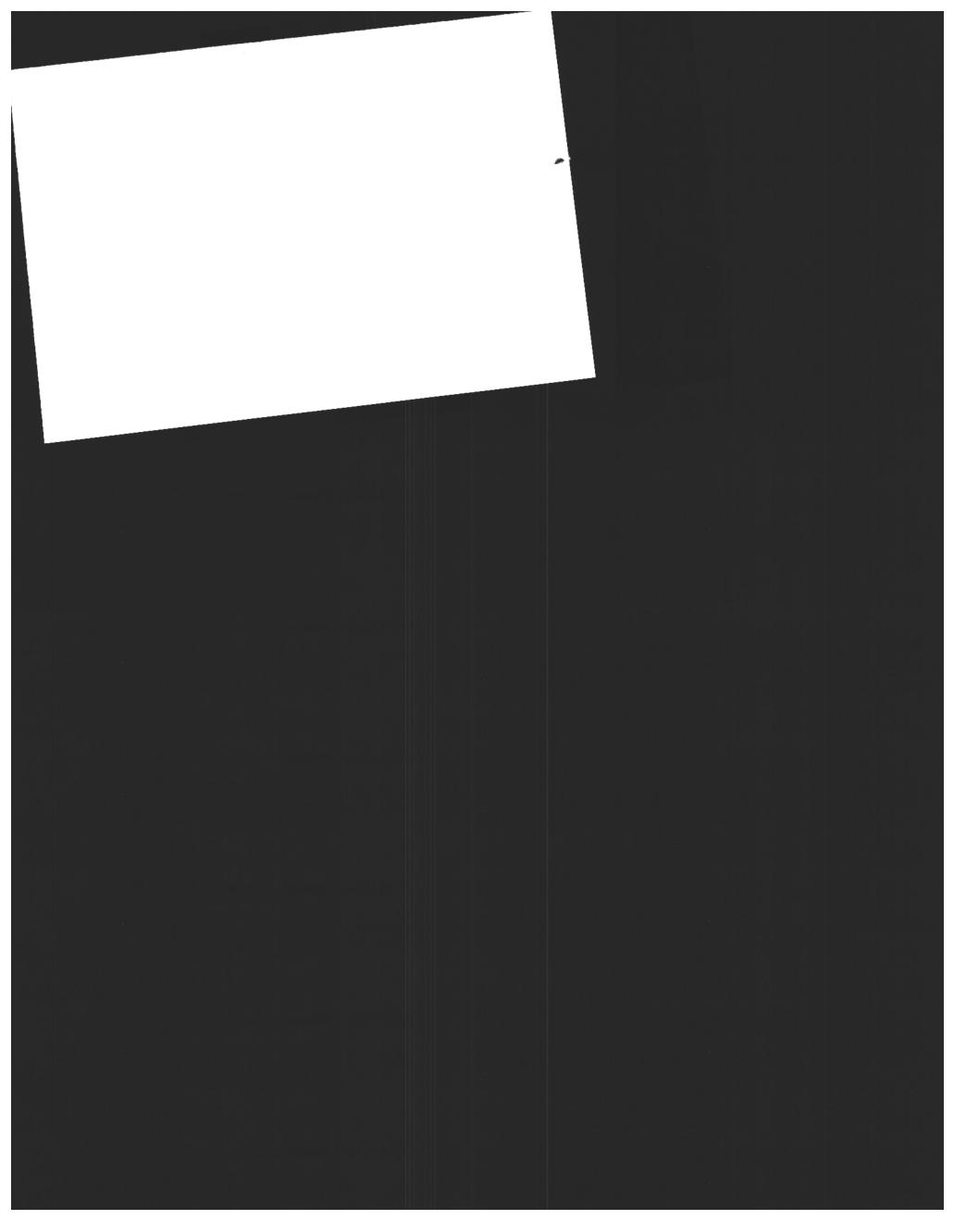
ships being repaired. Among the ships handled at the yard, there were two large fishing vessels, the Atlantic Horizon and Atlantic Challenger, owned by Ervik Marine Services, Norway, and Atlantic Horizon A/S. These ships were converted to seismic research vessels, with the work including large quantities of stripping and steel mounting and renewal work.

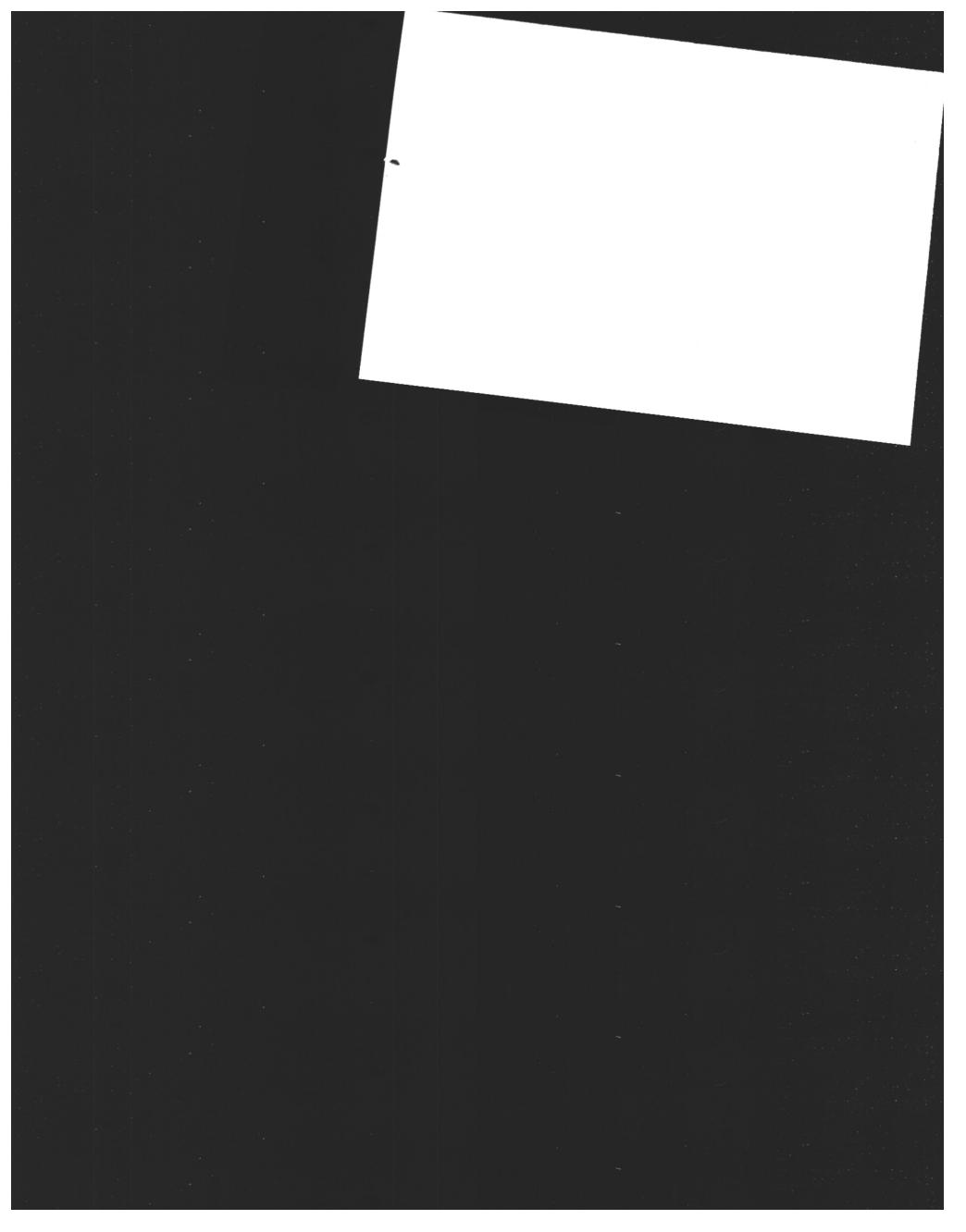
The yard has managed to keep the rate of 12-14 tons of steel mounting and renewal per day. In total 650 tons of steel was mounted onboard Atlantic Horizon and 760 tons onboard Atlantic Challenger. The yard also installed thrusters, main engine and tailshaft, and blasted/painted. Future work at the yard includes lengthening of Erikson's 6,620-grt Finnish RoRo vessel Finnoak. The job entails the installation of a 450-ton steel section. In addition, a new accommodation area was to be built and installed. The contract was expected to be completed last month.

In early June, Sweden's Oresundsvarvet was awarded a Skr65 million conversion contract to convert the 1,000 dwt Russian

supply vessel Svetlomor-1 to a seismic exploratory surveying vessel. The contract involves lengthening the vessel by 49.2 ft. (15m), whichwill give the vessel a length overall of 249 ft. (76 m) after the conversion has been completed. Also included in the contract is the building of a new deck aft and construction of a hanger over the whole aft deck section. In the hanger, the winches and rail system for handling the seismic equipment will be housed. Owned by Nopec International ASA, an affiliate of the Norwegian Norex Group, the vessel is scheduled to arrive at the yard during this summer and be re-delivered this month.

The marine seismic surveying may be carried out throughout the world on vessels ranging in size from 65 to 394 ft. (20 to 120 m). In simple terms, a seismic survey vessel acquires its data by means of an acoustic source generating pressure waves in the sea through to the seabed and the rock layers below. The returns from the acoustic source are measured by a long submerged cable packed with sensitive hydrophones and elec-





SHIP REPAIR & CONVERSION

tronics. This cable is often referred to as a 'streamer.' In this manner, an image of the various rock strata may be obtained.

Other work includes the installation of five new low and high pressure compressors, together with three new 1,100-kW generators. In addition, both main engines will be overhauled and the vessel will be converted to dieselelectric propulsion by the installation of two propulsion motors — as well as two 1,300 kVA generators coupled to the existing main engines. The existing accommodation will be completely renovated and additional cabins, mess, computer and instrument rooms will be built for crew and operators. In addition, new radio and navigational equipment will be installed.

The conversion project involving the 4,641 dwt Swedish-registered chemical tanker CT Sun has now been completed at Poland's Gdansk Shiprepair Yard (Remontowa). Owned by Gothenburg's Brostrom Shipping and managed by Ferm International Ship Management, she, in fact, underwent lengthen-

General cargo vessels continue to dominate the yard's orderbook during this year, with a total of 60 ships being repaired

ing operations, with a 82 ft. (25 m) steel section being fitted.

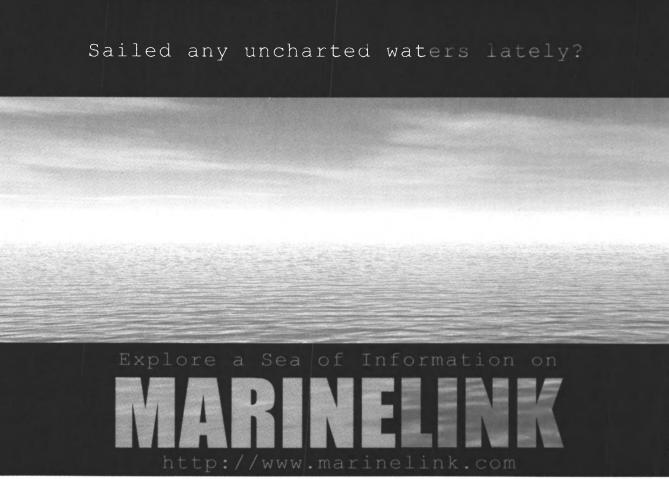
The scope of the lengthening work included: hull extension; lengthening of pipes and cables; installation of new cargo pumps and cleaning equipment; renewal of cargo pipeline systems; renewal of life boats; renewal of high alarm system in cargo tanks; installation of gas detection system; rebuilding of cargo control room; renewal of fire-fighting system (removal of existing halon system and dry power system); and installation of new foam system and new CO2 system.

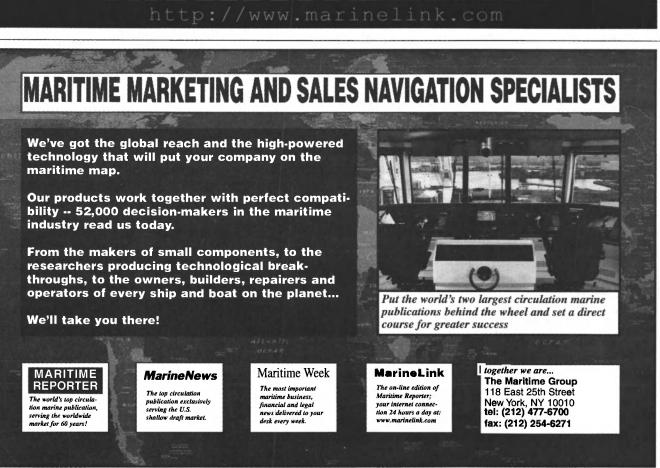
The modification work included repositioning of the deck crane, chain lockers, and the double bottom tank arrangement. Meanwhile, the repair work includes hull blasting/painting, engine room repairs, main and auxiliary and pump overhaul, cooler cleaning, mooring and anchor winch overhaul and ballast and hydraulic pipelines renewal.

During mid-June, Hamburg's

Chiba Shipping's 290,793 dwt VLCC Grand Phoenix undergoing repairs.









The 260,995 dwt VLCC *Mitsumine*, owned by International Energy Transport, undergoing alongside work at MSE.

Blohm + Voss (B+V) was awarded a seven-ship block-booking order from Copenhagen's A.P Moller. All seven ships are part of the owners 60,639-dwt M-Class containership fleet, and include Marchen Maersk, Marit Maersk, Mathilde Maersk, Mayview Maersk, the Madison Maersk, Maren Maersk and Margarethe Maersk. All will undergo drydocking and general repairs. Also part of the A.P Moller fleet, the 84,900-dwt DIS-registered containership Regina Maersk is also expected to arrive at the yard in the near future.

Due to arrive during mid-August was OMI Corp.'s 141,720-dwt Liberian tanker Tanana. The ship is to undergo conversion to a shuttle tanker at Spain's Astilleros de Cadiz, and the contract is expected to be completed by October. With regards to conversion work, the yard, which is part of the Astilleros Españoles Group, is currently carrying out this type of work onboard Foldkoon's

267,577 dwt Panamanian VLCC P-47. Pasir Gudang's Malaysia Shipyard & Engineering (MSE), has completed repairs onboard the 244,651 dwt Panamanian-registered VLCC Diamond City, which is the first in a block-booking from Japan's Navix Corp., involving a total of nine tankers. The next vesdue is the 259,999 dwt Diamond Falcon, expected to be in the yard during July - all the Navix ships due in MSE are chartered to Japan's Mitsubishi Oil. It is expected that the block-booking will be completed early next year.

MSE is also in the process of converting Mowinckles' 94,236 dwt (1984-built) conventional tanker Hitra to a floating production, storage and offloading (FPSO) unit for use off the Malaysian coast by Petronas. The contract was placed with MSE by a joint venture company between Malaysia's Trenergy and Norway's Statoil. The ship arrived in the yard during the lat-

(Continued on page 96)



Hitachi Zosen completes the FPSO conversion of Rang Dong I (ex Proster).

SHIP CONVERSION FOCUS

One Plus One Equals One

New vessel is created from two re-commissioned at Port Weller

The newly created Upper Lakes Group vessel *M.V. Canadian Transfer* was re-commissioned in a ceremony last month at Port Weller Dry Docks. The project involved combining components of two existing ships to create a new one, a complex engineering job completed at Port Weller Dry Docks during the past four months.

"We are proud that the new vessel, which is now equipped with updated unloading gear, deck equipment and electronics, will be 40 percent faster, more maneuverable, and will use less fuel to operate," said Marcel Rivard, President and CEO of Upper Lakes Group Inc.

Canadian Transfer is 651 ft. (198.3 m) long and 60 ft. (18.3 m) wide, with an unloading capacity of 4,000 tons per hour. Canadian Transfer will join the Seaway Self Unloaders fleet, a partnership of Upper Lakes Group Inc., Toronto,

and Algoma Central Marine, St. Catharines, Ont.



Canadian Trans	fer's Main Dimensions
	650.5 ft. (198.3 m)
Roam	£0 ft. (18.3 m)
Depin	
Deadweight	
	6.000 bhp
Cargo copacity	
	4,000 tons/hour

Canadian Shipbuilding & Engineering Ltd. (CSE) is the parent company of Port Weller Dry Docks. CSE is one of Canada's premier shipbuilding and repair companies, with operating divisions at Port Weller, Canal Marine and CSE Marine Services, St. Catharines; Pascol Engineering, Thunder Bay, Ont.; and, Lansdowne Technologies Inc. in Ottawa. M.V. Canadian Transfer was re-constructed at Port Weller Dry Docks, St. Catharines, Ont. from portions of the M.V. Hamilton Transfer, and the M.V. Canadian Explorer, which were two Upper Lakes Group ships. The engine room portion of the M.V. Canadian Explorer, a 730-ft. (222-m) straight deck bulk carrier was joined to the M.V. Hamilton Transfer, a 620-ft. (188.9-m) self-unloading vessel. The cargo hold, wheelhouse, and self-loading system of the Hamilton Transfer were retained, and a new, 24-ft. section was built to join the two ships.

Upper Lakes Group Inc., Toronto, owns and operates one of Canada's largest fleets on the Great Lakes. With the addition of the Canadian Transfer, the number of self-unloading vessels in the Upper Lakes fleet increases to eight, with an additional 13 bulk carriers.

Port Weller Dry Docks is the only Canadian shipyard on the Great Lakes, located above Lock One on the Fourth Welland Canal connecting Lake Ontario and Lake Erie. The yard is, in 1998, completing a \$5 million technology investment. It is equipped to build or convert vessels while retaining the capability of the full-service repair facility. Its dry docks are unique because they flood and empty by gravity rather than



by the traditional method of pumping water. The yard itself consists of two parts, a deep dock for maximum-size Seaway vessels with a water depth of 26 ft. and a shelf with a water depth of 14 ft.

BUYERS DIRECTORY

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ABB Flakt Marine, Box 1043, S-436 21 ASKIM SWEDEN
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Carrier Transcokd, P.O. B. 4805, Syracuse, NY 132211
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Stork Canada, 47 boul. Marie Victorin, Candiac, Quebec, Canada, 181 186

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WA 98257
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Crandall Dry Dock Engineers Inc., P.O. B. 505804, MA 02150
G.J. Wortelboer Jr. BV, P.O.B. 5003, 3008 AA Rotterdam, Neth
Marit Chain, 230 Avenue Desandrouins, 59300 Valenciennes
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Willem Pot, P.O.B. 29102, 3001 GC Rotterdam

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Ballast Technologies .,4620 S. Coach Dr., 85714 , Tucson, AZ Redland Genstar Inc., Executive Plaza IV, Hunt Valley, MD 10912-1031

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Simplex-Turmar Inc., P.O. B. 168, Little Neck, NY 11363-0168

Hamburg 1, GEDRIVE...
Simplex Turmar Inc., P.O. B. 168, Little Nect., ...
U.S.A. Reps:
Railko Ltd., Loudwater, High Wycombe, Bucks
Hamshire ENGLAND HP109QV
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orion Corp., 1111 Cedar Creek Rd., Gratton, WI 53024
Duramax Marine, 16025 Johnson St., Middlefield, OH 44062
Thotdon Bearings Inc., 3225 Mainway, Burlington, Ont.,
CANADA L7M 1A6
Vesco Plastics, P.O. B. 40647, Cleveland 2022 SOUTH
AFRICA

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, Exhaust & Filtration Sys., Hwy. 51 West, P.O.

Box 428, Stoughton, WI 53589

BLOCKS A RIGGING
Skookum, P.O. Box 280, Hubbard, OR 97032

Skookum, P.O. Box 200, 1998

BOAT RENTAL
Edison Chouest, P.O. Box 309, Galliand, LA 70354

BOILERS

B & D Marine & Boilers Inc., P.O. Box 71687, Charleston,

SC 29415

BOILER MANAGEMENT

Technical Marine Services, 6040 North Cutter Circle, Portland, OR

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Captain Astad Company, Inc., P.O. Box 350486, Ft Lauderdale, FL 33335
Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422

vbray's Tug & Barge Sales Corp., 35 De Hart St.,

Morristown NJ 07960

BULKHEAD SEALS/PANELS

CSD North America, 250 Commercial St., Unit 2006A,
Manchester, NH 03101

Blohm & Voss Industrie GmbH, P.O. B. 100720, D-2000

Hamburg 1, GERMANY
Panel Specialists, Inc/Thermax, 3115 Range Rd., Temple,
TX 76501

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Railko Ltd., U.S.A. Reps: Simplex-Turmar Inc., P.O.B. 675, Tonawanda, NY 14151-6675
Rox Corp., 12402 E. 80th St., Tulsa, OK 74146-6922
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CSD North America, 250 Commercial St., Unit 2006A, Manchester, NH 03101
O-Z Gedney * Nelson Firestop, P.O. B. 726, Tulsa, OK 74101-0726
Rox Corp., 12402 F. 60th St., Tulsa, OK 74101-0726

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Albacore Research, 4196 Kashtan Place, Victora, B.C. Canada

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Kockums Computer Systems AB, PO Box 50555, S-202 15
Malmo SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F,
Escondido, CA 92029
TIMSCO, P.O. B. 91360, Mobile, AL 36691
Ship Motion Associates, 10 Danforth St., Portland, ME 04101-4567
IMGO MONITORING A CONTROL SYSTEM
Ian-Conrad Bergan, Inc., 3409 Gulf Breeze Parkway,
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Det Norske Veritas, 70 Grand Ave., Riveredge, N.J. 07661

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Haley Clutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702

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ATIMOS / CORROSION CONTROL / PAINT Eureka Chemical Co., 234 Lawrence Ave., South San Francisco, CA 94080 Corroseal, Inc., 8114 304th Ave., SE, Preston, WA 98050 Hempel, 6901 Cavalrade St., Houston, TX 77028 Products Research Service, 9229 Hwy 23, Belle Chasse, LA 2002. Flexible Decking, 2708 N. Austrialia Ave. Ste. 9, West Palm Beach,

Hexible Decking, 2708 N. Austrialia Ave. Ste. 9, West Palm Beach, FL 33407

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Sigma Coatings, P.O. Box 816, Houston, TX 77029, 330
Harvey, LA 70059,
Atlantic Systems Supply Co.,1100 Adams St., Hoboken, NJ 07030
TNO Institute of Industrial Technology, P.O.B. 3, 2600 AA
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Delft, Netherlands Unitor Ship Services Inc., 2375 West Esther Street, Long

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CRUZAN Diver's Inc., 300 Strand St., Frederiksted Steroix, Virgin Islands 00840

COMMUNICATION AUTOMATION
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Hose McCann, 1241 W. Newport Gender, Deerfield Beach, FL 33442 Hose McCann, 1241 W. Newport Gender, Decirion FL 33442 ICG Satellite Services, 8400 NW 52nd St., Suite 110,

mmunications Networks, Inc., 8400 NW 52nd St, Suite 110, Miami, FL 33166
Ascom Tateco AB, Eppendorfer Weg 234, D-20251 Hamburg,

AT & T Maritime Services, 412 Mt. Kemble Ave 5170, Morristown.

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Autoship Systems Corp., #403, 611 Alexander St., Vancouver, BC, CANADA V6A1E
Chand Corporation, 157 Hwy 654, Mathews, LA 70375
Coastal Oceanographics, Inc., 11-G Old Indian Trail,
Middlefield, CT 06455
Creative Systems, Inc., P.O. Box 1910, Port Townsend, WA 98368

98388
Sener, C/Severo Ochoa, 4 Parque Technologico de Madrid, 28760 Tres Cantos - Madrid SPAIN Intecolor Corp., 2150 Boggs Rd., Deluth GA 30096 Proteus Engineering, 301 Pier One Rd., Stevensville, MD 21666

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

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CONTROL SYSTEM - Monitoring/Steering
Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123

GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1
Houston, TX 77043-1412
Ian-Conrad Bergan, 3409 Gulf Breeze Pkwy, Gulf Breeze, FL

32561

32561 Gems Sensors Division, One Cowles Rd., Plainville CT 06062 MMC International, 60 Inip Dr., Inwood NY 11096 Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006 Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029 Kobelt Mig Co., Ltd., 8238-129 St, Surrey, B.C. V3W0A6 Stork-Kwant BV, P.O.B. 23, 8600 AA Sneek, Netherlands Electronic Marine Systems, 800 Femdale Pl., Rahway, N.J. 07065 AutoNav Marine Systems Inc., 55A Clipper St., Coquitlam, B.C., Canada V3K 6X2 Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

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CANADA V7P 2R2

rs, 2112 SE 8th Ave., Porland, OR 97214

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. If you are interested in having your company listed in this Buyers Directory Section, contact Angela Criscola at (212) 477-6700.

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Bisso Marine To. P.O. Box 805, Icolair Shores, MI 48080-0086
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
McElroy Machine & Mig Co., Inc., P.O. Box 4454, Biloxi MS
39535-4454
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Criesca, MA 02/30 Liebher-Werk Nenzing GMBH, A-6710 Nenzig/Austria, Tschalenga 3, P.O. Box 10 Xtek, Inc., 11451 Reading Road, Cincinnati, OH 45241 CRANKSHAFT DEFLECTION ANALYZER

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Lake Shore Inc., P.O. Box 809, Iron Mountain, MI 49801, 1150
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA
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Pusnes, PO Box 102, N-4818, Faervik, NORWAY
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Beach, CA 92647

Matrix Department

Matrix Desalination, 3295 S.W. 11th Ave., Fort Lauderdale, FL

33315
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Canada

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Alaska Diesel,4420 14th Ave.,NW,Seattle,WA 98107
Brigantine Services Ltd, 48 Wang Lok St., Yuen Long
Hermont Marine Inc., 3528 Griffith, St. Laurent, Quebec Canada
Industrial Estate, New Territories, HONG KONG
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL
61552-0610
Castoldi S.p.A., Viale Mazzini, 161, 20081, Abbiategrasso,
ITALY

nins Engine Co., 4500 Leeds Ave., Ste. 301, Charleston, 9405-8521

ns Mid-South, Inc., 110 E. Airline Highway, Kenner, LA

John Deere, John Deere Rd., Moline, IL 61265 Deutz Canada Inc., 4420 Garand St., Montreal, Que. H4R 2A3 DMI Norshipco Co., P.O. Box 2100, Norblik, VA 23501.2100 GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1, Houston TX 77043-1412

Klattenberg Marine, 17 Grandview Ave., W. Orange, NJ 07052 MAN B&W Diesel AG, Stadtbachstrasse 1, D-86153 Augsburg

1, GERMANY
Air Marine Systems, 2701 Sonic Dr., Virginia Beach, VA 23456
MAN B&W Diesel A/S, Tegiholmsgade 41, DK-2450
Copenhagen SV, DENMARK
MAN B&W Diesel, 17 State St., New York, NY 10004
Motor-Service AB, Box 2115, S-144 04 Ronninge, SWEDEN
Motor Service-Huge Stamp, 3199 S.W. 4th Ave., Pt.
Lauderdale, FL 33315
Fluid Mechanics Inc., 4521 W, 160th St., Cleveland OH 44135-2827

Paxman Diesels, P.O. Box 8, Paxman Works, Colchester

Paxman Dieseis, PO. Box 8, Paxman Works, Ocicnesier, Essex, CO1 2HW,ENGLAND Ulstein Bergen AS, PO Box 924, N5002 Bergen, NORWAY Wartsila Diesel, 201 Delense Highway, Annapolis, MD 21401 Goltens, 160 Van Brunt St., Brooklyn, NY 11231 CMB Cummins Engine Co., 500 Jackson St., Comunbus, IN 47002

DIESEL ENGINE REPLACEMENT

FM / Alco 701 Lawton Ave, Beloit, WI 53511
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
DIESEL ENGINE TEST & SERVICE EQUIPMENT
GEOR DIVERSE OF THE SERVICE FOR S

Kiene Diesel, 325 South Fairbanks, Addison, IL 60101 **DIESEL FUEL DECONTAMINATION** Fuel Dynamics, 707 Mullet Dr. #110, Cape Canaveral, Fl. 32920 **DIESEL GENERATOR SETS** Inc., 4420 Garand St., Montreal, Que. H4R 2A3

DIGITAL SINGLE HANDED RADIO Sea, Inc., 7030 220th S.W. Mt. Lake Terrace, WA 98
DIGITAL TORQUE METER SYSTEM
Instruments Computers & Controls, 70 South Bow Rd., ace. WA 98043

Hookset, N.H. 03106
DIVING A SALVAGE

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IVIHQ A SALVAGE

Coast Diving Services, Inc. 793 B Mira Flores, San Pedro CA 90733

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178

H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183

JW Fishers, 65 Anthony St., Berkley, MA 02779

South Texas Underwater Divers, 2921 16th Ave. North, Texas City, Texas 77590

Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOCK FENDERING SYSTEMS

Plastic Pilings Inc., 1485 South Willow Ave., Rialto, CA 92376

Poly Hi Solidur, 2710 American Way. Fort Wayne IN, 46899

DOORS - MARINE A INDUSTRIAL

Branton Ind., 1101 Edwards Ave., Jefferson, LA 70181

Mapeco, Inc., 90 Forest Ave., Locust Valley, NY 11560

Marine Accomodations, 3830 Willaimsburg Park, Suite 7

Jacksonville FL 32257

Railway Specialties Corp., 2979 State Rd., P.O. Box 29,

Railway Specialties Corp., 2979 State Rd., P.O. Box 29, Bristol, PA 19007

DRY DOCKS-Design
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan
City, LA 70381 ndall Dry Dock Engineers Inc., P.O. Box 505804, Chelsea,

MA 02150

Heger Dry Dock Engineers, Inc., P.O.B. 6605, Holliston, MA 01746
Poly Hi Solidur, 2710 American Way, Fort Wayne, IN 46899

EDUCTORS

Vita Molivator, 566 Parker St., Newark, NJ 07104

ELECTRICAL EQUIPMENT

Baylor Co., 500 Industrial Blvd., Sugarland, TX 77478

L.F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150

70150
MMC International, 60 Inip Dr. Inwood NY 11096
Air Marine Systems, 2701 Sonic Dr., Virginia Beach, VA 23456
Semco Marine Inc., 3721 SW 47th Ave., Ste 309, Ft.
Lauderdale, Ft. 33314

ELECTRICAL MOTOR DRIVES

ch Power Controls, 10850 S. Wilcrest, Houston, TX

77099

ELECTRONIC INFORMATION SUPPORT
Scandinavian Micro Systems, P.O. Box 155, N-1411,
Kolboton, NORWAY

ELEVATORS

Alimak Elevator Co., 1100 Boston Ave., Bridgeport, CT. 06610
McElroy Machine, 1101 Lorraine Rd., Biloxi, MI 39535-4454

EMPLOYMENT

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

ENGINEERING SERVICES / MARINE ENGS Kvaerner Masa Marine Inc., 201 Defense Highway, Sui Annapolis, MD 21401 NKF Engineering, Inc., 4200 Wilson Blvd., Arlington, VA

22203
Elliot Bay Design Group 5301 Shillshole Ave. N.W. Ste. 200, Seattle, WA 98107 Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

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

ENGINE LUBRICATION SYSTEMS
Engine Lubrication Systems, 64 State Rd., Paoli, PA 19301

ENGINE ROOM LIGHTING/MONITORING A

CONTROL SYSTEMS
Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
Radio-Holland USA, 8943 Gull Freeway, Houston, TX 77017

EPIRAS

Alfa-Laval Separation, Inc., 955 Mearns Rd., Warminster, PA Beaird Industries Inc., P.O. Box 31115, Shreveport, LA 71130 EXPANSION JOINTS

Silex Inc., 7850 Tranmere Dr., Mississauga, Ontario L5S1L9
Applegate Industrial, 1440 Government Street, Baton Rouge,
| A 70802 EXPLOSIVELY BONDED METALS

Northwest Technical Industries, 2249 Diamond Point Rd.,

iwest Technici im. WA 98382 Sequim, WA 98382
FAIRING COMPOUND
Philadelphia Resins, P.O.B. 309, Montgomeryville, PA

FANS - VENTILATORS - BLOWERS
Dry Air Technologies 313 N. Oak St, Burlington, Wa 98233
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA
94402

Jamestown Distributors, P.O. Box 348, Jamestown, RI 02835
Superbott, P.O.B. 683, Carnegie, PA 15106
FENDERING SYSTEMS/BUOYS - Dock & Vessel
Plastic Pilings Inc., 1485 South Willow Ave., Rialto, CA 92376
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Seaward International, Inc., Clearbrook Industrial Park, P.O.
Box 98, Clearbrook, VA 22624
Urethane Products, 17007 South Broadway, Garden, CA butors, P.O. Box 348, Jamestown, RI 02835

Urethane Products, 17007 South Broadway, Garden, CA 90248
Viking Fender Co., 1160 State St., Perth Amboy, NJ 08861
Ultra Poly, Inc., 2926 South Steele St., Tacoma, WA 98409
Promar, 115 Industrial Blvd., Kearneysville, W. VA 25430
Schuyler Rubber Co., 16901 Woodred Rd., Woodinville, WA 98072

Wellington, P.O.B. 244, Madison, GA 30650

FILTER CRUSHERS

Tech Oil Products Inc., 4308 W. Admiral Doyle Dr., New Iberia, LA 70550

FILTERS
Boll Filter, 15 International Dr., East Granby, Ct. 06206
Kraissi Co., 299 Williams Avenue, Hackensack, NJ 07061
FILTER SYSTEMS

ner, Inc., 5050 Quorum Drive, Dallas, TX 75240

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FIN STABILIZERS
Blohm & Voss Industrie GmbH, P.O. Box 10 07 20, D-2000
Hamburg 1, GERMANY;
Railko Ltd. : U.S.A. Reps: Simplex-Turmar Inc., P.O.B. 675,
Tonawanda, NY 14151-0675

FIRE FIGHTING COURSES

rd Fire Service Ltd., 561 Wain Rd., Sidney B.C.

Canada V8L 5N8
FIRE FIGHTING EQUIPMENT

SCO, 2040 Harbor Island Dr., Suite 201A, San Diego, CA. 92101

Nautical Safety Products, P.O. Box 590462, Houston, TX 77259
FIRE PROTECTION
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807 Safety Products, P.O. Box 590462, Houston, TX 77259

70807 Unitor Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813 Grinnell Fire Protection, 835 Sharon Drive, Westlake, OH 41145 American Pacific Corp., 3770 Howard Hughes Pkwy, Las

Vegas, NV 89100

FIRE RESISTANT PANELS

Panel Specialists, Inc/Thermax, 3115 Range Rd., Temple,

FLAME RETARDANT TEMPORARY COVERING

Bainbridge, 252 Revere St., Canton, Mass. UZU1
FILIED GUAGES
King Engineering, Po. Box 1228, Ann Arbor, MI 48106-1228
FLUID HANDLING EQUIPMENT
Graco, Inc., P.O. Box 1441, Minneapolis, MN 55441

FUEL CONSERVATION er & Controls, Inc., 70 South Bow Rd.

Hookset, NH 03106

FUEL DECONTAMINATION

Fuel Dynamics, 707 Mullet Dr. #110, Cape Canaveral, Fl. 32920

Environmental Solutions Intl, 11002 Raccoon Ridge, Reston, VA

20191-4911

CALLEY EQUIPMENT
Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second
Ave, Boca Raton, Fl. 33431
Lang Manufacturing, PO. B. 905, Redmond, WA 98073
Marine Accomodations, 3830 Williamsburg Rd.,
Jacksonville, Fl. 32256

GANGWAYS, LADDERS

SlipNot Safety Flooring, 2545 Beautait St., Detroit, MI 48207 Wooster Products Inc., 1000 Spruce St., P.O. Box 896, oster, OH 44691

GEAR REPAIR

Haley Marine Gears International, Inc., 2600 N. Concord Belle Chasse, LA 70037 Nico Marine Specialties, 39 Louisiane St., West Wago, LA 70094 Cincinnati Gear Company, 5657 Wooster Pike, Cincinnati, OH

Alaska Diesel, 4420 14th Ave., NW, Seattle. WA 98107 Baylor Co., 500 Industrial Blvd.. Sugarland, TX 77478

Newport News, Va. 32606 Furuno USA, Inc., 271 Harbor Way, S. San Francisco, CA

Padio-Holland USA, 8943 Gulf Freeway. Houston, TX 77017 Sea, Inc., 7030 220th S.W. Mt. Lake Terrace, WA 98043 HEAT EXCHANGERS

n Inc., 955 Meams Rd., Warminster, PA 18974 Beaird Industries Inc., P.O. Box 31115, Shreveport, LA 71130 Dearld Industrial History 1.00 Box 31113, Gareepolit, DX 71130 Computable - A Division, of Britannia Heat Transfer, Ltd., 15-20 Coleshill Industrial Estate, Station Road, Coleshill, Birmingham B46 IJP UK

Crane Heatex, 17 Grandview Ave., West Orange, NJ 07052 HIGH TEMPERATURE ELASTOMER

Greene, Tweed & Co., 2075 Detwiler Rd., Kulpsville, PA 19443-0305

PA 19443-0305

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

HORMS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner,

HOSE & FITTINGS

ch Co., Chesapeak Bay Business Park, 100 Log Canoe vensville MD 21666

HYDRAULICS

Marine Hydraulics Co., 201 Harrison St., Cunningham Marine Hoboken, NJ 07030

Hoboken, NJ 07030
Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123
Hamilton Jet, P.O. Box 709, Christchurch, NEW ZEALAND
Offshore Inland, Inc. 3521 Brookdale Drive. Mobile, AL 36618
Ultra Hydraulics Limited, Cheltenham Road East, Gioucester,
GL2 9CN, ENGLAND
Demaree Infatables Boats, 410 Oak St., Friendsville, MD 21531
Ocean Technical Services Inc., 1140 Peters Rd., Harvey, LA
70058-1705

70058-1705

HYDRAULIC SYSTEM FLUSHING

Consolidated Fluid Power, 155 Wright Ave., Dartmouth, N.S.

HYDRAULIC TRAINING
Consolidated Fluid Power, 155 Wright Ave., Dartmouth, N.S.

Canada B4C 3M1

INFLATABLES

ical Services Inc., 1140 Peters Rd., Harvey, LA

INMARSAT-C

030 220th S.W. Mt. Lake Terrace, WA 98043

Sea, Inc., 703 Blohm & Voss Light Insulation. Bartels & Laders GmbH, Norderelbstrasse 15, 20457 Hamburg GERMANY Panel Specialists, Inc/Thermax. 3115 Range Rd., Temple,

IA 70001 Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123 Mascoat Products, 3500 E. T.C. Jester, Suite N, Houston, TX 77018

es TX 77619

Pacor, Inc., P.O. Box 107, Westville, NJ 08093x Superior Energies Inc., P.O. Drawer 386, Groves T INTEGRATED MONITORING SYSTEMS Datastar, Unit 100, 18 Gostick Place, N. Vancou

INTERIORS

Custom Ship Interiors, Inc., P.O. Box 882, Solomons, MD 20688
Hopeman Brothers, P.O. Box 820, 435 Essex Ave.,
Waynesboro, VA 22980
Insulations, Inc., Rt. 5, 12360 Leisure Rd. Baton Rouge. LA
70807

7 stown Metal Marine Sales, Inc., 4710 NW Second 3oca Raton, FL 33431 e Accomodations, 3830 Williamsburg Rd., sonville, FL 32256 me Services Corp., 3457 Guignard Drive. Hood River. OR 97031

Directions In Design, 1848 Craig Rd., St., Louis, MO 63146 James P. Colie & Associates, 2116 Sherman St., Hollywood,

JET BOWTHRUSTERS
Thrustmaster of Texas, P.O. Box 840189, Houston, TX 77084-0189
JOINER—Watertight Door—Paneling—Celling System—Decking All Alpha Inft., Inc. P.O. Box 498985, Cincinnat, OH 45249
Branton Ind., 1101 Edwards Ave., Jefferson, LA 70181
CustomShip Interiors, Inc. P.O. Box 882, Solomors MD 20688
Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980 22980

22900 | Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123 | Marine Accomodations, 3830 Williamsburg Park, Suite7 | Jacksonville, FL 32257

Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031 Panel Specialists, Inc./Thermax, 3115 Range Rd., Temple, TX 76501

Walz & Krenzer, Inc., 90 Forest Ave. Locust Valley N.Y.

KEEL COOLERS

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

LASER ALIGNMENT
Boland Industrial & Cardinal Control Control Control Control Control

ulting Services, P.O.B. 91360, Mobile, AL

LIFEBOATS/RAFTS
American Eagle Mtg., Inc., 780 Pearle Jensen Way, LaConner

Avon Marine, 11215 Young River Ave., Fountain Valley, CA 92708 DBC Marine Safety Systems, 12351 Bridgeport Rd., Richmond, B.C. CANADA V6V1J4

B.C. CANADA V6V1J4 Norsafe AS, P.O. Box 115, N-4818 Faervik, Norway Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA

92806 Zodiac of North America, P.O. Box 400, Stevensville, MD

21666
LIFESAVING EQUIPMENT
MGI International, 119-225 West 1st St., North Vancouver,
B.C. CANADA

Steams Manufacturing, P.O. Box 1498, St. Cloud, MN 56302

LIGHTING SYSTEMS / EQUIPMENT—Lamps.Fixtures,
Searchlights

ACR Electronics, Inc., 5757 Ravenswood Rd., Ft. Lauderdale,

FI 33310-5247 PL 33310-5247 Archway Marine, 4501 Swan Ave., St. Louis, MO 63110 Golten Marine, 160 Van Brunt St., Brooklyn, NY 11231 Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner,

Pauluhn Electric Mfg. Co., Inc. P.O. Box 53, Pearland, TX 77588
Francis Searchlights/Stam Supply Co., 4415 6th N.W.,

Seattle, WA 98107
LINE & NET CUTTER SYSTEMS

Spurs Marine. 201 S.W. 337d Street, Ft. Lauderdale, Ft. 33315
LIQUID LEVEL QAUGES
King Engineering Corp., P.O. Box 1228, Ann Arbor, MI 48106
LIQUID OVERFILL PROTECTION SYSTEMS
E.R.L. Marine Products, P.O.Box 1026, New Albany. IN
47151-1026
Gens Connection (Connection Connection Connection Connection Connection Connection Connection Connection Con ors, Inc., 1 Cowels Rd., Plainville, CT, 06062

Gems Sensors, Inc., . LOQISTICS
VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING

ERHAUL, AND TESTING
Lake Shore Inc., P.O. Box 809, Iron Mountain, MI 49801, 1150
Gotten Marine Co. Inc., 160 Van Brunt St., Brooklyn, NY 11231
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C.

2/604-1851
Maritime Power 200 Henderson St., Jersey City, NJ 07302
MANAGEMENT SYSTEMS & SERVICE ower Marine, Pier 3 Ferrboat Santa Rosa, San Francisco, CA

94111
PCS Marine, 174 Colonnade Road S., Nepean, Ontario K2E715
MARINE BUILDING SUPPLIES
King Wholesale Supply, Co., Inc., P.O Box 4002, New Orleans,

MARINE CEILINGS
Hydro-Alumunium, Vik V

Hydro-Alumunium, Vik Verk. N-5880 VIK I SOGN, Norway Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA

Panel Specialists, Inc., 3115 Rar MARINE CONSULTANTS ., 3115 Range Rd., Temple, TX 76501

PCS Marine, 174 Colonnade Road S., Nepean, Ontario K2E715 Resolution Management, 11 Eves Drive Suite 140, Mariton, NJ

Homblower Marine, Pier 3 Ferryboat Santa Rosa, San Francisco, CA 94111 OA 94111 Boland Industrial & Consulting Services, P.O.B. 91360, Mobile, AL 36691

Step 1
Kvaerner Masa Marine, 201 Defense Hwy., Annopolis, MD 21401
MARINE DECKING
E.H. O'Neill Co., 1405 Chippendale Rd., Lutherville, MD 21093

21093
Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA
22980
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA

70807 Flexible Decking, 2708 N. Austrialia Ave. Ste. 9, West Palm Beach, FL 33407

SlipNot Safety Flooring, 2545 Beaufait St., Detroit, MI 48207

MARINE DRILLING & BLASTING

Drilling & Blasting, Inc., P.O. Box 18098, Hills, CA 90209-4098

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MARINE ELECTRONICS
Frank L. Beier Radio. 2001 Ridgelake Dr., Metairie, LA 70001
Autronica USA, 234 Industrial Pkwy, Northwale, NJ 07647
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner.
LA 70068
Saah Marine Electronica AP, Box 10045, 100 57 C LA 70068
Saab Marine Electronics AB. Box 13045, 402 51 Goteborg, SWEDEN

d Marine Technology, 2003 Western Ave., Suite 725, Seattle WA 98121

an Micro Systems, P.O. Box 155, N-1411. Kolboton, NORWAY

Interstate Electronics, 1001 E. Ball Rd., Anaheim, CA 92803 Scientific Marine Services, Inc., 101 State Pl., Suite F,

MARINE EQUIPMENT

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Lake Shore Inc., P.O. Box 809, Iron Mountain, MI 49801, 1150
Plastic Pilings Inc., 1485 South Willow Ave., Rialto, CA 92376
Waterman Supply, P.O. Box 596, Wilmington, CA 90748
Martime Power Corp., 200 Henderson Str., Jersey City, NJ C7302
Northeast Tech, P.O. Box 38189, Olmstead Falls, Ohio, 44138
Bohnet & Associates, 1150 Rule Rochelle, Sidell, VA 70458
Scardana Americas Bkg., 502 Empire St., Montreal,
Greenfield Park, J4Y1V7, Canada
MacGregor, 20 Chapin Road, Unit 1012, NJ 07058

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MacGregor, 20 Chapin Road, Unit 1012, NJ 07058 Machine, P.O. Box 4454, Bijoxi, MS 39535-4454

MARINE FINANCING
Debis Financial Services, 201 Merrit 7, Suite 70, Norwalk, CT 06856
Bank Corp., 3 Riverway Ste, 1900 Houston, TX 77056
Sateco Credit Co. Inc. 4909 156th Ave. NE, Redmond, WA

98052
MARINE GEARS
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492
Marine Gears, P.O. Box 689, Greenville, MI 38702
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati,

MARINE INSULATION
Mascoat Products, 3500 E. T.C. Jester, Suite N, Houston, TX MARINE PAINTINGS

6 Ridge Drive, Old Saybrook, Ct 06475 Sarba Art Studio, 6 Ridge Drive, Old Saybrook, MARINE PUMPS
Scardana Americas Bkg., 502 Empire St., Montreal, Greenfield Park, J4V1V7, Canada Gilkes Inc., P.O. Box 628, Seabrook, TX 77586 MARINE SEATING

Stidd Systems Inc., P.O. Box 87, 220 Carpenter Drive, Greenport, NY 11944

MARINE SHAFTING

Western Branch Metals, Inc., 2401 Wesley St., Portsmouth, VA 23707

Kahlenbarg Peop B.O. C.

VA 23707
Kahlenberg Bros. P.O. Box 358, Two Rivers, WI 54241
MARINE SURPLUS SALES
Defense Reutilization & Marketing Service, 2163 Airways
Blvd., Memphis, TN 38114
MARINE SYSTEMS SIMULATION
Applied High Technology, 4 Place Dee Commerc
Brossard, Suite 201 Quebec Canada J4W-3B3
MECHANICAL PUMP SEALS

MECHANICAL PUMP SEALS , USA, 1536 Barclay Blvd, Bufallo Grove,

METERS JSA, 2508 Lakebrook Ct., Atlanta, GA 30360 Selco USA, MONITORS

Intercolor Corp., 2150 Boggs Rd., Deluth GA 30096
MONITORING SYSTEMS

Datastar Marine Products Inc., Unit 100 18 Gostick PI., NVancouver, Canada V7M3G3 MOORING LINES Philipstan Inc. 45 Co.

Inc., 151 Commerce Drive, Montgomeryville, PA MOTOR PROTECTION EQUIPMENT
Marine Safe Electronics, 37 Staffern Dr., Concord, Ontario

NAUTICAL JEWELRY
Nautical Gold Creations,

ns, 23731 Madison St., Torrance, CA ARCHITECTS, MARINE ENGINEERS,

Band, Lavis, & Associates, 900 Ritchie Hwy, Suite 203, Sevema Park, MD 21146

an, MU 21146 Northeast Technical, P.O. Box 38189, Olmstead Falls, Ohio, 44138

44138 Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Aflington, VA 22202 Bay Engineering, 253 N. First Ave., Sturgeon Bay, WI 54235 Donald L. Blount, 2550 Elismere Ave., Ste. K, Norfolk, VA 23513 C. Baxter & Acceptage 1

23513
C. Baxter & Associates, P.O. Box 9006, Mobile, AL 36609
CDI Marine Co., 4040 Woodcock Dr., Suite 200, Jacksonvil FL 32207
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., P.O. Box 505804, Chelsea, MA 02150

MA 02150 MA 02150
Crane Consultants. 15301 First Ave S., Seattle WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
CT Marine, 56 Crooked Trail, Rowayton, CT 06853
Cunningham & Walker, 1762 Providence Hollow Lane, ville, FL 32223

Arthur D. Darden, 3200 Ridgelake Dr., Suite 403, Metairie LA DeJong & Lebet, Inc., 1734 Ernerson Street, Jacksonville, FL

32207
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, 2120 Washington Bivd. Ste.200, Arlington, VA 22204
Elliot Bay Design Group 5301 Shilshole Ave. N.W. Ste. 200, Seattle, WA 98107

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GHM Inc. (Ind. Measurement Consultants), P.O. Box 1836, Newport News, VA 23601

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Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010
Heger Dry Dock Engineers, Inc., P.O.B. 6605, Holliston, MA 0174
John W. Gilbert & Assoc., Inc., 199 State St., Boston, MA 02109
The Glosten Assoc. Inc., 600 Mutual Life Bldg., 605 First
Ave., Seattle. WA 98104
Guido Perla & Assoc., 720 3rd Ave., Ste. 1200, Seattle, WA
98104

98104 Morris Guralnick Associates, Inc., 130 Sutter St., Ste. 400, SanFrancisco, CA 94104 C. Raymond Hunt Associates, 69 Long Wharf, Beston MA 02110 JJH Inc. 3412 Page 201

u≥110 JJH Inc., 3412 Progress Dr., Bensalem, PA 19020 R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073 Kvaemer Masa Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401

n, 799 Brickelli Plaza Ste. 701, Miami, FL

Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225 MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 02505

Aian C. McClure Associates, Inc., 2600 South Gessner,

Aian C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063 McErroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454 John J. McMullen Associates, Inc., 1 World Trade Ctr. Ste 3000.NY.NY 10048 2341 Jefferson Davis Hwy, Arlington, VA 22202 Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401 Marine Design & Operations, Inc., 225 E. 1st Ave., Roselle, NJ 07203 Marine Power Associates 1010 Turquois St. Ste 217, San Marine Power Associates 1010 Turquois St. Ste 217, San wer Associates, 1010 Turquois St., Ste 217, San

Maritier Power Associates, 1010 turquois St., Ste 217, St Diego, CA 92109 Maritech, Seacliff, Bay Road, Newmarket. NH 03857 Mantime Design, Inc., 3020 Hartley Rd., Jacksonville, FL

32257

R.J. Wellusi & Co.. 71 Hudson St, New York, NY 10013

Nautical Designs, Inc. 2101 S. Andrews Ave, Suite 202, Ft

Lauderdale FL 33316 ine Surveyors Co., P.O. Box 283, Port Jefferson,

Naurus Sandar FL 33310 Olsen Marine Surveyors Co., P.O. Box 200, 100 NY 11777 M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY t & Herkes, 225 Baronne St., Suite 1405, New Orleans Scientific Marine Services, Inc., 101 State Pl., Suite F.

Escondido, CA 92029
Sea School, 10812 Gandy Blvd, St. Petersburg, FL 33702
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Seaworthy Systems Inc., P.O. Box 995, Essex, CT 06426; 1
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544
George G. Sharp, Inc., 100 Church St., New York, NY 1000
R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
MSCL Inc., 1452 Duke Street, Alexandria, VA 22304
AK. Suda & Ass., 3004 19th St., Metairie, LA 70002-4989
TIMSCO, P. O. Box 91360, Mobile AL 36691
VIOATION & COMMUNICATIONS EQUIP-INT

IT sarco Intl., 2558 Mountain Industrial Blvd., Tucker, GA 300 Northern Airborn Tech., 28 Lord Road, Suite 130, Mariborough. Northern Air MA 01752

MA 01752
Electronic Marine Systems, 800 Ferndale PI., Rahway, N.J. 0706
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ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford,
Arundel, West Susex, UK
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C.
Negron Marine Consultants, 840 Bond Street, Elizabeth, NJ

07201
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
Scandinavian Micro Systems P.O. Box 155, N-1411,
Kolboton, NORWAY
Sea, Inc., 7030 220th S.W., Mountlake Terrace, WA 98043
Simrad, 19210 33rd Avenue West, Lynwood, WA 98036
Simrad Robertson, 10801 Hammeriy, Suite 100, Houston, TX 77043-1923
Standard Communications, P.O. Box 92151, Los Angeles

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Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waterway Communications System, Inc. 453 E. Park PI, Inforcement In

Sunnyvale, CA 94086 Waterway Communication Jeffersonville, IN 47130 mational, 5013 Pacific Hwy East, Fife, WA

98424 G-Mar Inc., 1801 McGill College, Montreal, Quebec H3A2N4 Land Sea Systems, 849 Seahawik Circle, Suite 103, Virginia Beach, VA 23452

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Magellan Systems Corp., 960 Overland Crt., San Dimas, CA 91773-1742 KVH Industries, Inc., 110 Enterprise Center, Middleton, R.I.

02842-5268
NOZZLE SYSTEM
Custom Nozzle Fabrication, P.O. Box 547, Pascagoulo, MS

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18974-0556
Blohmå Voss U.S.A. Reps:Simplex-Turmar Inc., P.O. Box
168, Little Neck, NY 11363-0168
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
MMC International, 60 Inip Dr, Inwood NY 11096
Westfalia Separators, 100 Fairway Ct., Northvale N.J. 07647
Nelson Industries, Highway 51 West, Stoughton, WI 53589
RGF Environmental Group, 3875 Fiscal Court, W.Palm Beach,

7030 220th S.W. Mt. Lake Terrace, WA 98043

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Holly, MI 48442
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Victaulic Co., 4901 Kesslersville Rd., Easton, PA 18042
PIPE JOINING PRODUCTS
Victaulic Co., 4901 Kesslersville Rd., Easton, PA 18042
Fetteroff Corp., P.O. Box 103, Skippack, PA 19474
PIPING SYSTEMS
Blucher Josam, 2501 S. Front Street, Philadelphia, PA 19148
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Enecon Corporation, 125 Baylis Rd., Melville, NY 11747-3800
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PRE-LUBER
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Associated Marine Technologies, 4016 Seaboard St.,
Portsmouth, VA 23701 Holland Roer Propellers, 2273 Batataria Blvd, New Orleans

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LA, 70072

S & S Propellers, 26-15 123rd St., Flushing, NY 11354
Rolla SP Propellers SA, P.O. Box 251, Via Silva 5, 6828
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Harvey, LA 70058
American Air Filter, P.O. Box 35690, Louisville, KY 40432
ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201-0372
ABB industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND
ABB TURBOCHARGER, INC.,1460 Livingston Avenue, N.
Brunswick NJ 08902 Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND Brunswick, NJ 08902

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Aquamaster-Rauma Inc., 2315 North Woodlawn Ave., Ste.
103, Metarie, LA 70001
Avtron Manufacturing, 7900 E. Pleasant Valley, Independence,
OH 44131
Brunvoll A/S, P.O. Box 370, N-6401, Molde, Norway
Caterpillar, 100 NF Adams Street, Peoria, IL 61629-2320
Centa Corp., 8185 Cass Ave., Darien, IL 60561
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH

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Stewart & Stevenson, 1400 Destrehan. P.O. Box 8, Harvey LA 70059-0008
Thrustmaster of Texas, P.O. Box 840189-12227 IFM 529, Houston, TX 77284-0189
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NORWAY Ultra Hydraulics Limited, Cheltenham Road East, Glouce GL2 9GN, ENGLAND Voith Hydro Marine Technology, P.O.B. 1125, D89509, Heidenheim, GERMANY

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Marine Propulsion Inc., 1505 Corbin Ave., Hammond, LA 70403
The Cincinnati Gear Company, 5657 Wooster Pike,
Cincinnati, OH 45227
Propulsion Sustance

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Propulsion Systems, 609 N.W. St., Seattle, WA 98107
Renold Hi-Tec, 512 W. Crescentville Rd. Cincinnati, OH 45246
Bird Johnson, 110 Norfolk St., Walpole, Mass., 02081
U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave.,
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Scardana Americas Bkg., 502 Empire St., Greefield Park, J4V1V7
Canada

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American Eagle, 780 E. Pearie Jensen Way, LaConner, WA

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

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Bayer AG, D-41538, Dormagen, GERMANY
Philystran, Inc., 151 Commerce Drive, Montgomeryville, PA
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AlfaTec, Inc., 4027 21st Ave. West, Seatle, WA 98199
Owens Mig., Hwy 92, Youngsville, LA 70592
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Furuno USA, Inc., 271 Harbor Way, S. San Francisco, CA 94080

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UCG Satellite Communications, 8400 NW 52nd St., Suite 110, Miami, FL 33166

Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27604-1851

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Norwegian Telecom, Postboks 6701 St. Olivs Plass, N-0130, Oslo, Norway
PTT Telecom, Station 12, P.O. Box 30150-2500 JD The Hajlue, NETHERLANDS
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
Singapore Telecom, 15 Hill Street, Telephone House, 2nd Storey, Singapore 0617
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IL 60089
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American Bureau of Shipping, 2 World Trade Center, 106th
FI., New York, NY 10048
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Synchrolift Inc., Two Datran Center, 9130 S. Dadeland Blvd.,
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Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City,
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Biohm & Voss, Industrie Gmb H, P.O.B 100720, D-20457, Hamburg GERMANY
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Thordon Bearings, Inc., 3225 Mainway, Burlington, Ontario Canada LTM 1A6
Vesco Plastics, P.O. Box 40647, Cleveland 2000

Africa
STERN TUBE SEALS
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U.S.A. Reps: Simplex-Turmar Inc, P.O. Box 168, Little Neck,
NY 11363-0168
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Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner,
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MMC International, 60 Inip Dr. Inwood NY 11096
Prime Mover Controls, 3600 Gilmore Way, Burnaby V5G 4R8
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Goteborg SWEDEN
Technical Marine Service, 6040 North Cutter Circle, Portland,
OR 97217
Electronic Marine Systems, 800 Femdale PL, Rahway, N.J. 07065

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32561
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Leslie Controls, 12501 Telecom Dr., Tampa, FL 33637
Loeffler Corp., 201 E. Lincoln Hwy., Penndel, PA 19047-4097
MMC International, 60 Inip Dr, Inwood NY 11096
Service Valve & Fitting, P.O. Box 9665, Mobile, AL 36609
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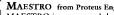


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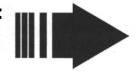
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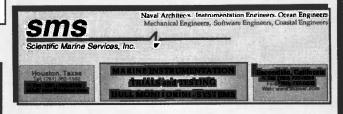
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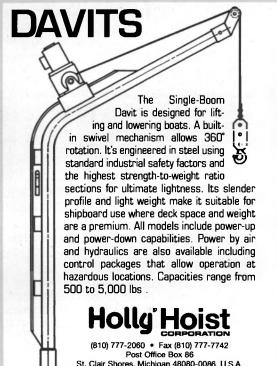
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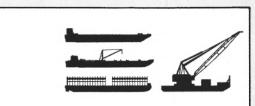
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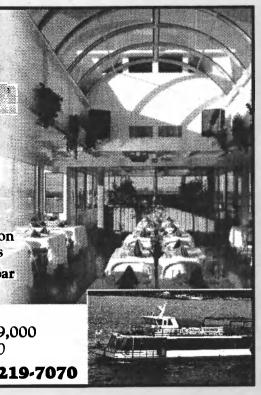
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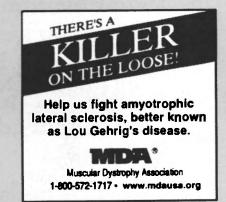
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(Continued from page 82)

ter part of last year and is expected to be completed this month. The work is being carried out by a team of project managers from both Shiprepair and Offshore Divisions within MSE.

The news that there was a recent merger between Sembawang Corporation and ST Industries will not affect the current make-up of the Singapore shiprepair industry. Industries' repair yard in Tuas was not included in the merger, and therefore will remain autonomous from Sembawang Shipvard, which is also being operated autonomously from Jurong Shipyard Ltd. (JSL) despite a merger, carried out last year, between these two companies. There are a total of four VLCCs recently under repair in Singapore's Sembawang Shipyard, and the yard continues its dominance of the cruise vessel repair market with three such projects already completed this year: Norske Cruises' 4,042-grt Sea Goddess 11; White Star Cruises' 2,248-grt Star Flyer; and PT Pelayaran Nasional Indonesia's 14,501-grt Kerinci, which has been at the vard since January undergoing a major refurbishment due to be completed in July.

Hitachi Zosen (Singapore) has now completed the nine-month period FPSO conversion, which is the yard's first, of the 131,484 dwt Rang Dong. The vessel, formerly the Proster, is to be operated by SBM Engineering for a joint venture company Japan Vietnam Petroleum Co. (JVPC), which involves Mitsubishi Diamond off the Vietnam coast, on the Rang Dong oilfield.

Jurong Shipyard Ltd. (JSL) is Singapore's most successful yard in the conversion market, with no less than three major projects currently underway, having recently completed another two. The contracts completed were the Juno project, a 357,600-dwt conventional tanker converted to FPSO for Pemex, now named Ta'Kuntah, and the Modec Venture 1 project, which saw a FSU upgraded to FPSO status for Japan's Modec.

The three conversion projects currently in the yard all involve contracts from Brazil's Petrobras. The P40 storage unit is a former derrick barge, named DB100, owned by McDermott; the P37, formerly Seatankers' 246,051-dwt conventional tanker Friendship, is a floating storage unit (FSU); and the P38, formerly World-Wide Shipping's 261,729 dwt VLCC World Eminence, is a FPSO.

Keppel Shipyard (Tuas) is also involved in the FPSO conversion market with the 140,905 dwt Ruby Princess (ex Knock Davie) FPSO currently being converted for Nortrans, the unit to be operated on the Vang Tau oilfield off the Vietnamese coast for a joint venture between Petronas (Malaysia) and Carigali (Vietnam).

She is due for delivery in the third quarter of this year. Keppel has also currently completed the 135,015 dwt Petroleo Nautipa (ex Knock Buie) FPSO project, also for Nortrans, for use on the Kiame oilfield off Angola for Ranger Oil. The yard also has the FPSO SPU 4 (formerly the Shell Fulmar FPSO), at the yard awaiting an upgrading contract from new owners Care Offshore. Other conversion work includes the Peregrine IV project (hull to drillship) for Houston's Falcon Drilling. From the large tanker market, the yard is currently repairing the 279,986 dwt Panamanian VLCC Sebu, which is the third VLCC contract won by Keppel this year from WorldWide Shipping Agencies. Other ships currently under repair include OMI Corp.'s 155,869 dwt Liberian tanker Cairo Sea and Associated Maritime's 274,376 dwt Liberian ore carrier Weser Ore.

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