January 2004

MARITIME REPORTER AND ENGINEERING NEWS

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Passenger Vessels

Dinner Boats, Ferries Lead the Way

U.S. Navy

Cruiser Modernization Program Adds Power, Extends Life

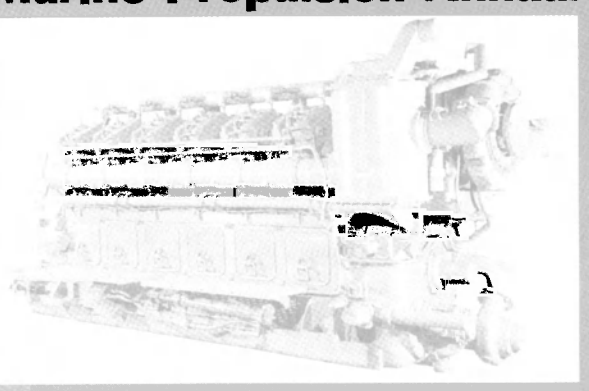
Containerships

...be a Feeder Frenzy?

The Shipbuilding Report

Newbuild Prices, Business are Buzzing

Marine Propulsion Annual



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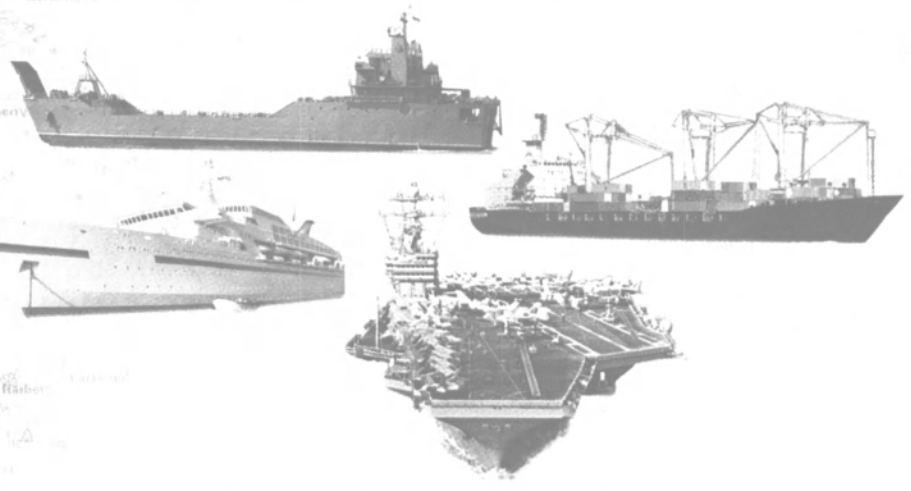

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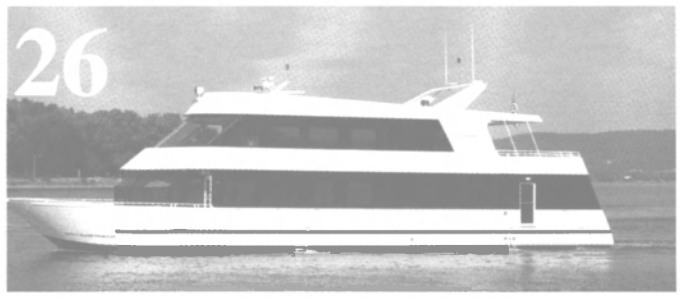

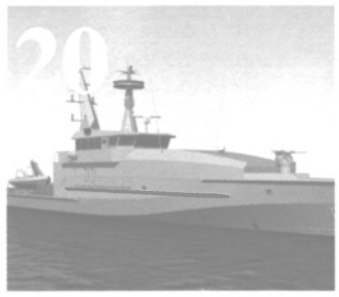

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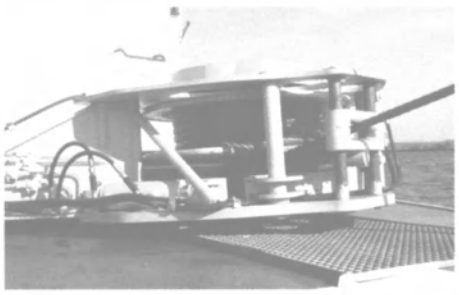
Novatug Launches Carrousel Winch Tug

Novatug completed trials of a winch-based Carrousel system and launched a new Compact Carrousel tug design. The Carrousel system is designed to enable the towing wire to rotate 360 degrees around the tug, improving braking and steering power while reducing costs. The winch-based system introduces further flexibility, allowing tow lines up to 60m in length to be handled with proto-



type, and greater lengths with a larger winch in production models.

"The new tug design and the ability to use the Carrousel system with a towing winch now open up the possibility of substantially reducing operating costs of harbor tugs while enhancing safety and efficiency," said Novatug's commercial manager **Walter Jacquet**. "We have had fantastic results using the winch version of the Carrousel on our test tug, Multratug 12, which has completed over 30 live operations with the winch, and over 300 with the hook version. We are already getting commitments to build the new tug."

Novatug's Compact Carrousel Tug design is a 27 m harbor tug with bollard pull up to 100 tons, equipped with twin nozzled propellers and flapped rudders.

According to Jacquet, conversion of existing tugs to take the Carrousel system is straight forward, and Novatug is offering a larger 35 m 120 ton bollard pull escort tug design in addition to its new compact design. "We have already had a commitment from two major North European tug operators to build one of the escort tugs, and one of the compact vessels," he said.

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The Index

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Editor's Note

It's the first of the year, which means the universe of prognosticators are in full bloom, weaving together new insights, analysis and predictions. Though I depend mightily on the power of numbers to help keep abreast of an ever-changing industry, I am becoming ever more wary of the "statistic." Perhaps more accurately, I am particularly skeptical of the proliferation of too many sources for official statistics, as a seeming flood of data and information serves to cloud rather than clarify.

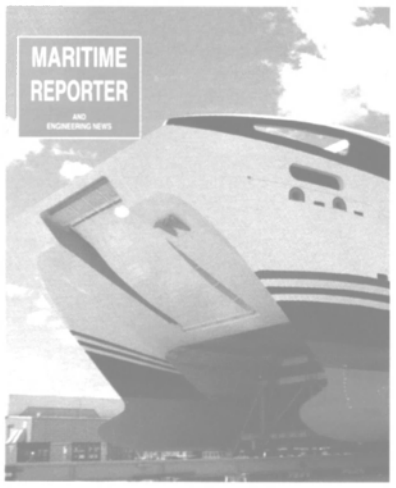
Increasingly, I find myself — both personally and professionally — falling back to tried and trusted sources of information, eschewing the urge to continually ride on the hottest fad. This is not a general condemnation of everything new; far from it. Rather, it is a far more selective approach to information assimilation and use.

When **John J. O'Malley** started *Maritime Reporter & Engineering News* (then known as *Maritime Activity Reports*) 65 years ago in 1939, *"Timely News Condensed for the Executive"* was the simple tagline that accompanied each edition. While the world has certainly changed from 1939 to 2004, I do believe that this simple mission remains the same today. Through the pages of *Maritime Reporter & Engineering News*, sister publications *MarineNews* and the recently launched *Maritime Security Sourcebook*, as well as our family of Electronic information products that include *MaritimeToday* and *The Shipbuilding Report* (www.shipbuilding.com), the entire staff here aspires to bring to you ... on a daily, weekly and monthly basis ... fresh information, insight, analysis, data and yes, even statistics, that are designed to inform, entertain and ultimately, help you run your maritime business more effectively.

As we celebrate our 65th year, I invite you to share with us your personal and professional stories that have made this industry, and this publication, such a unique success.

www.marinelink.com **trauthwein@marinelink.com**

On the Cover



On the Cover: The Auto Express 86 for Canadian American Transportation Systems (CATS) rolling out of one of Austal's building halls in preparation for launch. Inset Photo: GE's 7FDM diesel engine.

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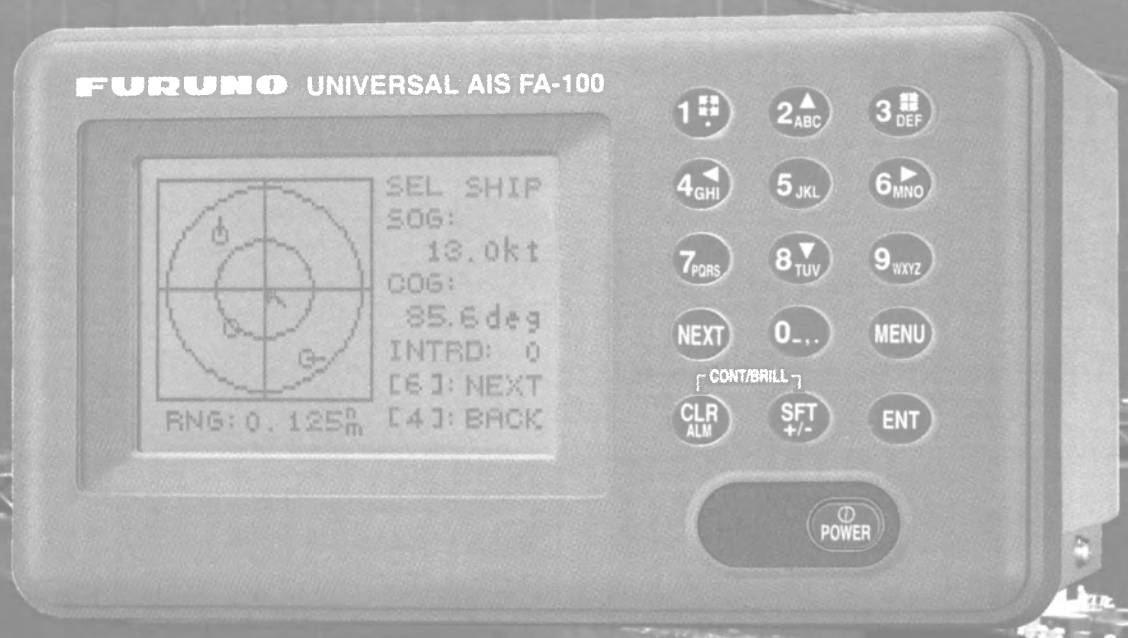

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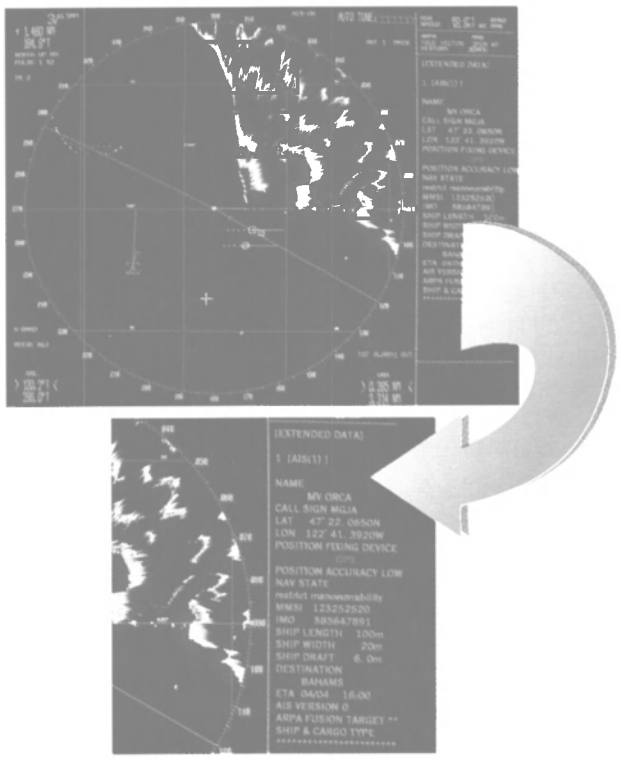

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Leading Off

65 Years Ago

Maritime Reporter & Engineering News started publishing in 1939 with the motto of "Timely News Condensed for the Executive."

MARITIME ACTIVITY REPORTS

TIMELY NEWS CONDENSED FOR THE EXECUTIVE

No. 48 November 29, 1939 Vol. I

ATLANTIC BASIN LOW ON U.S.A.T. "CHATEAU THIERRY"

The Atlantic Basin Iron Works, of Brooklyn, N. Y., submitted the low bid to the Office of the Superintendent, 58th St. and 1st Avenue, Brooklyn, N. Y., last Monday, November 27th, for the installation of additional troop accommodations and for other work in accordance with specifications.

The bids as received were as follows:

Atlantic Basin & Iron Works

1. Troop Berths	$ 6,992
2. Access to Troop Compartments	3,950
3. Lifeboat Davits and Falls	850
Total	$11,792

ALABAMA AWARDED CONTRACT

The Alabama Dry Dock & Shipbuilding Company announce that they have entered into a contract with National Bulk Carriers, Inc., of New York, to build at their Pinto Island Plant, a steel oil tank ship 360 feet long, 47.5 feet beam, 28 feet depth of hold, to be equipped with twin Diesel motors of 1,200 h.p. each, and built to Lloyd's highest Classification.

Construction will be started immediately and will be carried on by their present force.

Due to the volume of building under contract now consisting of tunnel sections and a number of steel barges, it will be necessary to extend the building ways now in use at the

TANKER DRYDOCKED AFTER EXPLOSION

The tanker J. A. Mowinckel, of the Panama Transportation Company, a subsidiary of the Standard Oil, which was damaged by an explosion a week ago Saturday while at her pier in Constable Hook, N. J., was towed to the Robins Dry Dock and Repair Company plant, in Erie Basin, Brooklyn, N. Y.

An examination of the J. A. Mowinckel will have to be made before it can be determined how long it will take to make repairs, it was announced by the Robins yard.

The officials of the Robins Dry Dock and Repair Company are as follows:

Officials — Frank V. Gilbridge, President;

Cartoon

Recycling of ships is again top news. See Dennis Bryant's Government Update starting on page 18.

Maritime Meanings

Snottie

Snottie is naval slang for a midshipman, an apprentice officer. In the early days of fighting sail, midshipmen went to sea at a very early age, often as youngsters barely newly breeched, and their nickname is said to come from thier habit of wiping their noses on their sleeves. Tradition has it that Nelson ordered three buttons to be sewn on the sleeves of midshipmen to prevent this unseemly practice. *To be snotty* is to be angry, querulous, easily irritated; from the fact that the extreme youth of the nautical snottie made him susceptible to temper and tears — until the unerring hand of naval discipline showed him the value of accepting all things to do with nautical life.

***Source**: An Ocean of Words: A Dictionary of Nautical Words and Phrases, by Peter D. Jeans; Birch Lane Press , 1998*

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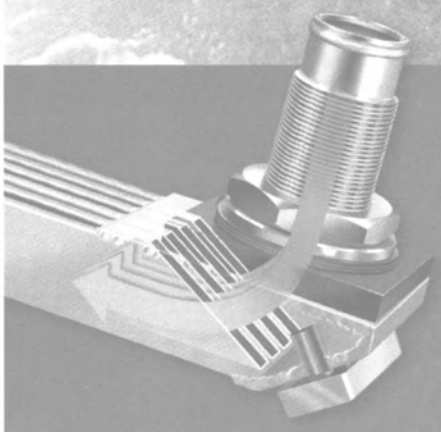

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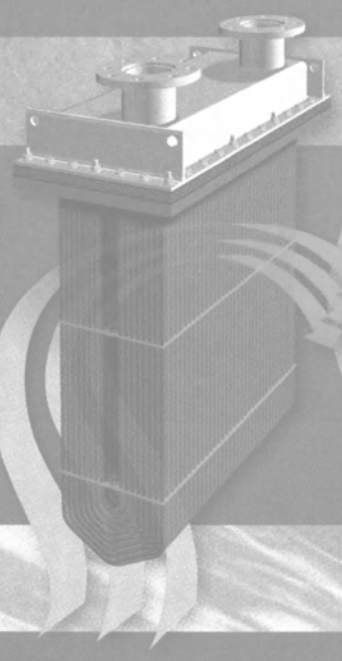

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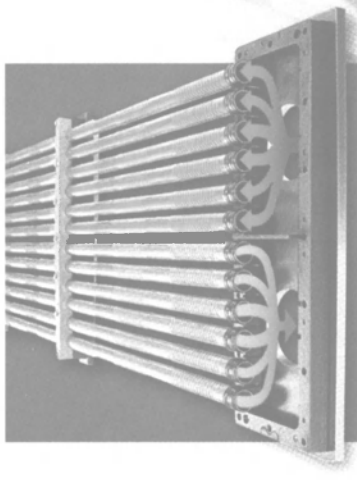

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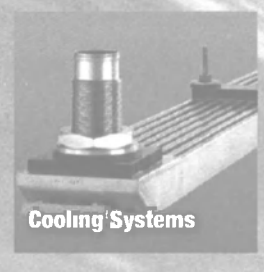

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Cruise Ship Engineers Indicted

Tom Sansonetti, Assistant Attorney General for the Justice Department's Environment and Natural Resources Division and **Marcos Daniel Jiménez**, U.S. Attorney for the Southern District of Florida, announced that three senior cruise ship engineers were indicted by a federal grand jury in Miami, Fla., for their role in concealing the overboard dumping of waste oil from the SS Norway cruise ship in false log books designed to deceive the U.S. Coast Guard. The defendants, Chief Engineers **Knut Sorboe** and **Peter Solemdal**, Senior First Engineer **Aage Lokkebraten** are Norwegian nationals who were employed by Norwegian Cruise Line Limited (NCL) at the time of the offenses. NCL, one of the world's largest cruise lines, previously pled guilty and paid a $1 million criminal fine and $500,000 in community service in connection with the case. The government's investigation began when a former NCL engineer made allegations to the Criminal Investigation Division of the Environmental Protection Agency. NCL learned of the tip and discovered environmental violations during an internal audit. The cruise line's outside auditor actually witnessed NCL engineers aboard the SS Norway in the act of circumventing the ship's Oil Water Separator, a required pollution prevention device. The engineers deliberately used fresh water to trick a machine's oil sensor designed to detect and limit the overboard discharges. NCL reported the criminal conduct to the government, which was already investigating the whistle-blower's tip, and has cooperated in the government's investigation.

"(These) charges are necessary to show both companies and individuals operating and managing ships that they may not pollute our oceans and lie to our government," said Sansonetti, Assistant Attorney General for the Justice Department's Environment and Natural Resources Division. "Corporations do not act alone but through the acts of individuals and they must also be held accountable. This prosecution demonstrates the continuing commitment of the United States Attorney's Office to aggressively prosecute environmental crimes," said Marcos Daniel Jimenez, U.S. Attorney for the Southern District of Florida Prosecutors announced that U.S. District Court Judge **Joan A. Lenard** awarded the whistle-blower $250,000. The indictment alleges that the defendants engaged in a conspiracy to use false Oil Record Books in order to conceal overboard discharges from the SS Norway without the use of a properly functioning Oil Water Separator and in order to obstruct Coast Guard inspections.

The Oil Record Book is a required pollution record that is regularly inspected and relied upon by the Coast Guard. The investigation was conducted by the U.S. EPA, Criminal Investigation Division; Coast Guard Investigative Service; United States Department of Transportation, Office of Inspector General; Federal Bureau of Investigation; Miami-Dade Police Department Environmental Investigations Unit; and the Florida Department of Environmental Protection Division of Law Enforcement. The case is being prosecuted by the U.S. Attorney's Office for the Southern District of Florida and the Environmental Crimes Section of the U.S. Department of Justice with the assistance of the EPA Regional Criminal Enforcement Counsel.

IMO Resolutions:

Places of Refuge and Ship Recycling

Member States of the International Maritime Organization (IMO) agreed on the need for an audit scheme to assess their effectiveness in implementing global shipping standards, with the adoption of an Assembly resolution on the subject at the 23rd IMO Assembly, which met at the Organization's London Headquarters from November 24-December 5, 2003. The Assembly also adopted guidelines on places of refuge for ships in need of assistance and guidelines on ship recycling. Altogether the session saw 30 resolutions adopted by the Assembly. Other issues covered by resolutions included the Organization's work program and budget for the biennium 2004-2005 and resolutions on technical issues relating to the Organization's work on safety and security of shipping and prevention of marine pollution by ships.

IMO Member State Audit Scheme

The Assembly resolution Voluntary IMO Member State Audit Scheme approved the establishment and further development of the scheme, to be implemented on a voluntary basis. It requests the IMO Council to develop, as a matter of high priority, procedures and other modalities for the implementation of the scheme. The proposed IMO Member State Audit Scheme will be designed to help promote maritime safety and environmental protection by assessing how effectively Member States implement and enforce relevant IMO Convention standards, and by providing them with feedback and advice on their current performance.

Places of refuge

New guidelines on places of refuge for ships in need of assistance were adopted. These guidelines are intended for use when a ship is in need of assistance but the safety of life is not involved. Where the safety of life is involved, the provisions of the SAR Convention should continue to be followed. The guidelines recognize that, when a ship has suffered an incident, the best way of preventing damage or pollution from its progressive deterioration is to transfer its cargo and bunkers, and to repair the casualty. Such an operation is best carried out in a place of refuge. However, to bring such a ship into a place of refuge near a coast may endanger the coastal State, both economically and from the environmental point of view, and local authorities and populations may strongly object to the operation. Therefore, granting access to a place of refuge could involve a political decision that can only be taken on a case-by-case basis. In so doing, consideration would need to be given to balancing the interests of the affected ship with those of the environment. A second resolution, Maritime Assistance Service

(MAS), recommends that all coastal States should establish a maritime assistance service (MAS).

The principal purposes would be to receive the various reports, consultations and notifications required in a number of IMO instruments; monitoring a ship's situation if such a report indicates that an incident may give rise to a situation whereby the ship may be in need of assistance; serving as the point of contact if the ship's situation is not a distress situation hut nevertheless requires exchanges of information between the ship and the coastal State, and for serving as the point of contact between those involved in a marine salvage operation undertaken by private facilities if the coastal State considers that it should monitor all phases of the operation.

Ship recycling

The Assembly adopted Guidelines on Ship Recycling, which have been developed to give advice to all stakeholders in the recycling process, including administrations of ship building and maritime equipment supplying countries, flag, port and recycling States, as well as intergovernmental organizations and commercial bodies such as shipowners, ship builders, repairers and recycling yards.

The guidelines note that, in the process of recycling ships, virtually nothing goes to waste. The materials and equipment are almost entirely reused. Steel is reprocessed to become, for instance, reinforcing rods for use in the construction industry or as corner castings and hinges for containers. Ships' generators are reused ashore. Batteries find their way into the local economy. Hydrocarbons on board become reclaimed oil products to be used as fuel in rolling mills or brick kilns.

Light fittings find further use on land. Furthermore, new steel production from recycled steel requires only one third of the energy used for steel production from raw materials. Recycling thus makes a positive contribution to the global conservation of energy and resources and, in the process, employs a large, if predominantly unskilled, workforce. Properly handled, ship recycling is, without question, a "green" industry.

However, the guidelines recognize that, although the principle of ship recycling may be sound, the working practices and environmental standards in the yards often leave much to be desired.

While ultimate responsibility for conditions in the yards has to lie with the countries in which they are situated, other stakeholders must be encouraged to contribute towards minimizing potential problems in the yards.

Teekay Sees Amended Regs as Positive

The International Maritime Organization (IMO), recently announced stricter regulations governing the tanker industry on a worldwide basis. The IMO regulations, scheduled to become effective April 5, 2005, will accelerate the mandatory phase-out of single-hull tankers as well as impose a more rigorous inspection regime for older tankers. The regulations will ban the oldest single-hull tankers, representing approximately 12 percent of the current world tanker fleet, from worldwide trading by the end of 2005. It is expected that a further 25 percent of the existing world tanker fleet will be excluded from the majority of the oil tanker trades by 2010.

Based on information provided by the IMO, 19 of Teekay Shipping's total fleet of 149 vessels will be affected by the IMO accelerated phase-out schedule, effectively reducing the economic life of each of these vessels. As a result of these regulations, the company expects to take a non-cash write-down to the book value of certain vessels totaling approximately $50 to $60 million in the fourth quarter of 2003, representing approximately 1.5 percent of the company's total assets. **Bjorn Moller**, Teekay's President and CEO, said "We view the amended IMO rules as very positive news for Teekay as one of the world's largest operators of high-quality modern tonnage. The accelerated phase-out of 12 percent of the world tanker fleet over the next two years coupled with the forecasted increase in global oil demand should offset the current tanker orderbook. As a result, we expect the current tight balance between tanker supply and demand to continue during this period. These regulations should also lead to increasingly difficult trading conditions for single-hull tankers from 2010, if not sooner. It is therefore appropriate to take a write-down due to the likely discrimination against single-hull vessels." The table below compares the composition of Teekay's fleet with the world tanker fleet as of December 1, 2003. Over 83% of Teekay's fleet is either double-hull or double-bottom/sided which are unaffected by the IMO accelerated phase-out schedule, compared to approximately 68% of the current world tanker fleet.

Vessel Category/Age	% of the Teekay Fleet (1)	% of the World Tanker Fleet (1)(2)
Double-hull	76.2%	58.6%
Double-bottom/sides	7.2%	9.0%
Single-hull (0-15 yrs)	16.1%	16.1%
Single-hull (greater than 15 yrs)	0.5%	16.3%

(1) Based on total deadweight tons (excluding newbuildings on order)
(2) Source: Clarkson Research

Thomas B. Crowley Sr., Scholarships Presented

Continuing its tradition of supporting academic excellence, Crowley Maritime Corp. recently presented Thomas B. Crowley Sr. Memorial Scholarships to two midshipmen from the U.S. Merchant Marine Academy at Kings Point, NY.

Mark Miller, director of corporate communications for Crowley, presented scholarships to **Jeffrey Jaskot** and **Audrey Meyers**. Midshipman Jaskot, of Orlando, Fla., is a senior majoring in Logistics and Intermodal Transportation and plans to attain a U.S. Coast Guard Unlimited 3rd Mates License. He also is in the process of achieving a Tankerman PIC Rating as well as Crude Oil Wash and Inert Gas Endorsements. Upon graduation, Jaskot plans to use his license and go to sea. He interned at Crowley in the summer of 2003. As a cadet, Jaskot has sailed aboard several ships, including the Central Gulf Lines Green Lake, the USNS Leroy Grumman with the Military Sealift Command, and the APL ship President Jackson. While at Kings Point Jaskot has been an active member of the tennis team, a founding member of the surf club, and been involved in various church activities and other community service works. He was awarded a $4,000 scholarship.

(L to R) Midshipman **Audrey Meyers**, Midshipman **Jeffrey Jaskot** and **Mark Miller**, Crowley Director of Corporate Communications

Midshipman Meyers, of Great Neck, NY, is a senior majoring in Marine Engineering Systems and plans to attain a minor in Aeronautical Engineering. As part of her training at sea, she has visited 15 different countries, including Greenland and Taiwan, and plans to go back to sea after graduation. On land, Meyers is a two-year captain of the women's swim team where she holds six academy records and was voted the most valuable player her team for the 2002-2003 season. She was also the chairman of the Ring Committee for the Class of 2004, and is currently the Regimental Operations Officer - the third-highest ranking regimental officer - in charge of planning daily activities. She was awarded a $2,000 scholarship.

Eastern Shipbuilding Wins Casino Vessel Contract

The Big M Casino, Inc. of Fort Myers, Fla., has awarded a contract to Eastern Shipbuilding Group, Panama City, Fla., to construct a casino vessel. The as yet unnamed vessel will join the existing vessel, Royal Gambler, in providing off-shore casino services to the Fort Myers market. The vessel was designed by John W. Gilbert and Associates, a prominent naval architect firm located in Hingham, Mass..

The interior design will be performed by Bauer Interiors of New Orleans, La. The vessel is 186 ft. long with a beam of 38 ft. and a molded depth of 11.5 ft., and depending on conditions, will have a loaded draft of 8 ft. She will accommodate 600 passengers plus a crew of 72. The new vessel will be powered by two Caterpillar 3508B DIT main engines, which produce 1,100 hp @1,800 rpm. The main engines are coupled to a pair of Twin Disc MG-5301-DC 4, reduction gears with a 6 to 1 ratio. Electric power will be supplied by two Caterpillar 3408 DITA generators, which each produce 370 kW @ 1,800 rpm. Keel Coolers will be provided by R. W. Fernstrum, Steering & Engine Controls will be Kobelt, and a 200 hp bow thruster will be supplied by American Bow Thruster. The vessel is scheduled to be launched September, 2004 with Delivery scheduled for December, 2004.

Treasury Changes Terrorism Risk Insurance Program

The Treasury Department reminded all participants and observers of the Terrorism Risk Insurance Program that there will be two important changes in the program's administration in 2004.

As mandated by Congress, beginning on January 1, 2004 and throughout the remainder of 2004, an insurer's deductible will increase from 7 percent to 10 percent of the insurer's direct earned premium over the previous calendar year. Second, the "mandatory availability" provisions of the Act will require insurers to continue to make available coverage for certified acts of terrorism for the full annual policy periods of all commercial property and casualty insurance policies that are issued or renewed in 2004. The "make available" requirement under the Act applies to December 31, 2004 while coverage issued as a result of the requirement will extend for the normal annual policy period beyond 2004. As required by the Act, the Treasury Department will be evaluating whether the "mandatory availability" provisions should be extended for policies that are issued or renewed in 2005.

Kongsberg Launches DPS for Workboat Market

Kongsberg Marine launched the Compact DP Series from Kongsberg Maritime. A solution for the smaller vessel and operator, it offers a complete DP class 1 solution for dynamically positioned vessels and is designed to meet the requirements of Offshore Service Vessels and workboats. The system consists of two main components, the cPos and cJoy, both of which use Kongsberg RCU technology, within the (cPos or cJoy) Compact Controller. This forms the heart of the system and is scalable to fit any DP class 1 system.

The controller's main function is to implement DP and joystick control algorithms, take actions as to operator commands and the information collected and processing from the various sensors in the DP system. These actions are converted by the Compact Controller to the signals that operate a vessel's propulsion and thruster systems. The cPos is designed to provide full Auto Position functionality with options for Auto Pilot

control, Line Tracking mode and Follow Target. The system is designed to interface with DGPS, Fanbeam, gyros, MRU, anemometer and thrusters as standard though several interfaces are available as options including HiPAP hydroacoustics and diesel-electric power plants. The cJoy system adds wind-compensated joystick control with automatic heading control and optional simple station keeping to the Compact DP Series. The cPos and cJoy are controlled via the cPos OS-520 Operator Station or cJoy OT-520 Operator Terminal, respectively. These user friendly tools provide the facilities for vessel control via joystick, DP and autopilot. The cPos OS-520 is ergonomically designed for simple control adjustments and commands, and features a 17-in. color TFT display, three-axis joystick and quick access buttons for intuitive operation. The cJoy OT-520 is equal to the cPos OS-520 but is delivered without an external TFT display. The cJoy Bridge Wing Terminal can be interfaced to any of the two operator units and mounted outdoors.

Circle 50 on Reader Service Card

Golar LNG Acquires 9.9% of Korea Line

Golar LNG Ltd. has acquired 9.9 % of the shares in the Korean shipping company Korea Line. Korea Line is listed on the Seoul Stock Exchange and has a market capitalization of around $130 million. Korea Line owns directly 100% of two modern LNG Carriers on long term charter to KOGAS. The company has also smaller ownership in four other large LNG carriers also on long term charter to KOGAS.

Golar sees the investment in Korea Line as an interesting opportunity to develop a positive relationship to mutual benefit to one of the leading Asian LNG Shipping providers.

Mulholland Retires from Matson and A&B

After more than 38 years of service, **C. Bradley Mulholland** retired, effective January 1, 2004, from both Matson Navigation Company, Inc., which he serves as vice chairman of the board. He also will retire from his position as executive vice president of Alexander & Baldwin, Inc., Matson's parent company, and from director positions on the boards of both companies. Mulholland joined Matson in 1965 and served in a variety of increasingly responsible positions throughout the company, ultimately being named president and chief operating officer of Matson in 1990, and then president and chief executive officer in 1992. He became vice-chairman of the board in 2002.

New Commander for Navy's Carderock Division

Captain **Charles D. Behrle** USN relieved Captain **Steven W. Petri** USN as 32nd commander of the Naval Surface Warfare Center's Carderock Division October 28th, 2003. Captain Behrle leaves his NAVSEA post as technical director of the DD(X) Program, a vessel destined to be the Navy's premier multi-mission destroyer for the 21st century. A Connecticut native, Captain Behrle (U.S. Naval Academy '80) earned a B.S. in math. He began his career aboard USS STARK (FFG 31). In 1985, he went to the Naval Postgraduate School, Monterey, California for an M.S. in Electrical Engineering. While there, he was selected for engineering duty. Personal decorations include the Meritorious Service Medal (with two gold stars), the Navy Commendation Medal (with three gold stars), and the Navy Achievement Medal.

NEWBUILDING PRICES

"Happy" New Year?

Little more than 12 months ago newbuilding prices had been drifting down steadily for more than a year and some industry analysts were warning that soft ship prices could be here for some time. Simultaneously, the closure of some yards were more than offset by the opening of new ones, particularly in China, while improvements in productivity were constantly adding capacity.

Some brokers and industry analysts were warning of surplus capacity, not just in containerships, but in the Aframax, Suezmax and 45,000 dwt products carrier range.

What a difference a year makes.

Today the picture is radically different. The container, tanker and bulk carrier markets are all buzzing, with certain sectors of the dry bulk market reaching record levels, beyond most owners' wildest dreams. The world's shipyards are full, almost without exception, for the next three years and some builders are now taking orders for 2007 delivery. New ship prices are rising dramatically (see table) and the markets are so buoyant that there are few re-sales available. Secondhand vessel values are spiralling, with some buyers prepared to offer over the odds just to secure the tonnage they want.

There are significant new ship price rises in both the dry and liquid sectors. But it is the increase in the cost of Capesize units that is the most dramatic. Fuelled largely by Chinese demand for iron ore and coal, Capesize charter rates have climbed to unprecedented levels, pushing up both new and secondhand prices too. Newbuilding brokers believe it is only a matter of time before the price tag for a new Capesize will start with an almost incredible five. However, shipbuilders may not have it all their own way. Iron ore prices are climbing, which could soon manifest into rising steel prices.

Newbuilding prices

Tanker prices

	Latest	Average (2002)
VLCC	$76 m	$65 m
Suezmax	$52 m	$44 m
Aframax	$42 m	$35 m
Panamax	$33 m	$29 m
Products	$31 m	$26 m

Bulk Carrier prices

	Latest	Average (2002)
Capesize	$48 m	$35 m
Panamax	$26 m	$20 m
Handymax	$23 m	$17 m
Handysize	$18 m	$14 m

REPAIR STANDARDS

Standardizing Contracts

Contracts relating to the broad range of ship repairs have not, traditionally, lent themselves to any form of standardization. That could all be changing, London law firm Ince & Co., has made recent effort with Bimco's Documentary Committee to develop a standard ship repair contract. Part I of REPAIRCON, Bimco's standard contract, is set out in the usual Bimco format — with boxes to be completed covering key details of the contract and its main terms. These include place and date of repairs, identity of owner, contractors, vessel, repair yard, delivery and cancellation dates, etc. REPAIRCON's Part II contains the main terms defining rights and obligations. These can be amended or deleted, says Ince, while warning that "great care needs to be exercised to guard against confusing the balanced allocation of risk and responsibility". The law firm is clearly impressed with Bimco's efforts: "Brevity and clarity have always been guiding principles of Bimco forms and, to that end, REPAIRCON addresses the main commercial terms required for a notional contract of one month's duration." However the lawyers draw attention to Bimco's advice that for shorter or longer contracts, and for conversion work, the standard form may need to be carefully modified. "It will also be important to include tailor-made clauses dealing with technical and practical issues, particular the allocation of responsibility for safety and procedures for ensuring that the repairs are monitored and carried out safely in accordance with application safety management systems," Ince notes.

WORLD'S LARGEST

Jahre Viking to Get $22 Million Make Over

Dubai Drydocks has won a $22m contract from Norway's First Olsen Tankers to convert the world's largest ship, the 564,763 dwt ULCC Jahre Viking, to a specialized 4.2 billion barrel Floating Storage unit for a five-year charter by Maersk Oil for the Al Shaheen oil field off the coast of Qatar. The vessel has already arrived in Dubai with the conversion program due to be completed by June 2004. This is likely to be the final phase in a chequered history for this ship. She was originally ordered by Nomikos as a 400,000 dwt unit in the seventies in Japan, but, following the collapse of the oil markets in mid-1974, construction was halted. The hull was then purchased by Hong Kong's C Y Tung — lengthened to her current size, and sailed first as the Seawise Giant. She was attacked during the Iran/Iraq War during the late eighties and was expected to be classed as a Constructive Total Loss (CTL). However, Norway's **Anders Jahre** purchased the hull and she was rebuilt in Singapore's Keppel Shipyard during 1991, sailing out of the yard as the Jahre Viking.

OPA 90 & the War on Terror

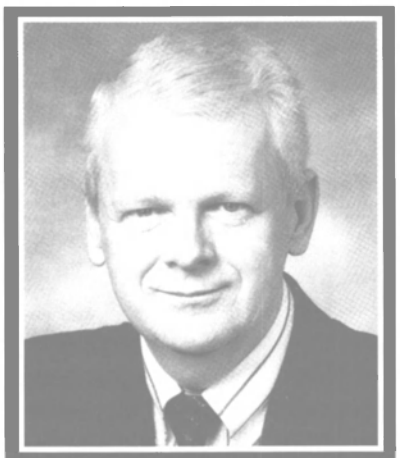
According to the USCG, oil spills have been reduced by roughly 90 percent since OPA90 was passed some 12 years ago. Encouraging, but statistics are often misleading. It would be a reasonable assumption that the oil that was spilled was a result of human error or equipment failure; not spilled intentionally.

On September 10, 2001 you could base the potential for spills on past incidents. All that changed when we got our wake-up call the next morning. "9/11 showed us...the terrorists used our own infrastructure against us," says Admiral **Vivien S. Crea**, First Coast Guard District, Boston. We realize now that there are those who would benefit from intentionally spilling oil...and the more the better. OPA90 was not designed for this scenario. It's been over two years since 9/11 and domestically it's been quiet. The peaceful passing of time has an unfortunate way of lulling one back to sleep. But has the threat really gone away? They say 9/11 was planned as long as five years before it was carried out. "What happened with airplanes can also happen with ships, when you talk about passenger ships with over 2,000 people or a gas tanker, which is a floating bomb. It could destroy a whole city. It is the same with oil tankers," warns **Henri van Berlo** of Bureau Veritas, Dubai. The new ISPS Code goes a long way in assessing and preventing terrorist incidents but does not address marine casualty response. The results of a terrorist incident would be the same as those OPA90 was created to avert: another catastrophic, environmental disaster... in addition to the lives that would also be lost. Admiral Crea acknowledges that disruptions to our rigid waterways system are harder to overcome than the airlines. Protecting all 360 ports and the inland system at all times will be a daunting task. All it would take is one ship to sneak through. There were more than 270 piracy attacks worldwide over the last 12 months; six in our very own Gulf area.

"While there is always room for improvement in the management and operation of ships, no amount of fresh regulatory action will eradicate the potential for another Prestige. The obvious counter, therefore, is to reinforce salvage cover in areas of the world that are heavily trafficked and environmentally sensitive," said **Joop Timmermans**, President, International Salvage Union. OPA90 accomplished the mission of its time but in this post-9/11 era it has become inadequate. But there is new legislation on our drawing boards that would go a long way towards closing the gaps in OPA90. This new proposed rule, known as the Salvage and Marine Firefighting Requirements, will require pre-positioned salvage assets and the capability to quickly respond and contain worst-case maritime disasters. USCG has delayed the rule, and it's now more than a year since they closed the public comment period, citing the need for time to evaluate the enormous amount of comments. The rule is good but difficult to accept by those who would end up footing the enormous bill. If protecting critical energy infrastructures is vital to Homeland Security, then sooner is better than later to pass this much needed regulation. The time is right.

***Rick Fernandes** is Emergency Response Manager for JMS Naval Architects & Salvage Engineers.JMS offers salvage engineering response 24/7 and wrote the authoritative text on the subject, Marine Casualty Response. Learn more about JMS at: jmsnet.com. Rick can be reached at: rick@jmsnet.com.*

Recycling of Ships



Dennis L. Bryant, Senior Maritime Counsel at the law firm of Holland & Knight, Washington, D.C., is a contributing editor of MR/EN.

By Dennis Bryant

As of July 1, 2003, there were approximately 29,000 commercial self-propelled ocean-going ships worldwide in excess of 1,000 gross tons each. Of these, just over 400 are U.S. flag. In addition, there are approximately 3,000 U.S. barges of over 1,000 gross tons each. Approximately 25% of these ships and barges are more than 20 years old and will be taken out of service in the near future. The vast majority of the ships and barges taken out of service will be recycled (scrapped). Exactly when a ship is taken out of service is dependent upon a variety of factors, the most important being its maintenance costs and its current charter rate. Thus, the number of ships being offered for recycling can and does gyrate widely over time.

There is growing realization that ships (and, to a lesser extent, barges) frequently contain hazardous materials. These materials may become hazardous wastes when a ship or barge is to be recycled. Ship recycling in the United States and many other countries in the developed world is subject to environment controls. Such recycling in lesser developed nations is not currently regulated to the same extent.

Many nations are party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. This Convention is intended to prevent hazardous wastes from being transported to another country for disposal unless the receiving country has provided knowing consent to such action. Ships being transferred from one party state for recycling in another party state appear to come within the Convention, although there is some uncertainty in this regard.

While the United States is not party to the Basel Convention, it has adopted domestic legislation having the same impact. The Resource Conservation and Recovery Act (RCRA) provides, in pertinent part, that hazardous waste may not be exported from the United States unless various conditions are met. The person who intends to export the hazardous waste must provide written notification to the Environmental Protection Agency (EPA). The notification must contain the name and address of the exporter, the types and quantities of hazardous waste to be exported, the date of the planned exportation, the port of entry at destination, the method of transport, the name and address of the ultimate disposal facility, and the names of any transit countries through which the hazardous waste will be sent.

The United States is party to several international agreements concerning international trade in hazardous waste. The primary agreement is among member countries of the Organization for Economic Cooperation and Development (OECD). These agreements share the basic principles of notification by the exporter to the government of the exporting country, government-to-government notification to the receiving country, and receiving country consent to the shipment.

More broadly, the International Maritime Organization (IMO) is developing guidelines on ship recycling that may lead to mandatory requirements for an inventory of hazardous material on the ship. This inventory would be initiated during construction and continue to be maintained until the ship is recycled. At the same time, the International Labor Organization (ILO) is developing guidelines for ship-breaking. These standards would address working and environmental conditions at locations where ships are to be recycled.

The EPA has specifically examined the ship scrapping and recycling industry. The agency has identified a variety of hazardous wastes commonly associated with ships being scrapped or recycled. These hazardous wastes include polychlorinated biphenyls (PCBs), asbestos, heavy metals, pesticides, and waste oils. These hazardous wastes must either be removed from the ship prior to export or the consent of both the EPA and the receiving country must be obtained before a ship can be exported from the United States for recycling in a foreign country. The International Chamber of Shipping (ICS), in conjunction with other maritime organizations, developed the "Industry Code of Practice on Ship Recycling." This Code provides that, when a ship is to be sold for recycling, the owner will inventory the potentially hazardous materials on board and take steps to minimize those materials before the ship is delivered for recycling. The Code also contains a list of potentially hazardous and toxic materials frequently found on ships.

The EPA restrictions on export of ships for recycling have been applied to government ships. The Maritime Administration (MARAD) encountered

various obstacles and added expense in disposing of obsolete vessels from the National Defense Reserve Fleet (NDRF). After MARAD awarded a contract for the recycling of 15 NDRF ships at a facility in the United Kingdom, suit was brought by several environmental advocacy groups to block the exportation. The complaint alleged a number of violations of law, including the failure to conduct an environmental assessment and the failure to obtain an exemption from the EPA for the export of PCB for disposal.

The trial court allowed the export of four obsolete MARAD ships as a Congressionally-approved pilot program, but has granted a temporary restraining order against export of any further vessels. The major finding of the court in prohibiting further vessel exports is the apparent violation of the ban on export of PCB without an EPA exemption. Subsequently, the UK Environment Agency withdrew approval for the ships to be recycled, noting that the contractor had not obtained permission to expand its facility to perform such work. The four NDRF ships may be returned to the United States in the spring, unless the matter can be sorted out.

As important as the litigation surrounding the export for recycling of the obsolete MARAD vessels is the contract that MARAD awarded for this disposal. Whereas the traditional arrangement for recycling of ships involves the sale of the ship for its so-called scrap value, the MARAD arrangement provided for MARAD to pay the contractor $14.8 million for removal and recycling of 15 ships. The high visibility of these exports and the government status of the ships were, no doubt, major factors in this unique arrangement. This payment for recycling of ships, though, alters the traditional view that ships always retain a certain minimal value (the value of the steel and related material in the hull).

The French Government is involved in a similar controversy regarding efforts to recycle the retired aircraft carrier Clemenceau. The ship apparently contains over 200 tons of asbestos. Efforts to have the ship recycled in Turkey met with protests and the ship has been returned to France for removal of the asbestos and any other hazardous waste.

Lest anyone think this problem is exclusive to government vessels, your attention is invited to the chemical tanker Sandrien. This ship, suspected of having onboard asbestos and various hazardous chemicals, has been tied up the Netherlands since 2001. The owners have been unable to obtain clearance from the Dutch government to send the ship for recycling in India because the government is requiring full compliance with the Basel Convention.

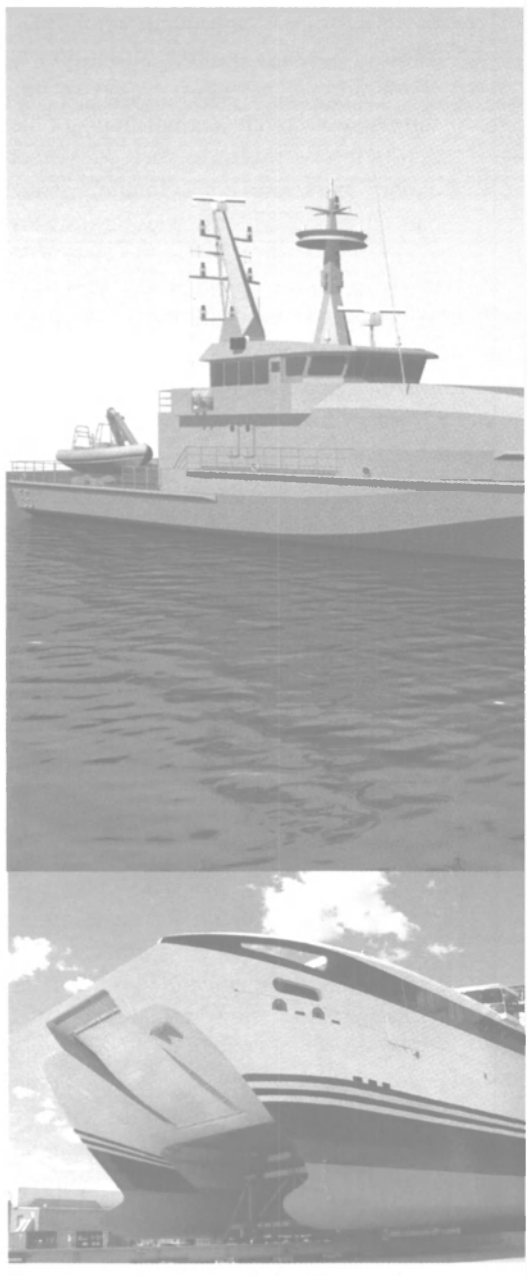
Due in large part to heightened environmental concerns and new apprehensions about the safety and health of employees of ship recyclers, we may be approaching the day when owners of both government vessels and regular commercial ships will regularly pay to have their ships recycled. Minimalization and monitoring of hazardous materials on ships is highly recommended.

Fast Ferries Still a Core Market for Austal

Although it has diversified into other vessel types in recent years, Western Australian based shipbuilding group Austal still counts fast ferries as a core market.

The last year has been no exception, with the biggest news being the June announcement of an order for what will be the world's largest high-speed multi-hull vessel. Even more significant than the vessel's 126.7 m length overall is the fact that the cargo-vehicle-passenger ferry will be based on slender stabilized monohull hullform (more commonly referred to as a trimaran).

While the experienced high-speed builder from down under touts the commercial value of the project, ramifications for its military aspirations, particularly with the U.S. armed forces, are clear.



The Auto Express 86 for CATS rolling out of one of Austal's building halls in preparation for launch.

"We expect this breakthrough project to generate considerable interest among ferry operators and it clearly demonstrates Austal's ability to produce high-speed ships of the size currently being sought by the U.S. military," said Austal's Managing Director, **Bob McKinnon**.

The reference relates in particular to

Austal's involvement in the USN's Littoral Combat Ship (LCS). Austal is providing its expertise in the design and construction of aluminium ships to the Bath Iron Works (General Dynamics) team that was awarded one of three design contracts for the LCS project.

With power provided by four MTU 20V 8000 diesel engines driving three Kamewa waterjets, the Auto Express 126 trimaran will be able to maintain a service speed in excess of 40 knots and provides the capacity to carry 1,350 passengers, over 340 cars and a substantial number of trucks. At the same time, the seakeeping performance of the trimaran is designed to provide passengers with a high comfort level.

"The characteristics of this new vessel, with a length of 126.7 m and beam of 30 m, will improve overall efficiency in terms of passenger capacity, deadweight and freight lane metres by more than 35%. At the same time passenger comfort will increase by 25% to 40% depending on the routes we operate," said **Fred Olsen Jr.**, the company's Executive Chairman.

The Spanish company took delivery of its first Austal-built fast ferry last September in the form of the 66 m catamaran Bocayna Express.

Austal's next vehicle ferry deliveries include a 56 m catamaran for Tahiti that is configured to carry 700 passengers and 30 cars and the company's seventh Auto Express 86 catamaran. This vessel is particularly significant for Austal Ships as it is the company's first sale into the North American market. Built for U.S. company Canadian American Transportation Systems (CATS), the ferry will operate across Lake Ontario at well over 40 knots, linking Rochester, NY with Toronto, Canada.

With two passenger decks housing 774 passengers and space for some 238 cars, Spirit of Ontario will enter the Great Lakes system as soon as the St. Lawrence Seaway re-opens. It will not be the only Austal ferry passing through during the course of 2004, as Austal

While Australian builders count the fast ferry market as a top priority, entry into military markets particularly in the U.S., is priority "1A" at worst. Pirctured is an artist's impression of Austal's 56 metre patrol boat for the Royal Australian Navy.

The 66 metre catamaran Bocayna Express.

USA, the company's Mobile, AL shipyard, is currently building a 58 m vehicle-passenger catamaran for Lake Express LLC. This is scheduled to begin operations across Lake Michigan by this summer.

With capacity for 253 passengers and 46 cars, the Auto Express 58 is designed for a speed of 34 knots, and is the largest vessel built at Austal USA to date. The yard has previously completed two passenger-only high speed catamarans, two dinner cruise vessels and a pair of fast crew/supply boats.

Interestingly, there is already an Austal vehicle-passenger catamaran flagged to the United States registry — the Theatre Support Vessel WestPac Express. Having already completed over two years of service supporting the operations of the U.S. Marine Corps' Third Marine Expeditionary Force (III MEF) in the Western Pacific theatre, during 2003 the 101 m catamaran achieved the distinction of becoming the first large high speed vessel to be registered and flagged as a commercial ship in the U.S.

Capable of sustaining loaded speeds of 36 knots, the diesel-powered ship can deploy a complete battalion of 970 Marines and up to 550 tons of vehicles and equipment in a single lift. WestPac Express has covered 150,000 nautical miles in two years, many of them open sea passages in challenging sea conditions, and yet lost only four hours operation to technical delays.

Austal Ships is also currently involved in other defence related projects, including the construction of three 22 m Coast Guard vessels for Kuwait and a fleet of ten 37.5 m naval patrol boats for another Middle East nation.

Image Marine to Build New True North

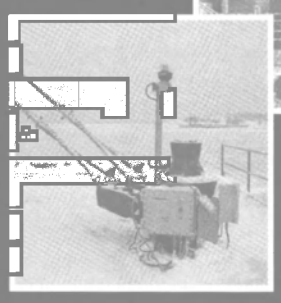
Image Marine will build a live-aboard adventure vessel for North Star Cruises. North Star Cruises took delivery of its first live-aboard, the Image Marine-built True North, in January 1999. With capacity for 28 passengers in 14 cabins, the 34.5 m vessel has proved successful cruising the remote Kimberley region of North Western Australia.

North Star Cruises Director, Mr **Craig Howson** said "The performance of 'True North' has been outstanding and is a testament to the shipbuilding skills of the Image Marine team; their reputation in the live-aboard market is excellent and our experience with the company through our previous build certainly gave us the confidence to build with them again." The new True North will be a 49.9-m, 36 berth - aluminium monohull. On board, North Star Cruises has upgraded the standard of cabins compared to the previous vessel, and offers three options; four premium staterooms on the upper deck, six staterooms on the main deck and eight large double cabins on the lower deck. The increased common area is split over two decks on the new vessel offering an alternative to the adjacent lounge-dining area on the original 'True North'. Dining takes place on the main deck and the lounge-bar is located on the upper deck and opens onto an outdoor area, providing guests with a spectacular viewing platform on which to wind down after a day filled with fishing, diving and touring. Scheduled for delivery in February 2005.

Integrated Mooring Systems: The Way of the Future

Arguably the only bulk-transport vessel that didn't require mooring was Noah's Ark. But it's a different world today. A world where millions of gallons of potentially hazardous cargoes are shipped between the jetties of the world's major cities, often within congested ports. Making these vessel moorings as safe as possible is Harbour & Marine Engineering's chief objective.

Established for over 30 years, this ISO900:2000-accredited Melbourne (Australia)-based company specializes in the design and manufacture of jetty mooring systems and offshore products to the international oil, gas, and bulk material industries. The products are available separately or as integrated systems, with hardware and software designed in-house, ensuring systems are correctly configured and matched to each project.



Left: Quick Release Hooks for all conditions: Portland Pipe Line Corporation, Maine.
Top: Cove Point LNG berth following upgrade.
Right: Custom-designed rotating hook units at the Rodeo Refinery in California.

Today, the majority of new jetties handling hazardous cargoes are specified with Quick Release Hooks, Capstans and Mooring Load Monitoring as standard.

Optional Remote Release and Docking Aid systems may also be included depending on location, environmental factors and operational preferences.

These systems have proven their effectiveness in increasing both vessel and operator safety through monitoring mooring data during vessel berthing and whilst alongside, and making this data available to key personnel.

Cove Point LNG Facility

Dominion's Cove Point LNG terminal at Chesapeake Bay has seen significant improvement in productivity and safety with the purchase of replacement mooring equipment, which comprises two main LNG berths. HME designed and manufactured two complete mooring systems for these berths. The systems include single, double and triple 75 ton Quick Release Hooks and capstans with remote electric release. All hooks include SmartHook load monitoring which provides display of real-time loads at each hook unit and on the central monitoring PC in the control room. SmartHook Laser Docking Aid systems and Environmental Monitoring have also been incorporated. Key mooring data can be accessed anywhere on the ship or jetty using hand-held pagers. These display environmental data, hook load alarm status and docking information.

Circle 53 on Reader Service Card

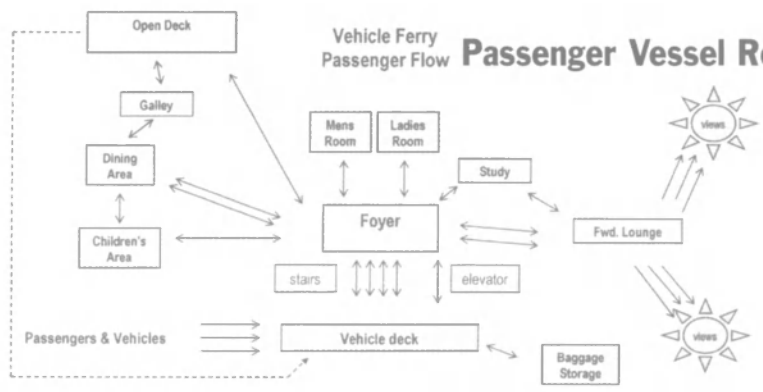
Ferry Boat Interiors

By John W. Waterhouse, P.E.
President
Elliott Bay Design Group, Ltd.

It is late in the day and you are anxious to get home. You drive onboard the ferry, park your car and head up to the passenger lounge. As you pass through the door at the top of the stairs, what will you see and experience? That is the challenge in designing ferry interiors.

As a naval architect I see several layers of thought that go into the design of an effective interior layout. The first has to do with an understanding of the passenger. While on a ferry, whether it is for a 30 minute trip or a two hour trip, the passenger needs some essential services and likely desires some beneficial services. Examples of essential services are places to sit and restroom facilities. Examples of beneficial services include a hot food service and workspaces for people with computers. In Seattle, the opportunity to purchase an espresso drink likely falls into the essential service category. In any case, the array of necessary and beneficial services that should be considered depends on the length of route and the type of passengers. For example, if the ferry provides transportation for school children on a regular basis, the interior should have some furniture and decorations to suit that group of riders. As with any vessel, the list of wants and wishes needs to be balanced against the space available and the construction budget. This is the process known as space planning.

One way to create a space plan is through use of bubble diagrams (see example) where each activity or space gets a bubble. The size of the bubble depends upon the percentage of rider-ship likely to engage in the activity while onboard the vessel. Bubbles connected by arrows show the level of interaction between activities or show passenger movement between spaces. For example, eating food and working on homework for school children both require seating and a tabletop. However, studying also needs a quiet space which may be in conflict with the noise of a dining area. A bubble chart can provide a quick understanding of the relationships between different spaces onboard a ferry.



Another layer to the interior design is the circulation paths for the passengers and the requirement for rapid egress in the event of an emergency. This ties into the space planning because the width of corridors and doorways must be proportionate to the number of people using the space. For example, on our late afternoon ferry crossing, people will likely leave their cars, go get something to drink at the snack bar and then find a space to sit and read. Others may go directly to the seating area and meet with other regular commuters to discuss the events of the day. The designer should spend time observing the ferry operation and its passengers to understand the dynamics of the riders.

In parallel to the space planning and the access/egress planning, the designer needs to be constantly aware of the constraints imposed by climate, regulations, and physics of a vessel underway. The interior must accommodate fire protection features, allow ease of movement by passengers with disabilities, and provide a suitable environment as regards air quality, noise, vibration, and temperature. It needs to be maintainable and fit within the structural constraints of the vessel's design. Finally, the designer has to be understanding of how the weight of interiors located high in the vessel can dramatically affect the intact and damaged stability. With a solid foundation of space planning and the framework of physics and regulations, the designer can now turn his/her thoughts to the appearance of the interior and its relationship to the marine scenery on the exterior. This requires a mind that can think in three dimensions and visualize the final results. It helps to be fluent in the language of architecture because there is a unique and specific vocabulary for elements such as pilasters, crown moldings, mullions and muntons, jalousies, pediments, and alcoves. History has given us a rich mix of stylistic elements to choose from, ranging from the French Rococco to Art Nouveau and from German Bauhaus to Japanese Modern. The designer must consider natural light, the use of shadows, the difference between daytime and nighttime, the textures of different surfaces, the use of colors and of reflective materials. All these elements add up to create a message to the passenger. Architecture can communicate excitement or calm, present a sleek modern technology or traditional proven approach, stimulate conversation or promote reflection. The good designer will work with the vessel owner to incorporate their corporate philosophy into the appearance of the vessel. If well done, a ferry interior can speak to the passenger on many levels and provide a level of satisfaction that transcends basic transportation.

This goal of exceeding expectations need not involve great cost. It requires good design. Let's make sure that our passenger entering the ferry gets a message that reinforces all of the other benefits of traveling by water.

Passenger Vessels : What's in Store in 2004?

By Larry Pearson

The passenger vessel market is a classic mature marine market. Segments of it are doing well, while other parts have literally died. For example, the overnight segment of the market saw one substantial vessel delivered in 2003 with none on the horizon for 2004.

Overnight Vessels

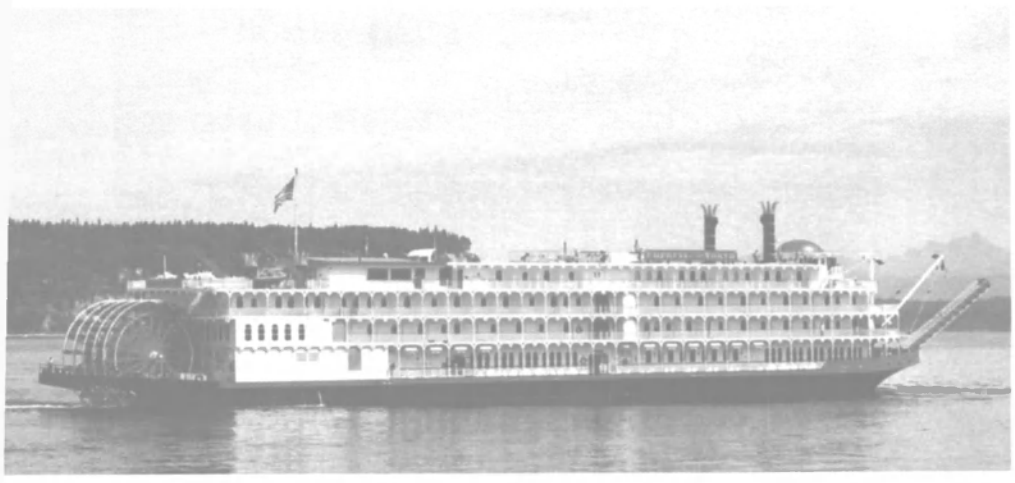
The Empress of the North, a 360-ft. sternwheeler was put into service in September working the West Coast-Alaska route. Now that ice is a problem in Alaska, the vessel is working the Columbia River system in the Northwest U.S. The vessel was the largest vessel ever built by Nichols Brothers Boat Builders, Freeland, Wash. and is owned by American West Steamboat Company, Portland, Ore.

Developing overnight service is the most difficult part of the passenger vessel industry to get established. American West has and previous companies have been in the region a long time and have a smaller version of this vessel, Queen of the West, operating on the Northwest river routes as well. The Empress of the West will resume Alaskan service in the spring.

Not only is operating overnight passenger vessels a tough market to crack, the failure of the two 300 passenger overnight vessels built two years ago by American Classic Voyages has definitely put a chill on the American flagged overnight market. The fact that no one has stepped to buy these vessels out of bankruptcy for dimes on the dollar is further indication that this market is in a decline from a vessel construction standpoint.

There is one overnight cruise ship under construction in the U.S. It is a 220-ft., 100 passenger vessel with 51 staterooms. The shipyard building the vessel is Chesapeake Shipbuilding, Salisbury, Md. Owner of the vessel is American Cruise Lines, Haddam, Ct. The vessel has been launched and is currently in an outfitting dock at Chesapeake. To be called the American Spirit, the vessel will join the American Eagle and the American Glory on inland river voyages in 2005. The two existing vessels each have 31 staterooms and were both built at Chesapeake Shipbuilding in 2000 and 2002 respectively.

All three steam powered paddlewheelers of the Delta Queen Company resumed service in 2003 and one change will happen in 2004. The largest of the vessels, American Queen, will depart from its usual itinerary. Typically this vessel and its two sister ships Delta Queen and Mississippi Queen sail round trips out of New Orleans in the winter and spring and gradually work the upper Mississippi and Ohio Rivers as the



ABOVE: The only overnight passenger vessel flying a U.S. flag built in 2003 was the Empress of the North. The vessel runs trips to Alaska when the weather is moderate and Columbia River system at other times in the year.

LEFT: The Duchess of Pintail set for a luncheon cruise around the Baltimore Inner Harbor. (Photo by Duchess of Pintail)

BELOW: Two of the 68-ft. 230 passenger tenders built by Island Boats head out to a RCCL cruise ship from their dock in Belize City. (Photo by Island Boats)

BELOW: One of several luxury charter yachts built by Skipperliner in 2003. This 80-ft. vessel is designed for smaller markets and can hold 149 passengers for excursion and cocktail service and 65 for seated meal functions. (Photo By Skipperliner)

weather warms, returning to New Orleans near the end of the year.

Perhaps responding to competition from the New Orleans-based cruise lines, the American Queen will adopt three and four day roundtrip Mississippi River cruises from New Orleans on a year around basis in 2004, leaving the other river systems to the other two vessels. Bottom line; don't look for any U.S. flagged overnight riverboats to be delivered in 2004.

Dinner Boats

Other segments of passenger vessel industry are doing well, based on recent comments by leading naval architects. **Andy Lebet**, VP of DeJong & Lebet, Jacksonville, Fla., says there is "lots of interest" in dinner boats, especially those serving the luxury, charter segment of the market.

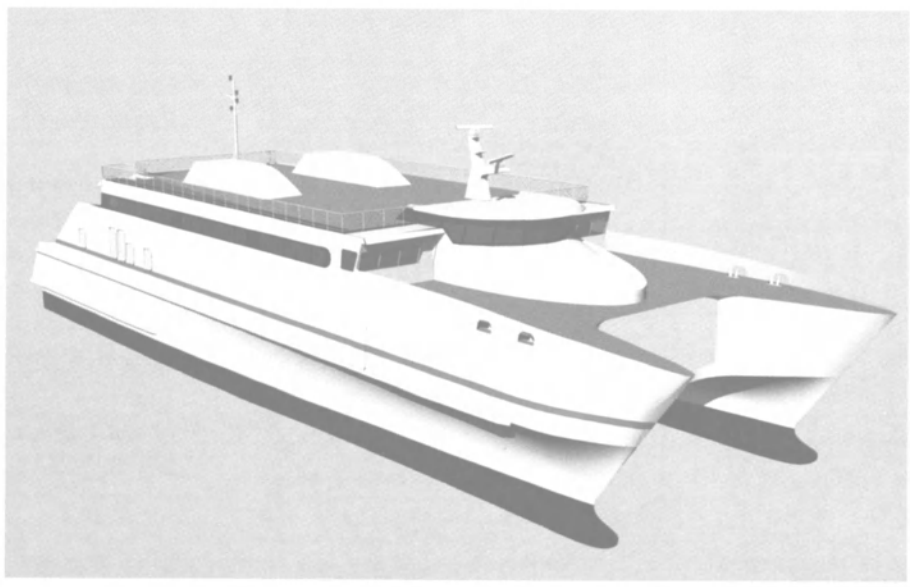
"We typically design and engineer three- to four vessels of this type yearly," Lebet said. Many of the passenger vessels his company designs are Subchapter K vessels, allowing for more passengers than the Subchapter T vessels, limited to 149 people plus crew.

Among the vessels engineered by DeJong & Lebet in 2003 include two luxury 400-passenger yachts, the Atlantica and the Majestic. "Both of these vessels work the charter trade, the Alantica in New York and the Majestic on the West Coast," Lebet reported. (A complete report on the Majestic is contained in the January issue of *MR's* sister publication Marine News.).

In 2004, the firm has more of the same kind of work including another 120-ft. by 33-ft. Sir Winston for Capt. Winston Knauss. Knauss typically builds a luxury dinner boat every two years or so and uses the latest ones in his own charter boat operation and sells the older ones. Keith Marine, Palatka, Fla., builds these vessels.

Freeport Shipbuilding, Freeport, Fla., builds a lot of the vessels DeJong & Lebet designs. At this time they are building a 120-ft. dinner boat for an undisclosed customer and they are also lengthening the 65-ft. Black Eyed Susan, a hydraulically powered paddlewheeler by 24 ft.

"The story on this vessel is a familiar one, Lebet said. "The owner needed a vessel capable of holding 149 people and he was turning down charters due to his passenger capacity constraints," Lebet



RIGHT: The first vessel to travel across Lake Michigan will begin service in May 2004. The Lake Express will carry 253 passengers and 43 vehicles across Lake Michigan at 34 knots. (Artists rendering by Austal USA)

The excursion boat Quicksilver was the first vessel launched from Island Boats' new facility on Bayou Teche. The 55-ft. vessel takes divers on reef tours in Hawaii. (Photo by Island Boats)

said.

Tim Graul Marine Design, Sturgeon Bay, Wisc. also reports "A great 2003 and 2004 looks good as well." Graul's signature project in 2003 was the ferryboat Arnie J. Richter, a "K" class icebreaking ferry that can transport 20 cars and 170 passengers to Washington Island, Wisc. from the mainland. The 104-ft. by 37-ft. vessel has 2,000 hp of propulsion power via a pair of Caterpillar 3508 engines. Built by Bay Shipbuilding, Sturgeon Bay, Wisc. the ferry was christened on Memorial Day, 2003 by its owner Washington Island Ferry Line.

Graul reports that the repowering of passenger vessels has been very active for him in 2003 with other projects in 2004. At the present time, Shepler's Ferry Line, Mackinaw City, Wisc. is repowering one of their 265-passenger ferries that run between Mackinaw City and Mackinac Island. "The vessel originally had three Detroit Diesel V12-71 engines developing 930 hp each," Graul said. "We redesigned the vessel for a pair of Detroit Diesel 16V 2000 at 1280 hp each," Graul added.

Owner Capt. Bill Shepler said the vessel was also lengthened by six ft. at the stern so the boat could carry more luggage and bikes. This is our second repower," said Shepler. "We did the same thing to a nearly identical vessel in 2003 and discovered we boosted speed from 30 to 35 mph and the extra six ft. made the vessel easier to handle in high seas," Shepler added.

Graul is also repowering a riverboat and designing a new 128-ft. ferry. Graul also does a lot of engineering work for Skipperliner, Lacrosse, Wisc. on their 149 passenger luxury yachts.

Skipperliner produces several luxury yacht-style charter dinner boats per year. "We are now building our vessels in a new 68,000 sq. ft. building that should increase our productivity," said Todd Jordan, marketing manager of Skipperliner.

Skipperliner is in the process of delivering three luxury yachts; the 149-passenger Ambassador and the 400-passenger Majestic to Pacific Avalon Yacht Charters, Newport Beach, Calif. And the 149-passenger Marco Island Princess to the upscale Marco Island Florida market.

Unlike the vessels for Pacific Avalon that is strictly a charter operation focusing on the wedding market, the 85-ft. by 20-ft. Marco Island Princess will run daily luncheon, cocktail and dinner cruises as well as private charters.

Even charter vessels can be built for speed. The Circle Line Statue of Liberty Ferry Inc. of New York City has taken delivery of the Zephyr, a 142-ft. by 37 ft. all aluminum charter vessel that can travel at 30 knots thanks to four Cummins KT-38's and four Hamilton waterjets. Speeds as low as 10 knots are used during sightseeing and meal functions by dropping off line two of the engines.

A relatively new shipyard shipyard burst on the scene in 2003. Island Boats that originally operated from a landlocked location near New Iberia, La., opened along Bayou Teche in Jeanerette, La. Before moving to their Bayou Teche location, the company had to truck their vessels to the Port of Iberia to launch them.

In the last two months, the company has delivered Quicksilver, a 55-ft. by 23-ft. vessel for divers to travel to reefs of the Hawaiian Islands at 26 knots. Propulsion power is via a pair of 600 hp Luggar diesels. Also delivered in this time frame has been a pair of 68-ft. by 22-ft. tenders for Royal Caribbean Cruise Lines. The vessels carry cruise ship passengers from the big ship to the island of Belize that has no port facilities deep enough to accommodate the RCCL cruise ships.

The vessels can carry 230 passengers per trip and were built to ABS standards, a requirement of all vessels in the RCCL fleet. Power is via a pair of Caterpillar 3406E engines that can propel the vessels to 25 knots.

From the Mouth of an Owner

From an operational standpoint, many excursion boat owners are still digging out from the ripples of 9/11. "Our business is steadily recovering," said Gordon Stevens, president of New Orleans Steamboat, that operates the 1,600 passenger, steam propelled paddlewheeler Natchez on harbor tours in New Orleans and the John James Audubon that offers trips between the Audubon Zoo and the Aquarium.

"Our success is tied closely to the overall New Orleans tourism and convention business. Fortunately both the city and state have very active marketing programs that have helped New Orleans recover its tourism base faster than many cities," Stevens added.

"Through both the state, city and our own efforts, we are trying to attract leisure travelers that may well drive to New Orleans as a destination," Stevens said. "Typically these visitors stay longer and have larger budgets than conventioneers," said Stevens.

Ferries

Ferries, both slow and fast, continued to exhibit growth in 2003 and more is expected in 2004. For the first time in decades, auto/passenger ferries will start appearing on the Great Lakes in 2004. On Lake Ontario, the Canadian American Transportation Systems (C.A.T.S.) will operate a 43-knot catamaran between Rochester, NY and Toronto, Ont. The 284-ft. by 78-ft. vessel will carry 774 passengers, 238 cars and 10 trucks. The ferry is being built by Austal Ships of Australia.

The U.S. subsidiary of Austal Ships, Austal USA, Mobile, Ala. is building a slightly smaller catamaran to operate on Lake Michigan between Muskegon, Mich to Milwaukee, Wisc. The Lake Express 58 is a 192-ft., 46-car, 253-passenger ferry that can operate at 34 knots. Propulsion power is via four MTU 16V 70 diesels driving Kamewa waterjets.

If these two vessels open successfully on the Great Lakes, expect to see more fast car/passenger ferries debut on other Great Lakes routes. There is talk of all truck ferries operating between Canada and Cleveland, Ohio and tapping the large number of casino patrons in the Cleveland area to a fast ferry that would travel to the casino at Windsor, Ontario.

The tremendous demand for ferryboats in the New York City area has subsided somewhat but vessels were delivered in 2003 including several small vessels for NY Water Taxi built by Derecktor Shipyards. Derecktor also launched in November a large passenger/auto fast ferry for service in Alaska. The Fairweather is the first of two such ferries that will carry 250 passengers and 35 cars at 32 knots. The Fairweather will be delivered in February 2004.

N.Y. Waterways serves the New York metro area with 45 ferries including two new ones supplied in 2003 by Allen Marine, Inc., Sitka, Alaska. The company now averages 65,000 riders a day.

Gladding Hearn, Somerset, Mass. has long been a builder of fast ferries. As an INCAT Designs licensee, the company has built more than two dozen fast ferries and delivered a 143 ft., 36.5 knot INCAT vessel to Hyannis Harbor Tours in 2003. On the books for 2004 is a 30-m, 30-knot, 149 passenger fast ferry for Mystic Ferry Leasing. Much of Gladding Hearn's 2004 production will be for pilot boats for a number of pilot associations.

In the steel-hulled "slow" ferry business, the year was highlighted by a pair of 180-ft. ferries built for the North Carolina Department of Transportation. Both vessels will serve the busy Outer Banks areas so popular with summer tourists.

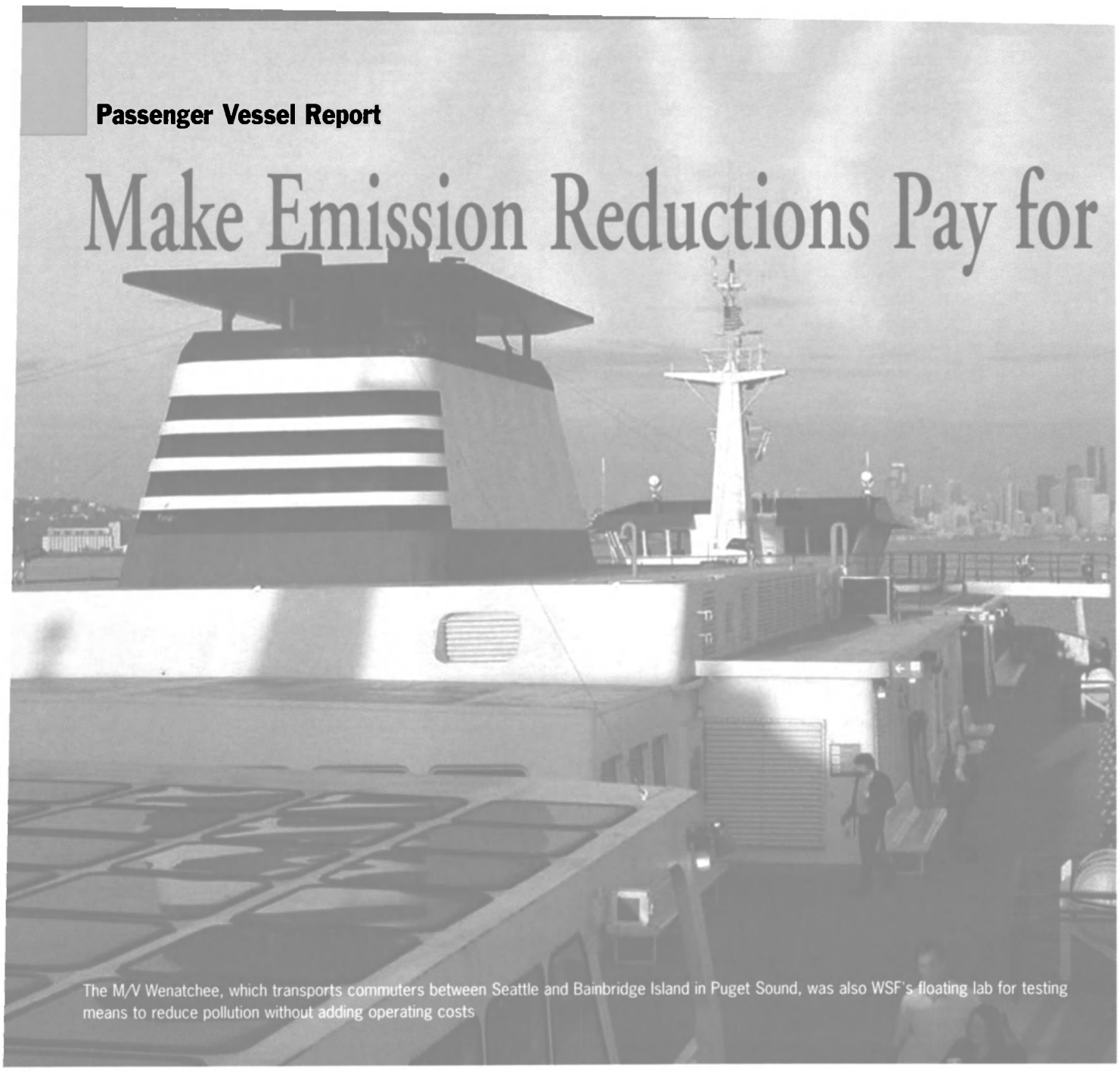
The fast ferry business, both passenger and the larger vessels capable of carrying both vehicles and passengers, will continue to grow in 2004 and beyond. The Great Lakes is a prime area for fast ferry development as well as areas along both coasts with high population density.

Security

The Maritime Security Act of 2002 requires all operators of commercial vessels with a passenger capacity greater than 150 to submit a vessel security plan to the Coast Guard by December 31, 2003 and be prepared to implement the plan by June 30, 2004. Knowing the burden this planning process would put on its members, the Passenger Vessel Association developed such a plan. PVA members had only to write a letter to the Coast Guard by December 31, 2003 stating they are using the PVA plan. PVA members in good standing will have until June 30, 2004 to complete and implement their security plan.

This Act also has a very controversial part requiring the installation of Automated Information Systems (AIS) on all ferries carrying more than 50 passengers and all commercial vessels over 65 ft. in length that are traveling in a vessel traffic system area. These systems are considered costly by some owners ... perhaps $10,000 or more per vessel. Also, its seems some operators view these requirements as burdensome and not adding any real security to the vessels or their passengers. Final details on the technology of the AIS system and its final implementation has yet to be ruled on.

Make Emission Reductions Pay for Themselves



The M/V Wenatchee, which transports commuters between Seattle and Bainbridge Island in Puget Sound, was also WSF's floating lab for testing means to reduce pollution without adding operating costs

By Clark Dodge, Staff Chief Engineer
M/V Wenatchee,
Washington State Ferries

One of our major goals at Washington State Ferries over the last several years has been achieving voluntary compliance with MARPOL 2000, a set of stringent international standards to reduce marine pollution. Part of this effort includes making our diesel engines more efficient. There is technology to accomplish this task, but since we are a state agency with a fixed budget, the cost of this effort has to be offset by finding savings somewhere else.

Even for something as desirable as pollution control, raising our operating cost was not an option. Our customers are mostly daily commuters who depend on the State of Washington for reliable, low-cost transportation.

Fortunately, for the performance trial described below, we selected a technology that has its own element of payback. To further offset our costs, we experimented with a more creative approach to making our crossings, arrivals and departures. Together, these steps enabled us to reduce our fuel costs and lower our emissions at the same time.

Ours is a state agency which operates 29 deepwater ferries transporting 26 million people every year between Seattle, the Olympic Peninsula and several islands in Puget Sound. In a typical year, we use 18 million gallons of diesel fuel, so maintaining tight control on our fuel usage has a significant impact on our operating budget.

The marine industry, especially our segment of it, has always had a big incentive for using cleaner burning, more efficient diesel engines. On open water there is no place to hide if you are a polluter. Your passengers, passing boats and people living or working near the harbors all take note when they see black smoke, particularly true in environmentally sensitive Seattle.

The Wenatchee Test

The approach mentioned above came from a two-year study we did on the M/V Wenatchee, a 470-ft. passenger ferry which plies an eight mile route between Seattle and Bainbridge Island in Puget Sound. Before the trial, the vessel was equipped with a Flo-Scan advanced fuel metering system. In the next phase, we changed our engine

ABOVE: Making a run back to Seattle at 19.7 knots, no smoke emissions are visible on the M/V Wenatchee after installation of state-of-the-art injectors on its four 4,000 hp diesel engines.

RIGHT: Key to the program was the installation of the latest fuel injector technology, specifically ECOTIP Superstack injectors capable of reducing emissions and lowering fuel consumption at the same time.

lubricating oil to Chevron 477 20-40 multi-grade. Then we added the technology.

State-of-the-art Interstate Diesel ECOTIP Superstack fuel injectors were installed on the ship's four 4,000 hp, 16-710-G7 diesel engines. GM Electro-Motive, builder of the engines, now makes these injectors available as original equipment on PMI diesel engines, the result of an agreement between the two companies. The injectors incorporate a number of design innovations that effectively lower emissions and improve fuel economy.

To somewhat offset our investment, we slowed down the drive motors slightly, but only on crossings that would not inconvenience our passengers. We reduced the vessel's cruise speed from the usual 180 shaft revolutions per minute (SRPM) to 140 SRPM on non-commute runs. We also slowed landings and departures using specific acceleration and deceleration points. The impact on the vessel's schedule was minimal. Speed was reduced by between one and three knots, but only one to three minutes were added to the crossing time, a factor that can be easily absorbed on this route during off-peak periods. Normal cruise speed is between 18.5 and 19.1 knots.

The impact of these moves on fuel consumption was dramatic. The ECOTIP Superstack injectors have shown in applications by other users that they can produce fuel savings between three and five percent while eliminating visible smoke and cutting down other emissions. By combining them with slower running on the Seattle to Bainbridge island route under the conditions mentioned, we can reduce fuel consumption by as much as 33 percent. That could be as high as 150 gallons an hour, or up to 3,000 gallons a day by our calculations. Projecting these figures, we can potentially save up to $1 million per year.

The ship's officers attested that no visible smoke was seen on either the fast or slow runs. There was no actual comparison between stack emissions before and after we installed them. However, Valley Detroit Diesel-Allison, a Mira Loma, Calif.-based agent of Interstate Diesel that assisted in the sea trials, took readings after the installation which showed grams per hour emissions almost matched the factory specs for a brand new 4,000 hp GM Electro-Motive 16-710 engines, and excellent result considering some of the Wenatchee engines have 30,000 hours on them.

How much changing the engine lube oil to multi grade contributed to lowered emission and improved fuel economy is unknown, but we feel it made a positive visual impact. However, it is known that it reduced oil consumption, cleaned up the engines, reduced valve guide wear, and, in essence, extended the life of the engines.

The Fleet

Lessons learned from this trail will we adopted fleet wide. The fleet of 29 vessels varies greatly in size, route and age, necessitating a different strategy be used to achieve goals. Engines from different manufacturers, blended fuels and low sulfur fuels are also being tested. Fuel injectors, which meter fuel going into the cylinder and turn it into a fine sprat that burns instantaneously on ignition, are playing a key role in the modernization effort. The ECOTIP injectors have several features that have proven effective in helping to reduce particulate matter, hydrocarbon emission, carbon monoxide and sulfur. For example, there is a smaller "sac" area in the tip, a patented feature that reduces the area where unburned fuel can accumulate and help lessen the dribble that can occur after the end of ignition, helping to promote a more complete burn with each ignition. The new injectors also have an improved check valve (patented), a reconfigured follower (patented), and a plunger that is match ground within clearance tolerances of millionths of an inch when inserted into its bushing. Marine operators have big incentives to try latest developments in fuel injectors, as an injector failure means the loss of an engine, vessel downtime and passenger inconvenience. That's why our injectors are usually inspected or pop tested from 5,000 hours on up, and completely replaced at about 9,000 hours.

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U.S. Navy

U.S. Navy's AEGIS Cruiser Modernization Program:

Adding Combat Power; Extending Ship Life

The guided missile cruiser USS Antietam (CG 54) approaches the port side of the guided missile frigate USS Ingraham (FFG 61) during a leap frog training exercise. The exercise allows ship handlers to practice the approach and stabilization alongside and a breakaway in a simulated underway replenishment environment. Ingraham and Antietam are part of the USS Carl Vinson (CVN 70) Carrier Strike Group on deployment in the Western Pacific Ocean. U.S. Navy photo by Photographer's Mate 2nd Class Jeremie Kerns.

By Edward H. Lundquist

The U.S. Navy's "Cruiser Modernization" program will extend the service life and enhance the combat capability of 22 of the Navy's 27 multi-mission AEGIS cruisers (CG-52 through CG-73).

The Cruiser Modernization is necessary to enable the CG-47 class to participate effectively in support of joint littoral campaigns. Missions include land attack, littoral undersea warfare, force protection, and anti-air defense, as well as allowing for a possible future Ballistic Missile Defense (BMD) mission. The program extends the service life of each ship to 35 years. Combat systems will be upgraded while crew size and maintenance requirements will be reduced.

The program ensures the availability of air defense cruisers to support fleet operations until the new CG (X) cruiser joins the fleet in 2018.

The effort will significantly improve these ships' air dominance, force protection, surface fires support and littoral undersea warfare capabilities. "We protect the force. We provide assured access anywhere, anytime. And we project power over land," said Rear Adm. Harry Ulrich, the Director of Surface Warfare. "To do this, we must focus on readiness, recapitalization and revolutionary systems."

"The various upgrades to the cruisers will ensure increased combat power throughout their service lives. Our analysis was modeled to pace the threat through 2025," said Cmdr. **Dave Matawitz**, branch head for Current Ships in the Navy's Surface Warfare directorate.

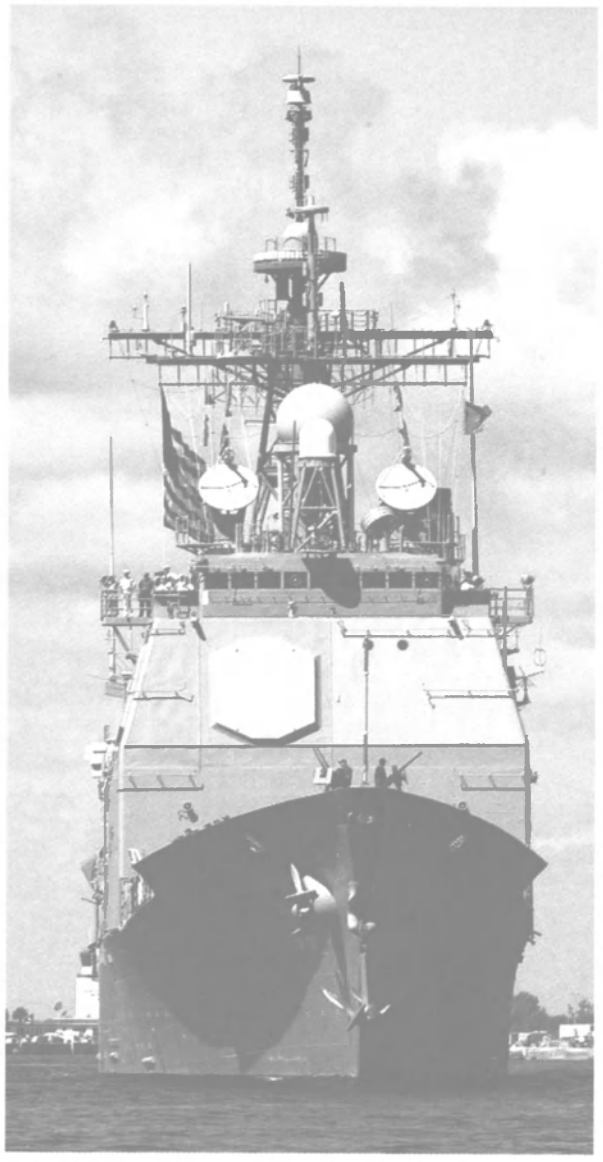
Cruiser modernization will provide both a computing technology and force structure bridge to future ships, Matawitz said.

The first ship scheduled to undergo cruiser modernization is USS Cape St. George (CG-71), with the work commencing in FY 06. The final ship will begin modernization in FY 14.

The first five ships in the class, known as Baseline 1, did not receive the vertical launch system upgrade and will not receive the modernization. The lead ship of the class, USS Ticonderoga, is now 20 years old, and will be decommissioned next year. USS Thomas S. Gates (CG-51) was commissioned in 1987 and will be retired in FY 06.

The remaining baseline 2, 3 and 4 cruisers have varying capabilities. The cruiser modernization program will result in all remaining 22 ships having a common warfighting baseline.

The combat systems included in Cruiser Modernization program involve weapons, combat direction and information processing systems. The ships will receive the AEGIS Baseline 7 Phase 1C computer program and Q-70 consoles with enhanced radar and computer displays.



The guided missile cruiser USS Philippine Sea (CG 58) departs from its homeport of Mayport, Fla. for a week long work up before her upcoming six-month deployment as part of the USS Enterprise (CVN 65) Carrier Strike Group. U.S. Navy photo by Photographer's Mate 2nd Class Aaron Peterson.

The Vertical Launch System (VLS) design modifications will support current and future missile capabilities including SM-2 variants, Evolved Sea Sparrow (ESSM) for improved capability against low altitude supersonic Anti-Ship Cruise Missiles (ASCM), Vertical launch ASROC (VLA), and Tomahawk variants.

A major component of the Cruiser Modernization program is the Mark 34 Gun Weapons System (GWS), which incorporates the Mark 160 Mod 11 Gun Computer System (GCS) and the 5"/62 gun with Extended Range Guided Munition (ERGM) capability. With the new gun, these cruisers will possess a long-range land-attack capability. The rocket assisted ERGM rounds can reach targets up to 60 nautical miles away with precision accuracy.

Other systems include the SPQ-9B radar; CIWS Block IB, SQQ-89A(V)15 sonar suite (Baselines 3 and 4 only) for enhanced littoral water performance, Cooperative Engagement Capability (CEC); and the Shipboard Advanced Radar Target ID System (SARTIS). These modifications will enhance the ship's relevance in the areas of air dominance, land attack, and anti-submarine warfare and will improve force protection in the littoral warfare mission.

Cruiser Modernization includes SmartShip enhancements including the Wireless Internal Communications System (WICS), the Integrated Bridge System (IBS)

The guided missile cruiser USS Philippine Sea (CG 58) departs from its homeport of Mayport, Fla. to start work ups before her upcoming six-month deployment.

The guided missile cruiser USS Princeton (CG 59) is deployed conducting combat missions in support of Operation Iraqi Freedom. U.S. Navy photo by Photographer's Mate 2nd Class Michael J. Pusnik, Jr.

for automated piloting, the fiber optic Ship Wide Local Area Network (SWAN), as well as the Integrated Condition Assessment System (ICAS) for automated recording of maintenance data relating to the main propulsion, electric and auxiliary equipment. Also included will be the Damage Control Quarters (DCQ) for real-time damage control information throughout the ship, the Fuel Control System (FCS) for automated control of the ship's fuel fill and transfer, and the Machinery Control System (MCS) to automate the main propulsion and electrical plant control.

"This program will allow us to work smarter and to incorporate advances in systems technology as well as to reduce future manning requirements," Matawitz said.

Cruiser Modernization will enhance the operational survivability of the class and will decrease maintenance costs by incorporating a number of HM&E ship alterations and type commander proposals. The "all electric modification" will eliminate waste heat boilers and associated equipment; replace steam-operated equipment with electric equipment including laundry washers and dryers, galley kettles, dishwashers, lubrication and fuel oil heaters and potable water heaters with equivalent electrical equipment; and replace flash type distilling plants with reverse osmosis units capable of treating potable water. The reverse osmosis units are easier to maintain, more reliable, and do not create high temperatures in the work spaces which reduces heat stress and improves shipboard quality of life.

"There will be significant weight reduction to improve ship stability and to enable growth for the ships additional service life," said Lt. Cmdr. **Eric Weilenman**, a requirements officer in the Current Ships branch. "Hull and deckhouse strengthening modifications will address emerging problems associated with cracks caused by metal fatigue."

In all, the Cruiser Modernization program is critical to sustain surface combatant force structure and will provide a cost effective bridge to the introduction of our future family of ships - including CG(X) in 2018. Modernization of the 22 ships will be completed by the year 2015.

A key component in the codernization effort will be the adoption of "commercial-off-the-shelf" computer systems. "The introduction of a COTS based computing environment, moving away from baseline legacy systems and toward Open Architecture," Matawitz said.

Cruiser codernization is necessary to maintain force structure until such time as the CG(X) is introduced. Navy policy currently sets the effective service life (ESL) of cruisers at 35 years for force structure planning purposes and ship design specifications. In actuality, the historical service life (HSL) of cruisers has been less as threat advances in technology while the ship's warfighting capability and hull, mechanical and electrical (HM&E) systems degrade. Consequently, the cost to operate and maintain the ship increases as its ability to meet the future threat decreases.

"The decision to extend or accelerate the decommissioning of a ship class is thus based on the affordability of the platform in relation to the warfighting capabilities that platform brings to the fleet," Weilenman said. Without cruiser codernization, the Navy would likely be forced to decommission the class before it could introduce sufficient numbers of new ships to meet the developing threat.

Navy's future fleet of surface combatants will be a family of ships that will include the multi-mission DD(X) destroyer and the follow-on CG(X) cruiser, as well as the focused-mission Littoral Combat Ship (LCS). The Navy's Arleigh Burke-class (DDG-51) AEGIS guided-missile destroyers will also be undergoing a mid-life upgrade and are also a vital part of this future fleet. "Cruiser codernization will extend the life of the remaining cruisers well into the 21st century, and provide the capability bridge to our future family of surface combatants," said Captain Ray Spicer, director of surface ships for the Surface Warfare branch of the Navy Staff.

Lundquist is Communications Director, Center for Security Strategies and Operations, Anteon Corporation. He is a retired U.S. Navy captain.

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HiPAP 500 for Single Anchor Loading System

Tuscan Energy has awarded Kongsberg Maritime a contract to supply and install a HiPAP 500 system on board the Nomis Shipping vessel, MV Dea Commander. The vessel will operate on the Ardmore Field in conjunction with two Single Anchor Loading (SAL) systems. These will be used to transfer oil to shuttle tankers using a flexible seabed riser. This loading system comprises an anchor point on the seabed where the loading risers and mooring lines are terminated into interconnected swivel systems. The Dea Commander will be responsible for orientating the subsea loading riser prior to connection to the tanker. It used the HiPAP system with subsea gyro transponders mounted on the swivel point. Once connected, the tanker is able to weather vane freely during loading, and the Dea Commander monitors the correct orientation of the flexible seabed riser during the whole operation.

Circle 20 on Reader Service Card

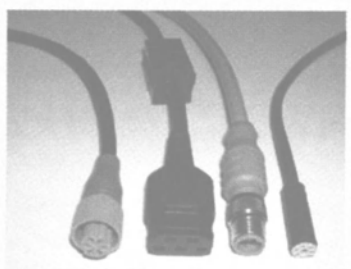
VT Halmatic Completes Massive Yacht Mast

VT Halmatic completed production of the world's tallest yacht mast, which will be fitted on the Mirabella V under construction by parent company VT Shipbuilding. The 90 m hollow carbon epoxy mast, which has a maximum cross section of 1.6 m and structural thickness of up to 40mm, will support some 3,400 sq. m. of sail. Having been loaded onto a barge at VT Halmatic's Portchester shipyard, the mast was transported to Southampton Docks where the rigging will be dressed and the mast will be stepped before fitting out is completed. The mast has been manufactured in halves, with the back half comprising two sections and the front half divided into three sections.

The manufacturing process, a similar method to that used in the production of Grand Prix racing cars and the aerospace industry, consists of layers of carbon reinforcement pre impregnated with epoxy resin. A vacuum bag is used to consolidate the carbon every few layers.

Carbon compression tubes were prefitted to coincide with the position of each spreader. Some five tons of cabling have been fitted within the hollow center of the mast, including a mass of sensors to monitor the sail performance. Structural expertise was provided by Hamble-based High Modulus, who are involved in composite engineering aspects for the total Mirabella project.

Simrad Unveils SimNet



Simrad unveiled its new data sharing and control network, SimNet, recently. This high-speed, high-capacity network facilitates the full connection of Simrad products, allowing for such features as the display of dVHF messages on navigation consoles.

Simrad SimNet plug and play integration system is designed for ease of installation and interface between plotters, radar, autopilots, VHF radios and other instruments. It's size makes installation of onboard networks easy - 10mm holes are all that are required to feed the cable through bulkheads and walls and deck. This has been achieved by downsizing the plugs themselves. SimNet provides NMEA 2000 compatibility, enabling connection to other systems such as engine monitoring. Using an active interface SimNet is also able to connect to existing equipment using NMEA 0183.

Circle 3 on Reader Service Card

"... It is calculated that an additional 986 vessels up to 1,500-TEU will be sought"

Will there be a Feeder Frenzy?

By David Tinsley

A study commissioned by Lloyd's Register and conducted by Ocean Shipping Consultants has determined that major investment will be required in feeder and shortsea containerships through to the end of the decade, in support of surging development in the trade and in the size of the deepsea mainline vessels. Over 25 percent of today's worldwide boxship fleet, and nearly 60 percent of the present orderbook, is in the post-Panamax category, and it appears ever more likely that the industry will see the first 12,500-TEU vessels before 2011. "The demand for big ships will clearly lead to higher demand for transhipment," said **David Tozer**, Lloyd's Register's Business Manager, Container Ships. "The increase in demand for shortsea shipping, as well as the increasing age of the current feeder fleet will further contribute to the need for new feeder vessels. The projected tonnage shortfall in this size range represents a major opportunity for shipyards and shipping lines," he considered. On the basis of a forecast, staggering 69-percent rise in intra-regional and feeder container shipping volume from 58-million TEU in 2002 to some 99-million TEU by 2010, it is calculated that an additional 986 vessels up to 1,500-TEU will be sought. In addition, on the assumption that many of the ships currently more than 15 years old may go for scrap by the end of the decade, there would be a replacement need for 585 vessels. Accordingly, LR and OCS contend that the net newbuild requirement within the given timeframe will be for 1,571 ships under 1,500-TEU. Were the tonnage build-up to be achieved on a linear basis, this would necessitate new deliveries at a rate of over 200 ships in each of the seven years between 2004 and 2010 inclusive. However, LR acknowledges that the figure is likely to be somewhat reduced by a trend towards higher unit capacities within the under-1,500-TEU field, and also by the deployment of vessels over 1,500-TEU as longer-haul feeders. A realistic estimate therefore puts the number of completions required annually at some 170-180 vessels.

Pragmatic 'green' thinking

As a possible template for well-reasoned and effective charging on the basis of the impact of a ship's exhaust emissions on the atmosphere, Sweden's environmentally-differentiated fairway dues system has much to commend it. Indicative of the Nordic countries' pragmatic approach to environmental matters, the arrangements put in place by the Swedish Maritime Administration at the beginning of 1998 introduced a form of charging which gave greater economic incentive to 'greener' vessels, by imposing increased dues on those producing the highest noxious emissions. Now, six years along the way, the system is adjudged to have had significant effect, in helping to induce substantial decreases in the amounts of Nox (oxides of nitrogen) and Sox (oxides of sulphur) emanating from shipping activity. According to **Per Ekberg**, Administration's Manager for Maritime Policy and Public Affairs, the overall reduction achieved in the Baltic Sea and North Sea areas is estimated to have been 50,000-tons for SOx and around 30,000-tons for NOx on an annual basis. The differentiated tariff, plus the now ceased reimbursement scheme for shipboard equipment such as catalytic converters, has also benefited the development and use of NOx abatement techniques.

Now the Swedish authorities are reviewing the system, to investigate how it could become more aligned to the principles of social marginal cost pricing and existing European Union regulations. A further aim of the review is to probe how still stronger incentives for environmentally friendly maritime transport could be introduced into an efficient charging system. The Swedish differentiated dues initiative of 1998, which involves about 25 of the country's ports, has to be seen against a backcloth of not just cultural ethos but fundamental scientific considerations. The Scandinavian ecosystem is highly sensitive to acid rain and acid deposition, and the lack of buffering capacity for acid rain in its soil remains a point of concern for Sweden. At the

time the system was brought into being, it was estimated that more than 10-percent of sulphur deposition in Sweden, as in Denmark, the Netherlands and Norway, stemmed from sea transport. Ships were also considered to contribute between 10 and 20-percent of oxidized nitrogen deposition in Sweden.

Vision FT IBS Launched

With a fair amount of secrecy Sperry Marine ushered customers and interested parties into and out of a private room on its stand at Europort 2003, offering a glimpse of what it hopes will become the standard for integrated bridge systems. Dubbed Vision FT, the unit — the third generation of the company's console bride layout — is impressive with its breadth of integration of current standards, as well as its flexibility for future growth. The Vision FT integrated bridge system (IBS) incorporates the latest advances in marine navigation technology and combines all of the ship's navigation sensors and systems — including radars, electronic chart display and information system, gyrocompass, depth sounder, speed log, DGPS receivers and autopilot — into a completely integrated package.

Central to the system is Sperry Marine's Voyage Management System (VMS) software, which is designed to provide easy and precise route planning and gives a clear real-time picture of the ship's precise position and movement, along with radar targets and automatic identification system data, on an electronic chart display and information system.

"In the future, I believe the main navigation display will be an electronic chart with a Radar and AIS overlay," said **Capt. Jan T. Hansen**, the company's director of system sales worldwide. This reality is dependent, however, on the availability of electronic chart data.

The Pocket Bridge

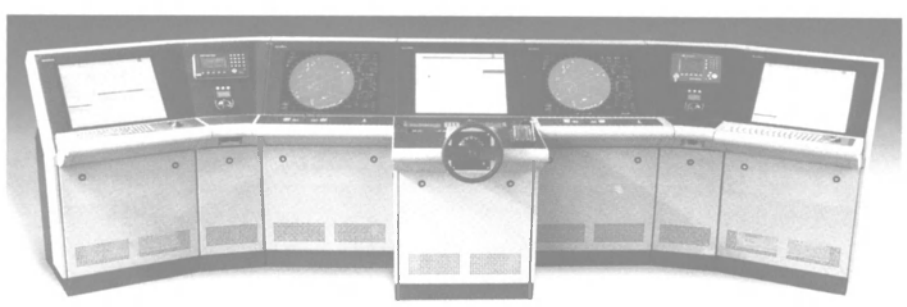
While Vision FT, like all other IBS systems, must adhere to standards laid down by international authorities, there are many notable improvements designed to appeal to safety and efficiency minded ship operators.

The new bridge console designs have been optimized for modern large-screen high-resolution flat-panel color displays, with easy front-panel access for maintenance and repairs, said Frank Soccoli, director of marketing for Sperry Marine. The man-machine interface has been upgraded with a new ergonomic trackball control device and drop-down menu windows for easy operation minimizing the need for operator training.

Another interesting offering is the PocketBridge, a remote wireless multifunction handheld device that is designed to allow for the ship's master and officers to view data from the IBS and other ship systems on a palm-type computer anywhere on the ship.

Another new capability is NaviVision, an aircraft-style "heads-up" display that projects vital ship navigation data directly onto the bridge windows.

Circle 1 on Reader Service Card



The Art of Maneuvering

Cunard's 30-knot cruise liner Queen Mary 2 is testament both to the business verve and the technological resourcefulness of the maritime industries. The circumspect approach to every facet of the project underscores the preoccupation with issues of long-term structural integrity, safety, and operational dependability and quality, as the essential backdrop to efficient and expansive revenue-earning over many future decades' service on the open ocean. Many examples of the shipowner's endorsement of pioneering technologies can be found in the 150,000-gt newcomer to the North Atlantic. Besides the by now well documented design, constructional and engineering advances encapsulated in the vessel, the Cunarder is also claimed to provide the first reference for an onboard PC-based maneuvering simulator directly linked to the ship's dynamic positioning system. As the first vessel fitted with a quadruple pod arrangement, particular importance was attached to ensuring officer familiarization with the ship's maneuvering characteristics, handling performance and onboard equipment. Cunard Line therefore contracted BMT SeaTech, a subsidiary of consultancy British Maritime Technology (BMT), to supply its enhanced PC Rembrandt simulator system to the QM2. In collaboration with Alstom, BMT SeaTech had earlier successfully linked PC Rembrandt to Alstom's A-series DP system. The end result is a DP simulator combining the specific DP algorithms and console from Alstom with the PC Rembrandt mathematical model and worldwide electronic charting and 3-D visuals. The system has initially been used at the St Nazaire yard of Chantiers de l'Atlantique, builder of the QM2, prior to bridge installation. It permits use in 'stand-alone' mode by the bridge personnel, employing the individual thrusters and pod controls, or with the Alstom DP system, to provide high quality training and familiarization in ship handling, maneuvering and DP operation. According to Giles Heimann, Cunard's Manager-Training, Recruitment and Personnel, "The combined capability of linking the DP hardware to BMT SeaTech's PC Rembrandt simulator has worked very well." He added that "The ability to conduct the training exercises in QM2's ports of call proved to be a significant advantage, and PC Rembrandt has therefore provided an ideal platform for such forms of training and familiarization."

GE M&SP Makes Strong Maritime Push

By Greg Trauthwein

GE Transportation Systems, Marine & Stationary Power (M&SP), is making a strong push to capture medium-speed diesel engine business in the maritime sector, fortifying an international network of service centers and bringing its product to center stage at many of the Autumn 2003 trade exhibition.

GE Transportation Systems has is the market leader in the locomotive business, with 85 percent of its annual production targeted to this business. While marine business has not accounted for a large percent of its overall business to date, its medium-speed diesel engine capability is considerable. In the rail business, no one looks at the engine for 90 days, whereas in the marine and stationary sectors, the engines are pampered, said **Tina Donikowski**, General Manager Propulsion & Specialty Services.

According to **John Manison**, manager of GE Marine & Stationary Power, marine operators have traditionally enjoyed good success with the engines in vessel applications, but the company did not build or support an adequate service side to meet the unique demands of the international marine business. All that changed this year, as the company added 25 service centers worldwide in 2003 alone, with plans to expand similarly in 2004, with estimates of 60 to 70 total by year's end.

The Engines

GE Marine & Stationary Power (M&SP) now offers enhanced emissions and engine technology for its complete line of GE medium speed and GE competitive diesel engine products, meeting MARPOL and EPA Marine Tier 1 compliance guidelines.

What follows is an overview of the emissions solutions for GE's 8, 12 and 16 cylinder engines as well as the EMD engines. GE's 7FDM engine model, 8, 12 and 16 cylinder engines are in the power ranges of 1,600 bhp/1,193 kW to 4,500 bhp/3,355 kW. The high compression, Electronic Fuel Injected (EFI) engines recently received ABS certification. In addition, they meet current MARPOL and EPA Marine Tier 1 emissions requirements, with NOx below 8.6 g/hp-hr.

According to Manison, "A big advantage for our customers is, that since these engines will meet EPA Marine Tier II compliance which goes into effect in 2007, there are no concerns now regarding future emissions requirements."

A recent example of a project that uses GE's new EFI engines is with Washington State Ferries. Each ferry used two GE diesel engines that had been operating for over 23 years. To date, GE has repowered four vessels, each with two, new 12-cylinder EFI GE Diesel engines. Two additional ferries will be repowered by mid-2004.

GE has also developed emissions kit for the EMD 645 E7B, E7C and F7B turbocharged 12, 16 and 20 cylinder engines. By employing these kits, a 2 percent improvement in fuel consumption for the 12 cylinder EMD engine can be realized, and no fuel loss occurs with the 16 and 20 cylinder engines.

"No other company we know of offers the same advantage as GE for these EMD engines, because with our emissions technology there is no impact on fuel consumption, reliability, maintainability and serviceability of these EMD engines," noted Manison.

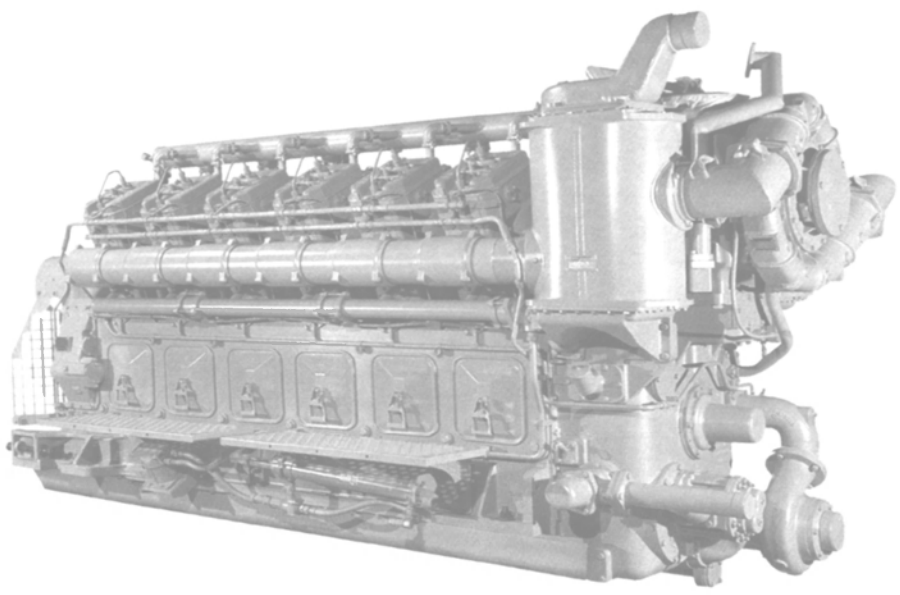
In addition, when upgraded with GE's emissions kits, these engines can meet MARPOL and EPA MARPOL Tier 1 emissions compliance guidelines, with NOx below 8.6 g/hp-hr.

Through a GE M&SP service center, two EMD 645 engines used by Port Jefferson ferry in the metropolitan New York area were brought into MARPOL compliance using GE's emissions kits as part of a new vessel build. The EMD engines had been operating for 10 years on another vessel. The rebuilt engines were brought into MARPOL compliance with GE's EMD emissions kits, offering the customer no increase in fuel consumption.

American Commercial Barge Line LLC (ACBL) will install the kits on two EMD 16-cylinder 645 E7B 3,100 hp engines used to power the M/V Judi. This 6,200-hp, lower Mississippi river vessel will be the first inland waterway vessel to employ the new GE emission kits.

ACBL has plans to outfit the balance of the EMD fleet with GE MARPOL/EPA Marine Tier 1 emission kits.

Alter Barge will use the emissions kits on two 12-cylinder EMD* engines aboard the MV Phyllis.



A 12 cylinder GE Diesel engine. GE's 7FDM engine model, 8, 12 and 16 cylinder engines are in the power ranges of 1,600 bhp/1,193 kW to 4,500 bhp/3,355 kW. The high compression, Electronic Fuel Injected (EFI) engines recently received ABS certification. In addition, they meet current MARPOL and EPA Marine Tier 1 emissions requirements, with NOx below 8.6 grams per horsepower-hour.

International Presence

GE marine presence expands well beyond the U.S. borders, as it signed a major deal on stand at the recent Europort 2003 exhibition in Amsterdam. Rensen Shipbuilding, KB-RCD and General Electric Transportation Systems signed a Letter of Intent for the supply of a GE V8 propulsion engine, for a new chemical tanker being built for Friendship Tankvaart B.V. Funding for this project, estimated to be worth almost $5 million, will be made available through GE.

The Rensen Group is specialized in building inland vessels and has delivered more than 200 new ships in the past 20 years. The company is run by **George Rensen**, one of a few certified brokers in the world of inland shipping. He has developed his own concept of building hulls abroad, with most building yards are in Romania (shipyard Orsova). The Rensen Group is agent for this shipyard and Mr. Rensen also represents shipyards in Russia, Poland, Czech Republic and China.

The chosen engine for this project is a GE V8 EFI high compression engine with an operating speed of 1,000 rpm and 1345 kW. GE diesels utilize the new Powerstar controller, which is available with multiple customized protection options. The Powerstar controller houses the electronic governor unit, speed reference and load core and protects the engine against overspeed, overload, low oil and water pressure and positive crank pressure.

"This project is not only significant due to its commercial value but also its strategic importance," said **Jan Groeneveld**, European Sales Director for GE. "It is the first order for GE to power an inland vessel in Europe, adding to many years of experience in the U.S. market."

"GE plans on becoming a serious player in the inland shipping market with a range of engines highly suitable for the current generation of modern inland vessels," said Donikowski. "The engines are known to be long lasting and dependable with very low life cycle costs." The 3,800 cu. m. double hull chemical tanker will measure 110 x 11.40 x 5.60 m, and is due to be commissioned in 2004. The owner of the ship is Friendship Tankvaart B.V. Progress Shipping B.V, which is the parent company of Friendship Tankvaart B.V. has expressed the intention to place an order for an additional four ships.

Circle 37 on Reader Service Card

Company Profile:

Propeller Cutting Technology to Free Entangled Lines

Since 1982, equipment manufactured by Spurs Marine has been protecting propellers, shafts, seals and bearings from line entanglement. Spurs cutter technique is a two-part assembly, with one or more rotary cutting blades and one stationary cutter blade - attached to a propeller hub, rope guard and/or strut. The purpose of this mechanism is to engage lines or debris entangled by the propeller and instantly cut them free with each revolution of the propeller. Although the concept is simple, the technology involved is advanced in terms of design, materials and precision manufacturing, since the equipment must remain in operation for a long period of time. Years of research and testing have resulted in a patented system that has been proven both reliable and effective. Precision machined, heat treating, hardened stainless steel metals, high tech hydrophilic and bronze bearings and corrosion control engineering are integral features of Spurs cutter systems. Routine maintenance during regular scheduled drydocking is recommended. Under the U.S. Oil Pollution Act of 1990 (OPA 90), which imposes heavy penalties for oil leaks, the source of any leak as from a stern tube must be secured immediately. Spurs cutter systems help protect against pollution by guarding the running gear from oil seal damage and the use of Spurs, as an entanglement clearance system, will assist in the prevention of leaks before they can occur. Thousands of U.S. Navy and Coast Guard vessels, as well as tankers and other cargo ships operating worldwide, currently use Spurs cutter systems. Spurs use the propeller's rotation and inertial force to power the cutting action. As an offending line enters the propeller vortex, it is wound down toward the propeller hub. Without such equipment installed, it is at this point that the line would wrap itself tighter and tighter, entering into the space between propeller hub and rope guard, where oil seal damage occurs. Instead, the line is engaged by the rotary cutter blades and delivered to the stationary cutter blade. This sudden resistance, sensed by the stationary cutter, forces a cam action causing the blade to be pushed aft, meeting the rotating blade and severing the obstruction instantly.

The cutting force increases in direct proportion to the resistance sensed by the stationary cutter assembly. Hydrophilic and bronze surface bearings maintain precise cutter positioning when resistance occurs. With each revolution, the cutters pass each other gliding on a thin lubricating film of water within a few thousandths of each other, thus avoiding surface wear during long passages.

The typical large ship cutter is installed easily on vessels with oil seal bearings. With cutting blades that are comprised of stainless steel hardened to approximately 43-45 Rockwell C, this hardening characteristic ensures a high level of cutting ability. The resulting metal is reportedly the hardest metal known to remain stable in saltwater. The remainder of the cutter parts are 316L stainless. This grade of metal is suitable where hardness is not required for performance, however, it is also very stable in saltwater. The box welded into the rope guard is made from 316L stainless and is easily welded into the mild steel rope guard using stainless welding rod. Zinc anodes are also welded on the underside of the rope guard.

The typical cutter system from medium to very large vessels can be fitted with forward propeller hub diameters from 228 mm-1,825 mm. The stationary cutter assembly can be mounted directly onto a strut or into a rope guard. Cutter installation is quite versatile and can be adapted to almost any application. A new rope guard design is part and parcel of the overall cutter system design. Rope guards that are larger than the propeller hub and slope upward from the propeller hub guarantee line intrusion and must be redesigned.

Circle 9 on Reader Service Card

Q&A with Hapag-Lloyd Chief Superintendent Engineer Klaus Marek

Q: Does Hapag-Lloyd only operate shipping vessels?

Marek: Hapag-Lloyd today is a global logistics company that offers its customers the complete range of transportation options to help them better manage their supply chain activities. Our 40 state-of-the-art container ships primarily service the crucial East-West trade routes around the globe. These container ships dock regularly at the most-important ports of the world.

Q: Which shipyards do you prefer to contract?

Marek: As a rule, we advertise for bids internationally. Unfortunately, from our perspective, German shipyards are not competitive in our line of business. For the past 15 years we have been ordering ships exclusively from South Korean manufacturers. We started with Samsung, but then chose Hyundai to build our last eight ships. Hyundai also has the contract to build three ships we recently ordered. The vessels are slated for delivery in 2005 -2006.This shipbuilder offers exceptional quality at a good cost/benefit ratio.

Q: What specifications do you give shipbuilders?

Marek: Since our design specification booklets are about 500 pages, we have very specific requirements for our new ships. These include ways to optimize the distribution of containers according to their size; speed specifications; and last but not least, our environmental requirements. We expect the ship 's materials to have a 25-year service life. We also specify how we want the ship to be equipped -engine type, auxiliary machines and accessories. While much of the equipment is European-made, many European suppliers now license parts production to Korean manufacturers. MAN B&W Diesel in Copenhagen, Denmark, for example, will provide just the design for our ships' engines.

Q: How would you size up the immediate future of the shipping industry?

Marek: On average, worldwide container transport has grown by 6 percent annually. In recent years, Hapag-Lloyd has even posted double-digit growth rates. This surge is not expected to end anytime soon, as the globalization of trade continues to keep pace with the phenomenal growth trend in container shipping. There are many products that used to be transported conventionally in special ships that are now being delivered to the customer in standardized boxes. Another sign of the market 's growth is the sizes of the ships being built today. Four to five years ago, all our vessels could pass through the Panama Canal. Those ships are a maximum of 294 meters long, 32.8 meters wide and have a storage capacity of approximately 5000 containers. To meet the growing demands for transport services that I mentioned earlier, we had to order bigger ships. Our new Hamburg Class features four ocean giants. They are 320 meters long, 43 meters wide and offer a storage capacity of 7500 containers.

Q: Will ships become even bigger?

MAREK: We recently ordered three ships with storage capacities of up to 8000 containers. Whether ships will get even bigger than that is impossible to predict right now. Based on our current observations, if ships get even larger, something will have to be done to improve the current propulsion systems so that they will meet the minimum speed of 25 knots stipulated by Hapag-Lloyd. Also, one should not forget that ports around the world will need the appropriate equipment and an improved infrastructure to capably deal with the rapidly growing shipping volumes. In many ports, these issues are already a serious challenge.

Q: How does that impact the propulsion side?

Marek: The performance requirements rise to the third power not only with increasing speed but also with additional weight. Currently, we are satisfied with the nearly 68 000 kilowatts produced by the 98 engine from MAN B&W Diesel. If we remain with a single-shaft operation, we will need an engine with a 108-centimeter cylinder bore or 14-plus cylinders in ships with a storage capacity of 9000 to 10 000 containers. Ships that exceed even those capacities will need a double-shaft operation. One must also consider the possible size limitations of the propellers.

Q: What are your most important goals?

Marek: Hapag-Lloyd is intensely focused on staying innovative and successful in the business. We also aim to maintain the leadership role we play in the international shipping community when it comes to environmental protection. We consider this an important and significant responsibility.

Klaus Marek, 63, is Chief Superintendent Engineer at Hapag-Lloyd Container Line based in Hamburg, Germany. He is the company's Head Ship Inspector and top technician. Marek and his team oversee the construction of new ships as well as four ocean liners owned by subsidiary Hapag-Lloyd Cruises. A marine engineer, Marek did his engineering training at the Howaldtswerke shipyard in Kiel, Germany. He went to sea in 1959; in 1968 he was awarded his certificate in ship propulsion systems and became head engineer. After 28 years at sea, he moved to a desk position, at which time he assumed many of his current responsibilities.

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Titan 2 Refurb Delivers Unexpected Benefits

When Global Industries contacted Thrustmaster of Texas to help upgrade the Titan 2 heavy lift vessel for dynamic positioning (DP), the Louisiana-based company found more benefits than expected. Although not one of the original goals, a result of the conversion was a vessel that can maintain station for at least 30 minutes during a complete blackout.

With the self-reliant thrusters used in this upgrade, said **Keith Hebert**, DP group operations supervisor, the Titan 2 will not drift during a 30-minute blackout. The Titan 2 was self-propelled with two main Z-drives of 2,200 hp each, and two tunnel thrusters at 200 hp each. The Thrustmaster conversion added eight 1,000 hp hydraulic azimuthing thrusters and eight self contained Hydraulic Power Units (HPU's) to the heavy lift vessel. The conversion of the Titan 2 to a DNV class AUTR DP vessel began in mid 2001. Minimal modifications to the hull and existing shipboard systems reduced time to the February 2002 delivery. "We didn't have the added expense of dry docking and cutting into the hull to add the thrusters," Hebert said.

Since its delivery, the vessel has worked in the Bay of Campeche for Pemex, and in its first year of operation it logged over 6,000 hours with 100 percent availability.

The Bollinger Calcesieu Shipyard in Louisiana installed all of the DP equipment, Thrustmaster thrusters and deck-mounted Hydraulic Power Units. The shipyard also performed the hull modifications to accept the thrusters, which were mounted with minor structural support modifications to the hull. Each thruster unit has a dedicated diesel engine powered Hydraulic Power Unit for propulsion and azimuthing. Although the DP system is sometimes considered as just the computer, the entire vessel should be considered a system. Most DP systems rely on the vessel power plant for power to the thrusters, so anything connected to the power plant can affect the system.

The Conversion

Global Industries installed eight Thrustmaster Hydraulic Azimuthing units - six at the bow and two at the stern. The existing vessel controls were modified so the new DP system could control the original thrusters without affecting the original controls. Although the existing tunnel thrusters interface to the DP system, the company anticipates using them only in extreme environmental or job conditions.

Bollinger installed a Kongsberg-Simrad SDP21 and a Kongsberg Norcontrol Monitoring and Alarm System on the vessel. The DP system provides inputs for two survey-supplied DGPS inputs and the existing ship's gyro. The system also includes two 3 KVA uninterruptible power supply (UPS) units, which provide up to 30 min. of battery-supplied power to the DP hardware.

The shipyard installed the containerized HPU's on the main deck near the associated thruster units. The HPU units, supplied by Thrustmaster, were complete and only needed to be secured to the main deck. Running the hydraulics from the containers to the thrusters by hose instead of stainless pipe shortened the delivery time by several weeks and saved 80%. Although not one of the major design goals, one of the biggest benefits of each thruster having its own self-contained power unit was the fact that the vessel could continue to maintain station after a total blackout of the ship's electrical plant. Except needing pressure to fill the fuel tanks occasionally, the new thrusters do not require the main power plant to operate.

Station-keeping during a blackout is limited to a half-hour because that is the capacity of the DP system UPS units with the current load. Additional power could be supplied to the UPS batteries to extend station-keeping capability indefinitely during a blackout. The Thruster package design avoids the need for accurate rpm control or coordination between multiple engines. Individual diesels take care of individual thrusters. Controls are simplified compared to a bussed diesel-electrical power plant. A failure in a diesel engine or associated hydraulics cannot cause the loss of more than one thruster.

Circle 38 on Reader Service Card

Renold Couplings for AHTS Fleet

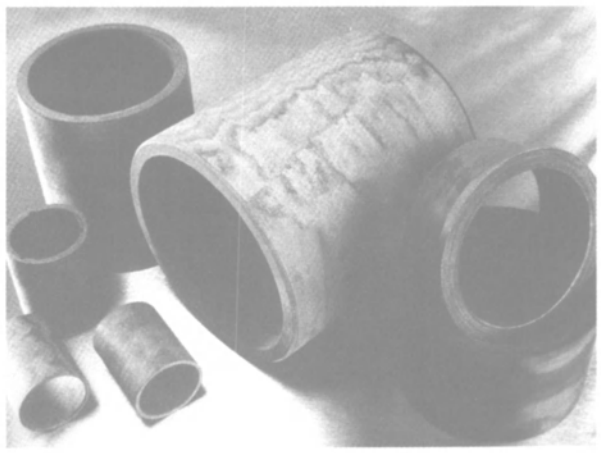
Renold Hi-Tec Couplings won a contract to supply DCB 838.0 rubber in compression shaft couplings for marine propulsion systems to be installed in a fleet of anchor handling/tug supply (AHTS) vessels. The first of the vessels, MV JP Laborde, is being built at the Yantai Raffles Shipyard in China for Tidewater Marine. Each of the vessels is 282-ft. long and dynamically positioned with a bollard pull in excess of 200 tons. They will have the ability to handle anchors in depths in excess of 5,000 ft.

Renold was awarded the contract by Karl Senner, Inc., who is responsible for supplying Reintjes DLG 4447U twin input/single output reduction gear for the five vessels. The DCB couplings are to be installed in the drive train between each of the Amerimex electric motors and reduction gearboxes,

which in turn drive the azimuth reversible thrusters, which provide the propulsion.

Circle 24 on Reader Service Card

Advanced Bearing for Sub Ops



Orkot TXMM bearings were chosen for use on a deep ocean submarine installation. The TXMM bearing reportedly exhibits negligible swell in water, therefore maintaining the correct installed operating clearances needed to retain dimensional stability and deliver a long wear life at submarine operating depths.

TXMM can be used for special spherical bearing applications and is maintenance free. It has approval for hatch cover slide pads operating dry at pressures up to 35N/mm2. It also has classification approvals from all major societies for totally dry operation, such as neck bearings for ship's rudders.

Circle 22 on Reader Service Card

Renk Gears for Fast Trimaran

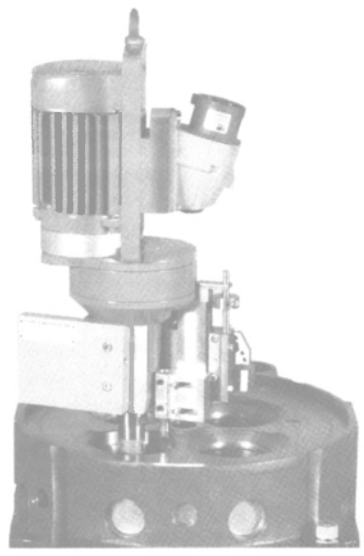
Renk won a contract on the main reduction gear for a new generation of fast ferry design, a 127-m long trimaran introduced by Austal for Fred Olson SA. The innovative ship is due to start operation in the Canarian Islands by the end of 2004, carrying 1,350 passengers and 340 cars at more than 40 knots.

A real innovative design applies to the center combining gear - Renk ASL 2 x 80 - which transmits the power supplied by two diesel engines (2 x 9,100 kW/1,150 rpm) to one large booster jet. For most operational flexibility, this is to be driven not only at continuous maximum power, but also in partial load with one diesel engine. For optimization, a second gear stage is introduced in form of a planetary gear on the output shaft arrangement, the operable from both diesel ends and avoiding separate gear stages.

Circle 26 on Reader Service Card

New Valve Seat and Recess Lathe type VRL

With the development of the VRL machine, the function of in-situ machining of valve seats and seat recesses of medium speed diesel engines has been accomplished. The VRL is adjustable for different machining diameters, and for machining seat recesses horizontally, vertically and for chamfering. It is electrically driven and a frequency converter enables step-less adjustment of the rotational speed of the machine from 0 - 290 rpm. The spindle for machining the recesses is made of two parts and thus divisible for easy access with a standard diameter measuring tool. For seat angle machining, the exchangeable adapter makes it a simple operation, and several preset seat angles can be set from our factory. Automatic centering with high accuracy makes the VRL easy to operate.



Circle 4 on Reader Service Card

Stern Tube Installation in Hours

Skandiaverken of Sweden has acquired the patented technology and production facilities for the SKV Flexi Tube. The SKV Flexi Tube is designed to allow a complete stern tube installation in hours, as it is designed to require less preparation work for designers and shipyards. Alignment is achieved by the SKV Flexi Tube being integrally cast in an epoxy resin using a specially designed and patented sealing package and a filling method that is designed to give complete filling sans air pockets. It shall not be welded to the ship structure since a patented axial flexibility of the forward boss allows thermal expansion while in operation.

In order to design a customized SKV Flexi Tube, the only information needed is type of hull, calculated stern tube length and diameter of propeller shaft.

Circle 25 on Reader Service Card

Marine Propulsion Directory

The following Marine Propulsion Directory is the result of a survey e-mailed in October/November 2003. If you would like your company listed in this directory, please forward details to mren@marinelink.com. Publisher not responsible for errors or omissions.

ABB Turbo Systems Ltd.

Bruggerstrasse 71a
Baden, CH-5401 Switzerland
www.abb.com/turbocharging
info.turbochargers@ch.abb.com
Hanspeter Zingg
Phone: +41 58 585 4037
Fax: +41 58 585 5144
Product: TCh

Aalborg Industries A/S (Boilers)
www.aalborg-industries.com
Product: D,GT

AccuTech Marine Propeller, Inc.
www.accutechmarine.com
Product: P,S

American Superconductor Corporation
www.amsuper.com
Product: ED

American Vulkan
www.vulcanusa.com
Product: Couplings

Atlantis Marine Gear Supply
www.marinetransmissions.com
Product: WJ

Atlas Marine Co. Ltd.
www.amcv.bg
Product: D,GT,G

Benjn. R. Vickers & Sons Ltd.

Airedale Mills, 6 Clarence Road, Hunslet, Leeds, LS10 1ND United Kingdom
www.vickers-oil.com
inbox@vickers-oil.com
Sarah Ojelade
Phone: +44 (0) 113 386 7654
Fax: +44 (0) 113 386 7676
Product: P,G,S,B,T,R

Berg Propulsion
www.bergpropulsion.se
Product: P, S, T

Bollinger Shipyards, Inc.

P. O. Box 250, Lockport, LA 70374 USA
www.bollingershipyards.com
sales@bollingershipyards.com
Robert A. Socha
Phone: 985-532-2554
Fax: 985-532-7225
Product: P

Brunvoll AS
www.brunvoll.no
Product: T

Caterpillar
www.caterpillar.com
Product: D, DH, DM

CENTA Corporation

815 Blackhawk Drive
Westmont, IL 60559
(630) 734 - 9600 phone
(630) 734 - 9669 fax
Contact: Mr. Kurt Niederpruem
info@centacorp.com
www.centa.info
Product: S

CENTA Antriebe Kirschey GmbH is a worldwide leader in the development and manufacture of innovative torsional couplings and carbon fiber composite shafting. CENTA Corporation of Westmont, IL, the wholly owned subsidiary serving North America, has a highly experienced staff to assist you with all of your propulsion system needs.

Cooper Bearings

The Cooper Split Roller Bearing Corp
5795 Thurston Avenue
Virginia Beach, VA 23455 - 3378 USA
Telephone 757 460 0925
Fax 757 464 3067
Email info@cooperbearings.com
www.CooperBearings.com
Product: B

Craft Bearings

5000 Chestnut Avenue
Newport News, Virginia 23605
Telephone (757) 247-6000
Fax (757) 247-6300
Email: info@craftbearing.com
www.craftbearing.com
Product: B

Cummins Marine
www.cummins.com
Product: D

Cummins MerCruiser Diesel
www.cmdmarine.com
Product: D,DL,DM,DH

Daihatsu Diesel (shanghai) Co., Ltd.
www.dhtd
Product: D,DM,GT

Detroit Diesel
www.detroitdiesel.com
Product: D

Deutz Corp.

3883 Steve Reynolds Blvd.
Norcross, GA 30093 USA
www.deutzusa.com
radtke.r@deutzusa.com
Ragnar Radtke
Phone: 770-564-7130
Fax: 770-564-7116
Product: D,DM,DH

Donald L. Blount and Associates, Inc.

www.dlba-inc.com
Product: GT,P,G,S,WJ,R

Duramax Marine LLC

17990 Great Lakes Parkway
Hiram, OH 44234 USA
www.DuramaxMarine.com
mschonauer@duramaxmarine.com
Michael Schonauer
Phone: 440-834-5400
Fax: 440-834-4950
Product: B

We build relationships with our clients because your success is our success. That's why we've developed a network of sales representatives and customer service specialists that are the best in the business. These service professionals can answer all your questions, from bearing compatibility to stock availability. And, no one equals the distribution power of Duramax® Marine LLC. With our extensive worldwide network of stocking distributors and regional warehouses, delivery of standard products is immediate - so you don't waste time in dry dock.

Dynaflow, Inc.
www.dynaflow-inc.com
Product: P,WJ

Elka
www.elka.hr
Product: ED

Fairbanks Morse Engine
www.fairbanksmorse.com
Product: D,DM,GT

Fluent Inc.

10 Cavendish Court
Lebanon, NH 03766
www.fluent.com
se@fluent.com
Sharon Everts
Phone: 603-643-2600
Fax: 603-643-3967

Key

B	Bearings
D	Marine Diesel Engines
DL	Low Speed
DM	Medium Speed
DH	High Speed
ED	Electric Drives
G	Gears
GT	Gas Turbines
P	Propellers
PO	Podded Propulsion
S	Shafts
T	Thrusters
TCh	Turbochargers
WJ	Waterjets

Governor Control Systems

3101 SW 3rd Avenue
Fort Lauderdale, FL 33315
www.govconsys.com
ruth.phillips@govconsys.com
Ruth Phillips
Phone: 954-462-7404
Fax: 954-761-8651
Product: D, DL, DM, DH, G, ED, T, TC

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Marine Propulsion Directory

The following Marine Propulsion Directory is the result of a survey e-mailed in October/November 2003. If you would like your company listed in this directory, please forward details to mren@marinelink.com. Publisher not responsible for errors or omissions.

GE Industrial Systems
www.ge.com
Product: ED

GE Marine & Stationary Power
www.getransportation.com
Product: D,DM,TCh

Geislinger
www.geislinger.com
Product: Torsional Vibration Dampers and Elastic Couplings

Hamilton Jet
www.hamjet.co.nz
Products: WJ, T

Harbormaster Marine

www.harbormastermarine.com
31777 Industrial Road
Livonia, MI 48150-1821
Phone: 800-898-5387
Fax: (734) 425-1850
Product: T

HRP USA, Inc.
www.hrp.nl
Product: T

Hundested Propeller A/S
www.hundestedpropeller.dk
Product: P,G,S,T

IHI Marine Engineering (S) Pte Ltd
www.imes.com.sg
Product: D,DL,DM,GT,B,TCh

Industrial Power Systems, Inc
www.ipsswitchgear.com
Product: ED

InPlace Machining

Phone: 800-833-3575
Phone: 414-562-2000
Fax: 414-265-1000
www.inplace.com
E-mail: help@inplace.com
Product: 24-hour Emergency repair, Crankshaft grinding, Metalstitch

Interexpo
www.coupling.gr
Product: Couplings

John J. McMulien Assoc.

Edgewood Towne Center Suite 400
1789 South Braddock Avenue
Pittsburgh, PA 15218
Contact: Tony Phillips
Phone: 412-473-6138
Fax: 412-473-6200
Email: tphillips@jjma.com

Kaplan & Associates, Inc.
www.alkaplan.com
Product: D,P,G,S,B,ED,T,R

Karl Senner Inc.
www.karlsenner.com
Products: G, T, P

Kiene Diesel

Phone: 800-264-5950
Fax: 630-543-5953
www.kienediesel.com
E-mail: info@kienediesel.com
Product: Diesel accesories

Laborde Products.com
www.labordeproducts.com
Product: D,DH,WJ

Lo-Rez Vibration
www.lo-rez.com
Product: Vibration Control

Lufkin Industries, Inc.
www.lufkin.com
Product: G

MAN B&W Diesel Ltd.

MAN B&W Diesel A/S - Copenhagen

MAN B&W AG - Augsburg

www.manbw.com
Product: D,DM,DH

Mapeco Products
www.floodbarriers.com
Product: Keyless shaft couplings

Markisches Werk GmbH
www.mwh.de
Product: Engine Components

Marine Exhaust Systems of Alabama
www.mesamarine.com
Product: Marine exhaust systems - water cooled manifolds, mufflers, exhaust ells, heat exchangers.

Marine Propulsion Products LLC
www.marinethrusters.com
Product: D,P,G,S,B,ED,T,R

Maritime Research Institute Netherlands (MARIN)
www.marin.nl
Product: PO,P,WJ,T

Michell Bearings
www.michellbearings.com
Product: B

MTU
www.mtu-online.com
Product: D

Napier Turbochargers
www.power.alstom.com
Product: TCh

NautiCAN Research & Development Ltd.
www.nautican.com
Product: P,R

NAVALIPS S.A.
www.navalips.es
Product: P

North American Marine Jet Inc.
www.marinejet.com
Product: WJ,T

Northrop Grumman Newport News
www.ngc.com
Product: PO

NREC Power Systems
www.nrecps.com
Product: Engines, rebuilding and repair

O&M Propeller Service Inc.
www.ONMPropeller@AOL.Com
Product: P,S

Omnithruster
www.omnithruster.com
Product: OmniThruster Mixed-Flow Impeller

Orkot Marine

2535 Prairie Rd. Unit. D
Eugene, OR 97402
Phone: 541-688-5529
Fax: 541-688-2079
Contact: Mike Scott
mscott@polymersealing.com
www.orkotmarine.us
Product: B

Outboard Propulsions Systems, LLC
www.jetpac.us
Product: D,WJ

Reagan Equipment
www.reaganpower.com
Product: D, G

Renk Gears
www.renk.de
Product: G

Rice Nozzles
www.ricenozzles.com
Product: P,T,R

Rice Propulsion
www.ricepropellers.com.mx
Product: P,R

Rolls-Royce
www.rolls-royce.com
Product: D, GT, T, P

Sasakura Engineering Co.
www.sasakura.co.jp

Scardana Americas Brokerage
www.scardana.com
Product: Spare Parts

S.E.M.T. Pielstick
www. pielstick.com
Product: D,DM,DH

Schottel GmbH & Co. KG
www.schottel.com
Product: PO,P,WJ,ED,T,R

Sohre Turbomachinery
www.sohreturbo.com
Product: S

Steerprop Ltd.
www.steerprop.com
Product: PO,T

Stork Services (Maritime) B.V.
www.maritime.storkgroup.com
Product: DL

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Chesapeake, VA 23323
Contact: Larry Carlson
Telephone 757-485-4260
Fax: 757-485-7839
1-888-942-4260
wildcat@wildcatprops.com
www.WildCatProps.com

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Wartsila Lips, Inc.

3617 Koppens Way
Chesapeake, VA 23323 USA
(757) 558-3625 phone

Wartsila Propulsion Netherlands B.V.
P.O. Box 6, 5150 BB Drunen
The Netherlands
+31 (0)416 388 483

www.wartsila.com

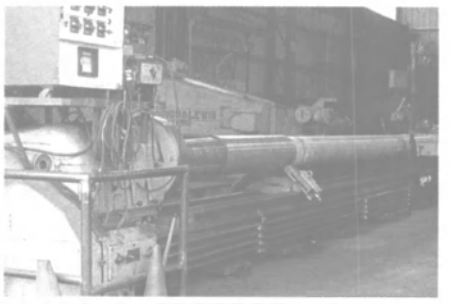
Wartsila delivers completely integrated waterjet propulsion systems with proven technology, application experience and worldwide aftermarket support. As a Wartsila company, we possess the servcie engineer network, spares stocking and repair facilities so critical to global presence.

Everett is ABS Certified for Propeller Shaft Repair

Following two years of intensive effort in both building the specially modified Oerlikon gun lathe shown here, and conducting the regulatory procedures required under the supervision of the American Bureau of Shipping, Everett Engineering, Inc., is fully certified to conduct both carbon steel and stainless propeller shaft weld repair. The control system for its automated wirefeed welding array was designed and built in-shop by its team of control technicians for repairing scoured, gouged and cracked shafts. Everett Engineering's capabilities for straightening bent shafts is unique to the facility.

The main propulsion shaft being machined here is from the U.S. Navy submarine Ethan Allen (SSBN-608). It is 16 in. diameter by 36 ft. long. Maximum capacity of Everett Engineering's shaft repair lathe is 16 in. diameter by 45 ft. long.

Circle 23 on Reader Service Card



Thordon Bearings Inc.
www.thordonbearings.com
Product: B

Thrustmaster of Texas

www.thrustmastertexas.com
E-mail: info@thrustmastertexas.com
Phone: 713-937-6295
Fax: 713-937-7962
Product: T

Toby s Propellers
www.tobyspropellers.com
Product: P

Transmission Engineering Company
www.tecoinc.com
Product: G,WJ,B

Ultra Dynamics Inc
www.ultradynamics.com
Product: PO,WJ

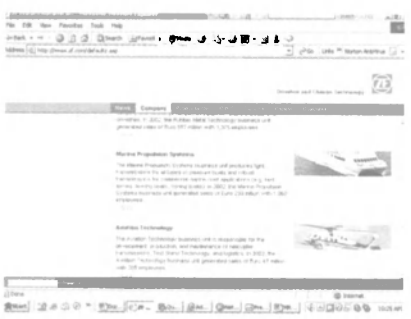
VDMA - German Marine Equipment Industries
www.vdma.com/marine-equipment
Product: D,PO,P,G,T,R,TCh

Vericor Power Systems
vericor.com
Product: GT

Voith Schiffstechnik GmbH
www.voith-marinetechnology.com

Wartsila Corp.
www.wartsila.com
Product: D, G, P, S, T, WJ

ZF Marine Group

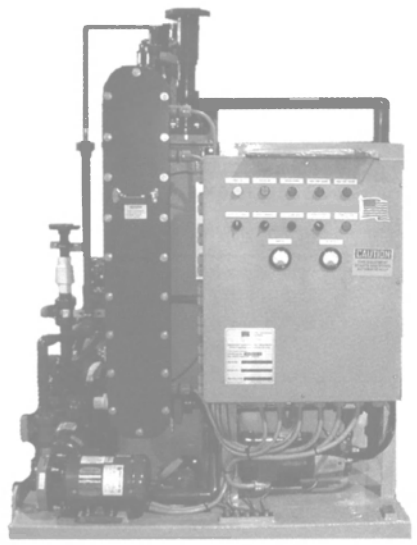


ZF Padova SpA, Via Penghe, 48,
Caselle di Selvazzano
Padova, 35030 Italy
info.zfpadova@zf.com
Alberto.Kullovitz@zf.com
Alberto Kullovitz
Phone: +39 049 8299 559
Fax: +39 049 8299 550
Product: P,G,B

Severn Trent De Nora to Supply Rigdon OSV's

Severn Trent De Nora will supply its Omnipure marine sanitation device and UltraDynamics ultraviolet disinfection system for Rigdon Marine's new fleet of 10 64-m offshore supply vessels (OSV) being built at Bender Shipbuilding in Mobile, Ala. The equipment is part of the complete onboard sewage treatment plant that processes and purifies wastewater for overboard disposal. The ultraviolet system purifies potable water, while the custom-designed Omnipure marine sanitation system process all non-oily wastewater.

"Severn Trent is an excellent company with excellent equipment," said Larry Rigdon, chairman and CEO of Rigdon Marine. "I want only the best for my



fleet, and I want to set the environmental standard as the cleanest fleet in the Gulf of Mexico." According to the manufacturer, the Omnipure IMO/USCG Certified treatment process is the only electrolytic type sewage treatment unit available on the market. The skid-mounted solution is touted for its tremendous weight and space saving characteristics, as well as the fact that there is no storage of chemicals or chlorine, and that treatment of influent occurs in approximately 30 minutes.

Circle 28 on Reader Service Card

Arntzen Appointed CEO of OSG

The Board of Directors of Overseas Shipholding Group, Inc. (OSG) announced the appointment of **Morten Arntzen** as the company's new President & CEO. Mr. Arntzen, who last served as CEO of American Marine Advisors, Inc., a U.S. based merchant banking firm specializing in the maritime industry, has extensive experience in the international shipping business. Arntzen, 48, will succeed OSG's longtime CEO, **Morton P. Hyman**, who recently retired at the end of this year.

"I am honored and excited to assume the leadership of OSG, one of the world's premier tanker companies," said Mr. Arntzen. "Under the leadership of Mort Hyman, the Company has modernized its fleet, streamlined its operating cost structure and strengthened its balance sheet. He and his management team have built one of the best platforms for growth in the industry. I look forward to working with the management team to exploit OSG's unique strengths to build and enhance our business." OSG, headquartered in New York, is one of the largest tanker owners in the world and the leading U.S. based bulk shipping company. Its modern fleet comprises 53 vessels totaling 9 million deadweight tons, inclusive of vessels owned in joint ventures.

Simrad Co-Founder Willy Simonsen Dies

The marine electronics world lost a pioneer with the passing of Willy Simonsen on December 4, 2003. Simonsen, who was 90 years old, was the co-founder and driving force behind Simrad, a company that is today part of the Kongsberg Group, the world's largest manufacturer of marine electronics.

It was in 1947 in postwar Norway that Simonsen joined with John Mustad (of Mustad fishhook fame) to form Simonsen Radio AS in Oslo, Norway. In the beginning, the partners focused on manufacturing high quality radio telephones. Within a few years, the company expanded into development and production of echo sounders and sonars for commercial and military use, gaining a worldwide reputation for quality and superior technology.

In 1957, the company opened an office in Horten, Norway and officially changed its name to Simrad, a combination of Simonsen and Radio. Simonsen headed the company he helped form for 21 years, leaving in 1968. He had grown his company from a handful of men into a world-leading manufacturer with 500 people (today the Kongsberg Group employs more than 4,000 worldwide). Looking back at Simonsen's life, it is interesting to see how his talents -- and unfolding world events -- combined to make him a seminal figure in marine electronics.As a scientist in Bergen when World War II came to Norway, Simonsen became actively involved in the underground resistance. He spearheaded a project to eavesdrop on German telephone communications between Oslo and Bergen and provide this information by radio to allied forces in England.

He was arrested by the Gestapo in 1941, and was later moved to a hospital after intentionally swallowing a "sickness pill." Simonsen was rescued from the hospital by Norwegians wearing German military uniforms, and after escaping to England he worked in the Radio Production Unit of the British War Office. It was here that Simonsen developed a tiny shortwave radio receiver - dubbed the "Sweetheart" - of which 50,000 were built and distributed to resistance forces around the world.By providing a communications link between scattered international resistance forces, Simonsen helped win the information war and turn the tide in favor of the allies.

(Photo credit: Aftenposten/Scanpix)

"Willy Simonsen was more than a marine electronics legend, he was a hero who used his communications skills to protect others at great risk to himself," said **John Caballero**, Vice President of U.S. subsidiary Simrad, Inc. "He will be missed by the entire industry."

Ground Broken on "World's Largest" Shipyard

China State Shipbuilding Corp. has broken ground on what it says will be the world's biggest shipyard, a high-tech facility capable of producing cruise ships and natural gas tankers. The yard, being built on an island at the mouth of the Yangtze river, will reportedly eature seven construction docks along a five-mile stretch of coastline, the Shanghai Daily reported. Due for completion in 2015, the yard will be designed to produce a total of 12 million dwt of ships per year. The new yard is being built by the China State Shipbuilding Corp., which incorporates 25 large- and medium-sized shipyards.

Green Named CEO P&O Nedlloyd

P&O and Royal Nedlloyd N.V. announced the appointment by P&O Nedlloyd Container Line Limited of Philip Green as Chief Executive Officer from January 1, 2004. Green was, until recently, Chief Operating Officer of Reuters Group.

Van Solingen Joins GE M&SP

GE Marine & Stationary Power (M&SP) appointed **Rob Van Solingen** sales manager in its global sales force. Van Solingen will be responsible for both GE's marine and stationary power products.

Farstad Wins 5-Year Deals for PSVs

Farstad Shipping has been awarded two five year contracts by Esso Australia for the provision of two dynamic positioning platform supply vessels (Far Scandia and Lady Kari-Ann) to support Esso's production operations in Bass Strait, Australia. The contract turnover is approx. NOK350 million and is scheduled to start in mid January upon the delivery of the Far Scandia to Esso's Barry Beach Marine Terminal.

Hual Increases PCTC Order

HUAL placed an order for two additional car carriers (PCTC) with Daewoo Shipbuilding & Marine Engineering for delivery in 2006 and 2007 respectively. The vessels will have capacity to carry some 6,100 cars and Seven similar vessels are now ordered from Daewoo. The first five vessels are scheduled for delivery in 2004 and 2005. The contract includes options for further vessels

Brostrom Sells Chem Tankers

Brostrom sold the three 5,750-dwt chemical tankers - Bro Nadja, Bro Nelly and Bro Nora - to Wonsild & Son of Copenhagen, Denmark. The three sister vessels were built in 1996 and 1997 with stainless steel tanks primarily designed for transporting chemicals. The sale gives Brostrom a profit of about SEK 30 million and a cash surplus of about SEK 80 million.

Historic Milestone for MAN B&W

MAN B&W Diesel A/S engine orders reached the historical output figure of 100,000,000 kW with the company's range of low speed two-stroke MC engines. About 8,000 MC engines have been ordered or delivered to customers all over the world since the first MC engine, a 6L35MC, was built in Japan by Makita (a sub-licensee of Mitsui) in

C-Map Names Distributor of Singapore ENC Data

C-MAP has been appointed an Official Distributor of Electronic Navigation Charts (ENC) produced by the Maritime and Port Authority of Singapore (MPA) Hydrographic Department. This announcement was made after C-MAP Norway signed an agreement with the MPA. The MPA has been a pioneer in the development of ENCs and is one of the few hydrographic offices that offer complete ENC coverage of national waters supported by an updating service. The waters of Singapore are subject to continual change due to weather and environmental factors. As a result, the MPA surveys the Singapore waters continually. This survey data is collected and included in its navigation chart database on a weekly basis, resulting in a uniquely updated chart database. The MPA supports the International Maritime Organization (IMO) and the International Hydrographic Office (IHO) in the development, testing and implementation of ENC data in ECDIS systems.

Circle 21 on Reader Service Card

1982. Executive Vice President, MAN B&W Diesel A/S, **Peter Sunn Pedersen**, said: "Our MC range of engines has again underlined its powerful position as the most successful two-stroke low speed engine series ever produced. An unsurpassed engineering success proved by the accumulated output of more than 100,000,000 kW. It is indeed a milestone. We are very grateful for the support of our customers who made this achievement possible."

Today, the engines are built in Denmark and by the family of MAN B&W licensees worldwide. The design of the MC range has been continually developed and refined to meet the needs of the market and strict environmental regulations. These engines power all types of vessels, from large oceangoing container ships to smaller local coastal vessels. The MC engine range encompasses 26 marine engines, ranging from the 4S26MC through to the world's most powerful diesel engine, the 14K98MC, with an output of 80,080 kW.

ABB Wins LNG Propulsion Contract

Chantiers de l'Atlantique awarded ABB Marine a contract to supply the electric propulsion system for a new 153,000 cu. m. LNG carrier, owned by Gaz de France. The vessel will be built in France by Chantiers de l'Atlantique and delivered in 2005. To the new Gaz de France LNG carrier, ABB will supply a complete propulsion drive system in a redundant electrical configuration.

Circle 6 on Reader Service Card

New Engine Orders

Sulzer RT-flex96C low-speed diesel engines have been ordered by Odense Steel Shipyard A/S in Lindø, Denmark, for installation in four 3,700 TEU L-class container ships building there for the Danish group A.P. Møller - Mærsk, Safmarine and Deutsche Afrika Linien. The ships are due for delivery in 2004 and 2005The first Sulzer RT-flex96C engines were ordered in April 2003. The eight-cylinder engines will each develop 45,760 kW (62,240 bhp) at 102 rpm. The engines will be built under license from Wartsila Corporation by HSD Engine Co. Ltd. in Korea. This is the second series of Sulzer RT-flex engines contracted by A.P. Møller - Mærsk group companies. The largest RT-flex engines have proved to be most popular, with 29 RT-flex96C engines currently on order, in seven-, eight-, 10- and 12-cylinder configurations. In addition, there are 15 Sulzer RT-flex60C engines and nine Sulzer RT-flex58T-B engines, bringing the grand total of RT-flex engines as confirmed orders or already delivered to 53 with a aggregate power of 2.0 million kW (2.7 million bhp).

Circle 7 on Reader Service Card

Firefighting Technology in Demand

Required by SOLAS and for all existing and new build ships, the PFA -95 Portable Foam Applicator is connected to any shipboard fire hose and provides instant A-FFF foam for duration of 5.5 minutes. The fire fighter can switch from salt water to foam anytime thereby, cooling bulkheads before entering confined spaces or areas to extinguish Class A & B fire. IMSS-CO Inc. has received multitude awards, not only from the commercial ship owners and operators but also US Navy.

Circle 9 on Reader Service Card

Damen Makes Sweeping Changes

Holland's Damen Group will reorganize its four shiprepair yards in the port of Rotterdam as of January 1, 2004, into one completely new shiprepair company that will operate under the name Damen Shiprepair Rotterdam BV. The four yards to be consolidated are Rotterdam United Dockyard, Niehuis & van den Berg BV, Vlaardingen Oost Shiprepair BV and Van Brink Shipyard BV. At headquarters in Schiedam (the Rotterdam United facility), the management team will consist of hans Godlieb, managing director; Steef Staal, director sales & marketing; and Ad Davidse, director of operations and services.

Circle 30 on Reader Service Card

Coastal Marine Wins Refit Deal

Coastal Marine Equipment. Inc. is manufacturing mooring winches for retrofit on several existing ocean going barges. Two hydraulic mooring winches will be supplied to Gulf Marine Repair for installation on barge DBL 105 for K-Sea Transportation (Staten Island). Six two-speed electric mooring winches will be supplied to Penn Maritime for installation on their barges. These projects are in addition to projects for Sause Brothers Ocean Towing (Portland) and Penn Maritime.

Circle 10 on Reader Service Card

Wynn to Outfit First LNG FPSO

Wynn Marine received an order from IHI Marine to supply the window wiper system for the Sanha Project, a first of its kind newbuilding LNG FPSO vessel. Wynn designed the system around two of its most durable wipers, the Type C and Type 1800. The Sanha Project LPG FPSO vessel is in production at the IHI Kure Shipyard in Japan and will be completed in July 2004.

Circle 27 on Reader Service Card

Bachrach & Wood Has New Owner

Bachrach & Wood, formed in 1953 to provide marine surveying and consultancy services, has been sold to James Baily, and the company's headquarters will move from New Orleans to Morgan City.

AMOS Connect for Iridium

Xantic announced that the basic version of AMOS Connect is now capable of working over the Iridium platform. A free of charge CD of this premium quality email service can be ordered from Xantic's website or the software can be directly downloaded and installed.

Circle 12 on Reader Service Card

MOBY Acquires Vessel

Moby Spa reached an agreement with DFDS to acquire Prince of Scandinavia, which will be renamed Moby Drea and will operate on the Livorno-Olbia-Livorno itinerary. Moby Drea will join the 15 other vessels of Moby fleet, and was to arrive in Italy this month to undergo a complete technical and structural refit. It is scheduled to start operating at the end of May 2004.

Stelmar Announces Sale-Lease Back

Stelmar Shipping Ltd. completed, with the assistance of the Fortis Bank, a seven-year sale-lease back transaction for two of its coated Aframax tankers, the 1998-built Takamar and the 1999-built Jacamar. The deal will produce net proceeds of $71 million. Both vessels will remain in the Stelmar fleet and will continue to earn in excess of $19,000 per day for the balance of their existing time charters of more than two years. Stelmar will realize net cash from the sale of $25 million and will record a non-operating book gain of $1 million.

MAN B&W Wins Contracts

MAN B&W Diesel has won orders for engines from the 48/60B and 58/64 medium-speed series for 11 container vessels at three Chinese shipyards. The recently ordered diesel engines are intended for the propulsion of container feeders from the German shipping companies Werner Bockstiegel, Hermann Buss and Peter Doehle. To date, a total of 101 MAN B&W engines, at a capacity of approx. one million hp, manufactured at the Augsburg location, have been ordered from China; 48 engines at a capacity of 400,000 hp during the course of this year alone.

Circle 11 on Reader Service Card

E-Paint Gets USN Authroization

E Paint announced that the U.S. Navy has authorized E Paint SN-1 antifouling paint for use on small boats and craft. Use of E Paint's SN-1 Bottom Coating in Ocean Gray color was specified to meet the Navy's goal to improve overall ship visual camouflage.

Circle 33 on Reader Service Card

V.Ships to Pilot Test New Software

Resurgence Software, Inc. said that V. Ships Group, Ltd. has agreed to pilot the Wave Equipment Optimization System for a portion of its fleet. The Wave system will be used to identify maintenance trends that are not easily identifiable without Wave software's unique set of analysis tools.

Circle 34 on Reader Service Card

General Maritime Options Taken

General Maritime Corp. said options have been exercised to time charter three additional Aframax OBO vessels for two years. The contracts for the these three vessels will provide net voyage revenue to General Maritime in the first year of approximately $21 million and could provide an additional $21 million in the second year through the exercising of the charterer's option.

Vector and MPS to Provide Joint Delivery of ISPS Services

Vector Maritime Software and Maritime Protection Systems (MPS) have announced their joint services to clients to implement the forthcoming ISPS requirements using the Vector Management System

Circle 13 on Reader Service Card

Tribon.com Hits 200,000 Mark

Tribon Solutions announced that the 200,000th product has been published on Tribon.com for access by shipyard designers and design agents globally. An anchor windlass from China's Wuhan Marine Machinery Plant (WMMP) was the company with the 200,000th product. Using Tribon.com shipbuilders can access, download and integrate accurate product information directly into their design.

Tobin to Head Homeland Security Activities at Thales

Thales North America said that **Frank T. Tobin Jr.**, formerly Senior Vice President of Spectrum Solutions Group, has joined the company's Business Development team in the newly created position of Vice President, Homeland Security.

Rolls-Royce MT30 Completes DNV Type Test

The Rolls-Royce MT30 marine gas turbine engine has completed the DNV (Det Norske Veritas) Type Test required to certify the engine at 36MW to DNV's rules for classification of High Speed, Light Craft and Naval Surface Vessels. This test was completed on schedule and represents a significant milestone in the certification sequence of the MT30.

Circle 14 on Reader Service Card

New Oil Spill Prevention Specified for 14 Ships

JLMD Ecologic Group signed its first three orders for a total of 14 ships - eight to be delivered to companies based in the Persian Gulf and six to be delivered to a French company. Other potential orders are awaiting confirmation from ship owners and oil companies that own ships. The confirmed orders for a total of 14 ships have come from Qatar Navigation (two new ships), Qatar Shipping (six new ships), and Jet's Cargo Bulk, a French company established in Greece (six ships, with five new units and one retrofit unit). JLMD Ecologic Group has started the marketing and manufacturing of the JLMD System and is actively seeking financial and/or manufacturing partners worldwide.

Circle 29 on Reader Service Card

Captain Díaz-Monclus New Chairman of IMO Council

The IMO Council, at its 91st session on December 5, 2003, elected Captain **Luis Díaz-Monclus** from Venezuela as Chairman. The Vice-Chairman, Mr. **Johan Franson** from Sweden was re-elected. Captain Díaz-Monclus is Managing Director, Control of Shipping & Search and Rescue (SAR), Venezuelan Maritime Authority, and has a long association with IMO.

Kelvin Hughes Develops Black Box Radar

Kelvin Hughes developed a new Black Box radar that combines performance with the functionality of a full 50 target ARPA (Automatic Radar Plotting Aid) system. Based on the Nucleus product range, the Black Box radar is a state-of-the-art Xband radar, incorporating the full ARPA functionality usually found only on much larger installations.

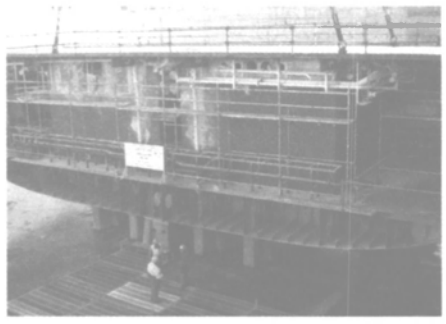
Circle 31 on Reader Service Card

Kongsberg Opens New Orleans Office

Kongsberg Maritime has opened a Customer Support Office in New Orleans. The 6,500 sq. ft. building was officially opened on 27/11/03 and houses a parts warehouse, office space for service engineers and an equipment test lab. The new office is located close to New Orleans International Airport at:
Kongsberg Maritime, James Business Park, 125 James Drive West , Suite 110 St. Rose, La. 70087. Tel:504 712 2799, Email: oyvind.lokling@kongsberg.com

Aker Finnvards Building Birka Paradise

The cruise vessel to be delivered in autumn 2004 for Birka Line had its keel



laid at Aker Finnyards in Rauma. The vessel will be named Birka Paradise. The new vessel 177 m long and 28 m wide comprising eleven decks, five of which are dedicated to passenger accommodation: there are cabins and suites for in all 1,800 passengers. The hull form is optimized to avoid wave forming and bottom suction in the sensitive archipelago environment the vessel will be sailing in.

Propeller Contract Awarded

Public Works and Government Services Canada (PWGSC) awarded a multi-year contract for the manufacture and supply of propeller blades for the Canadian Patrol Frigates (CPF) to Dominis Engineering Ltd. of Ottawa.

Bristol to Oversee Two Newbuilds

Construction is progressing for the new Subchapter K passenger ferry vessels, M/V Isleno at Blount Boats, Inc. and M/V Caribeña at VT Halter Marine. Bristol Harbor Marine Design (BHMD) is serving as a liaison for the Puerto Rico Ports Authority (PRPA), providing construction oversight for the vessels servicing the Fajardo-Vieques-Culebra Ferry Line. On July 15th, 2003, BBI signed a contract with the PRPA to construct a 155-ft. cargo/passenger ferry similar to a previous design by the yard. The construction of this vessel will be similar to the M/V Cayo Norte, built by Blount Marine in 1995. Four MTU DD12V2000 engines coupled to 2.9:1 Twin Disc 5202 gears will provide 3,220 bhp. Two 40kw Northern Lights generators will supply ships service power. The vessel will be equipped with four bronze Rolls Royce 48-in. FP four-blade propellers. Although the original plans were intended to build to U.S. Coast Guard (USCG) Subchapter T regulations, they have been modified by BBI to meet Subchapter K regulations for cargo/ferry service. The vessel is scheduled for delivery March 2004.

On May 12, 2003, VTHMI, a subsidiary of Vision Technologies Systems Inc., signed a contract with the PRPA to

USCG Seeks Ballast Water Treatment Testing Participants

The U.S. Coast Guard announced the beginning of a program aimed at facilitating the installation of experimental shipboard ballast water treatment systems. Foreign and domestic vessel owners that participate in the program may be granted equivalencies to U.S. ballast water regulations for participating vessels. The Shipboard Technology Evaluation Program (STEP) is one of several Coast Guard initiatives aimed at reducing the introduction of nonindigenous species (NIS) to U.S. waters through ballast water. The impacts of NIS on our environment, food supply, economy, health and overall biodiversity of our waterways are significant and increasing.

"This is one of the many things we are doing to protect our waters," said Capt. Dave Scott, chief of the Coast Guard's Office of Operating and Environmental Standards. "Our environmental protection programs, like our security patrols and rescue missions, are all aimed at keeping our waters safe and available for public use and enjoyment."

Later this year, Coast Guard regulations will require that ships coming from outside U.S. waters take steps to eliminate NIS from their ballast water, and future regulations may outline specific NIS ballast water discharge standards. Currently, the predominant method of reducing the number of NIS in ballast water is conducting a mid-ocean exchange, a procedure that not all ships can safely or reasonably conduct. This new program is intended to facilitate the research and development of shipboard ballast water treatment systems, creating more options for vessel owners seeking alternatives to ballast water exchange. Through the STEP, the Coast Guard will grant conditional equivalencies for accepted vessels, as an incentive for vessel owners to participate in shipboard evaluations of prototype treatment systems that might not meet discharge standards mandated by future regulations. The STEP is available to all vessels subject to the Coast Guard's Ballast Water Management regulations, 46 CFR 151 Subparts C and D.

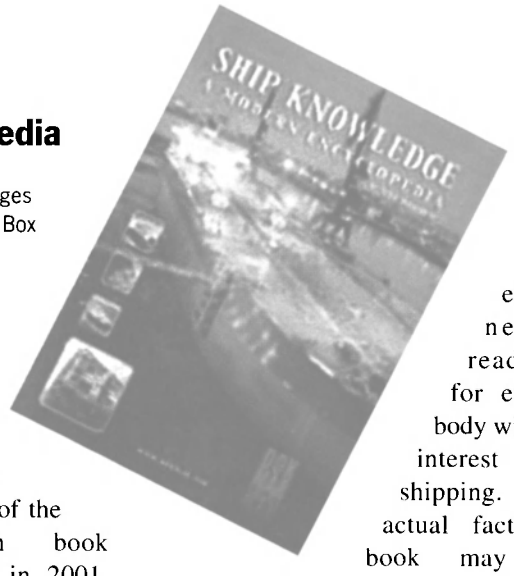
More information on the Coast Guard's ballast water program and STEP application packages are available at: http://www.uscg.mil/hq/g-m/mso/mso4/bwm/step.htm.

Potential applicants should contact the Coast Guard Environmental Standards Division (G-MSO-4) staff at 202-267-2716 or EnvironmentalStandards@comdt.uscg.mil prior to submission, to discuss the criteria for acceptance, application process and documentation requirements. **Applications for STEP may be submitted beginning April 1, 2004.**

Book Review

Ship Knowledge A Modern Encyclopedia

by K. van Dokkum
Bound hard back & front, 341 pages
Published in 2003 by Dokmar, P.O. Box 360, 1600 AJ, Enkhuizen, The Netherlands.
(www.dokmar.com)



The book "Ship Knowledge - A Modern Encyclopedia" is basically the adapted and extended English language version of the very successful Dutch book "Scheepskennis" (published in 2001, author Klaas van Dokkum).

In a state-of-the-art lay-out the book's 16 chapters lead the reader in great detail through the multitude of facts related to ships, ship building and shipping. The parts and systems together forming a modern ship from design drafts up to the finished construction including paint systems and legal aspects, are extensively dealt with. The incorporation of clear and to the point drawings, cross-section drawings, system diagrams and many full-colour pictures and, especially its use of a lucid no nonsense style of English, make the book eminently readable for everybody with an interest in shipping. In actual fact the book may be termed as easy reading; leisure material.

The title "Ship Knowledge - A Modern Encyclopedia" well describes the contents of the book. Veritably this is a book that should be found on every true shipbuilder's bookshelf and thus be close at hand for daily use whenever necessary. Questions that crop up like "What is a reefer ship?", or "What was this thing called again? or "What type of systems do they have for that on board?" or "Which party is responsible for this, that or the other" can now be answered within a fraction of the time otherwise taken by asking colleagues, phoning out to "experts in the field" etc. Lots of colour pictures of ships (and offshore objects as well), drawings (GAP's, ship construction etc.) and system schematics and such, each say more that a thousand words and "Ship Knowledge - A Modern Encyclopedia" is full of such material and thereby produces a wealth of information for those willing to see and receive it. In short, this book may actually be classified as an unmistakable asset to anyone seriously involved in the maritime industry. Besides ship designers, shipbuilders, ship owners, ship's crew, ship charters, ship's sales, ship underwriters, ship financers, classification societies etc. this book should be found on the desk of those studying for professional qualifications within the maritime industry (and indeed others industries close to it). In this respect students attending merchant navy colleges, naval acadamies, shipbuilding and marine engineering graduate and post graduate courses may be certain that there studies will greatly benefit from a number of (easy reading) hours spend in this most interesting encylopedia. The book is so well set up with three columns per page and plenty of colourful illustrations that once you open the first page of this book, it reads almost by itself. You will find that the otherwise dreary chapters such as "Laws and Regulations" (consisting of 22 pages) is over before you realize it...and it was interesting too! This is what you call easy accessible material."

The author has done the utmost (and has succeeded well) to produce a contempory book in which shipknowledge has been presented in the form of a modern encylopedia and is now available as such to all prepared to partake of it's valuable contents. Proof of this success is clearly shown the fact that a number of Dutch Technical Colleges and TU Delft have already put this book on their book list for first year students in marine technology and merchant navy education; No doubt other countries will shortly also follow suite as already much interest is being shown from such areas.

And what's more, I am certainly using it myself (for education and (maritime) industry related purposes). It's on my bookshelf (alongside the first Dutch edition of course!).

Jakob Pinkster M.Sc. FRINA
Marine Technology,
Delft University of Technology

design and build a 95-ft. all-aluminum passenger ferry.

The vessel will be built to USCG Subchapter K regulations for ferry service and is scheduled for delivery in the second quarter of 2004. Two MTU DD12V2000 engines coupled to 2.5:1 Twin Disc Nico MGNV272E gears will provide 1,930 bhp. Two 30 kW generators will supply ships service power. The vessel will be equipped with two NiBrAl 42-in. fixed pitch four-blade propellers.

MSRC, Clean Bay Merge

The Marine Spill Response Corporation (MSRC) and Clean Bay Inc. merged the two organizations' California-based assets effective January 1, 2004. The merged organization will operate as the California Region under the MSRC structure with their principal regional offices located in Concord, Calif. The merger combines the personnel and resources of both organizations into one locally operated organization, and provides access to MSRC's considerable national resources in the event of a large incident.

According to MSRC President Steve Benz, "We are pleased to now provide a seamless spill response system in the Bay area that will further enhance efforts in the event of an oil spill." Steve Ricks, former President of Clean Bay, and now MSRC Vice President for the California Region, added that "By combining these two organizations, we have brought the strongest response capabilities in this area under one company, with readiness to protect the sensitive California coastal environment."

New appointments at IMO

Two new senior level appointments have been made at the IMO. **Koji Sekimizu** of Japan moves across from the Organization's Marine Environment Division to fill Mitropoulos's previous role as Director of the Maritime Safety Division, while **Jean-Claude Sainlos** of France steps up to become Director of the Marine Environment Division.

AIS Buyer's Guide

As expected, the recent mandate for an accelerated implementation of **Automatic Identification Systems (AIS)** onboard ships and boats has rattled the marine manufacturer's proverbial Hornet Nest. Following are some recent product developments from some of the industry's leading companies.

S.G. Brown

A compact Automatic Identification System (AIS) has been added to the range of S.G. Brown marine equipment. The fully type-approved unit is self-contained and touted as the most compact AIS unit on the market. The complete AIS unit measures 6.5-in. wide, 7.4-in. deep and 3.4-in. high. When required the S G Brown/L3 Communications AIS unit can be supplied with any additional parts needed to make the unit fully compliant with ship operations in the U.S., the St Lawrence Seaway and Panama Canal.

Marine Data Systems

Marine Data Systems (MDS) was the first to be granted product approval by the U.S. Coast Guard (USCG) and the Federal Communications Commission (FCC) in the U.S., for it AIMS MIV Automatic Identification System (AIS). Prior to this, MDS has complied with all the AIS specifications and was awarded (Class A) Type Approval by BSH in Germany.

Kongsberg

The Kongsberg Seatex AIS 100 is positioned as a technical solution that enables the identification of other vessels and navaids fitted with the VHF based AIS technology. This can be either on a stand-alone display or on the ship's electronic chart and radar. The Seatex AIS 100 transponder is compact, designed to be easy to operate. The man-machine interface is provided using a Minimum Keyboard and Display (MKD) unit used for input of data to the transponder, displaying position information and reading and writing text messages.

Sailor

Sailor UAIS1900 is an integrated system with a 12-channel GPS and built-in VHF. To format the system so that it is operational, only a display system, such as the new KDU1905, a VHF antenna, a GPS antenna and power are needed. The new Keyboard Display Unit KDU1905 has a graphical display and the targets are either presented graphically or listed alphanumerically. The KDU1905 has large buttons and comes with a large 40 x 24 lines backlit display.

Simrad

Simrad offers the Type Approved Simrad AI70. AIS broadcasts core information over VHF channels. Simrad's AI70 also utilizes GPS and its Russian equivalent GLONASS for positioning information and is also equipped to handle the forthcoming European Global Navigation Overlay System (EGNOS). The Simrad AI70 is based on the Kongsberg Seatex AIS 100 system, which is already well proven in the offshore markets.

L-3

The L-3 AIS is a single box design with integral MKD. Its overall dimensions are 7.3 x 6.4 x 3.3 in. (18.4 x 16.2 x 8.2 cm). This single box includes a DSC controller, a pair of SOTDMA controllers, internal GPS, and integral MKD. Offered with an optional integrated DGPS card and additional DGPS beacon receiver, the L-3 AIS provides DGPS positional information in the event of failure of the ship's primary DGPS system.

Saab TransponderTech

The Saab R4 AIS Vessel Transponder is the fourth generation of Saab AIS. The R4 AIS Class A Transponder System is type-approved by BSH with wheelmark, and complies with all international standards for AIS ship systems. Saab TransponderTech was given type approval by BSH in Germany on their 4th generation of AIS, fulfilling the international standards and requirements. Saab TransponderTech has to date sold more than 3,000 IMO compatible ship transponders.

Nauticast

In preparation for the AIS push in 2004, Nauticast enjoyed a busy Autumn 2003, showing its AIS system to the European market at Europort, and the Asian market at Kormarine. In October the company announced that it had been acquired by the U.K.-based Chelton Ltd., a member of the Cobham plc Group. Nauticast will be managed by Fort Lauderdale, Fla.-based ACR Electronics, Inc., a member of the Chelton Group of Companies. The X-Pack DS was developed and designed by Nauticast and is manufactured exclusively by Siemens Austria. Nauticast considered the standards of associations such as the IMO, IALA, ITU, IHO, and IEC as minimal requirements for the X-Pack DS product development and decided to go beyond these standard requirements and develop their product further by designing it to anticipate not only today's, but also tomorrow's requirements.

SAM Electronics

SAM Electronics' European Wheelmark-accredited Debeg 3400 UAIS has also now been type-approved for GPS operation by the German Maritime & Hydrographic Agency (BSH), enabling it to be connected to all standard navigation equipment for provision of 12-channel Differential GPS data — at no additional cost.

JRC

The USCG and the FCC have awarded JRC's AIS system, the "JHS-180" Type Approval. Previously awarded Type Approvals by EU Wheelmark MED, UK, Japan and Industry Canada, this completes the Approval process for JRC's AIS system, making it available worldwide for most vessels complying with this new IMO requirement. JRC's JHS-180 is compliant with International Marine Organization (IMO) standards: IMO MSC Res.74 (69) Annex 3, ITU-R M. 1371-1, IEC61993-2, IEC60945 and others. The JRC JHS-180 AIS system allows for interface capabilities to Radar, ECDIS, ECS and VDR systems and future expansions. Equipped with a built-in automatic self-diagnostic function and various interfaces, this system will prove to be a favorite for the ship owner.

Furuno

Furuno offers the FA100 AIS, one of the first to be type accepted by the BSH, USCG and FCC. It satisfies all international and U.S. requirements. The FA100 is capable of exchanging navigation and ship data between your ship and other ships or coastal stations. It will send and receive static and dynamic data such as Maritime Mobile Service Identity, IMO number (where available), call sign and name, length and beam, type of ship, range and bearing, course and speed over ground, heading, rate of turn, hazardous cargo type and more. It will also receive voyage-related data and short safety related messages.

Skanti

The SKANTI UAIS 2100 introduced in January 2003, is fully functional by just connecting it to a display system, a VHF and a GPS antenna and power. Its main features include: Wheelmark approval, built in 12-channel GPS and VHF, compact design, flexible installation with just a few external connections, and water-resistance to IP66.

Obstek

Safe Port from Observation Technologies is an integrated vessel traffic information system (VTIS) that combines radar, transponder, AIS and GPS inputs to create a composite display of port activity on NOAA charts on a computer monitor.

FREE INFORMATION

To receive information on the products mentioned in this report, simply check the appropriate number on the **Reader Service Card, found on page 56**, of this edition.

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SAM Electronics	**45**
SG Brown	**40**
Simrad	**39**
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BUYER'S DIRECTORY

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 Buyer's Directory Section, contact Mike Lowe at Lowe@marinelink.com

ACCOMMODATION LADDERS & GANGWAYS

Rampmaster, Inc., 6600 NW 32nd Avenue, Miami, FL 33147, 800-327-8917, 305-694-8270, sales@rampsonline.com, Contact: Al Davis, www.rampsonline.com

AIR CONDITIONING & REFRIGERATION

Adrick Marine Corp. , P.O. Box 1549 , N.Massapequa, NY 11758, 631-491-9475, 631-491-9478, adrick1976@aol.com

Bailey Refrigeration, 4986-1 Euclid Road, Virginia Beach, VA 23462

Cospolich Refrigeration, 14695 Highway 61, Norco, LA 70079

Flagship Marine, Inc, 2427 SE Dixie Hwy , Stuart, FL 34996, 800-316-6426, 772-283-4611, sales@flagshipmarine.com, Contact: Tom Martland, www.flagshipmarine.com

Port-A-Cool, PO Box 2108, Center , TX 75935

Stork Bronswerk Inc., 3755 C Boul. Matte, Brossard, Quebec J4Y 2P4, Canada

Taylor Made Environmental, P.O. Box 15299, Richmond, VA 23227

AIRHORNS/SIGNALING EQUIPMENT

Airchime Manufacturing Co., 5478 267th St., Gloucester Industrial Estate,, Langley, BC V4W 3S8, Canada

Kahlenberg Brothers Co., P.O. Box 358, Two Rivers, WI 54241

ALARMS, FACTORY-MUTUAL APPROVED

NREC Power Systems, 5222 Hwy 311, Houma, LA 70360

Selco USA Inc., 2508 Lakebrook Ct, Atlanta, GA 30360-1715

ALUMINUM BOATS

Island Boats, 6806 Highway 90 East, New Iberia, LA 70560

Metal Craft Marine Inc., 347 Wellington St., Kingston, Ontario K7K 6N7, Canada

Sea Ark Marine, P.O. Box 210, Monticello, AR 71655-0210

William E. Munson Co., 18130 Sunset Way, Edmonds, WA 98026

ALUMINUM SUPPLIER

Aluminum & Stainless Inc, 101 Thru-Way Park, Broussard, LA 70518, 800-252-9074, 337-837-5439, sales@aluminumandstainless.com

ANCHORS & CHAINS

CS Controls Inc. 101 Dickon Road, Houma, LA 70363, 985-876-6040, 985-876-0751, info@cscontrols.com, Contact: Paul Srigley, www.cscontrols.com

GJ Wortelboer Jr. B.V., P.O. Box 5003 , 3008 AA Rotterdam, Netherlands

Washington Chain & Supply, P.O. Box 3645, Seattle, WA 98124

ANTIFOULING

Flexdel Corp. /Aquagard, 1969 Rutgers University Blvd., Lakewood, NJ 08701, 888-353-9335, 732-901-6504, flexabar@sprintmail.com, Contact: Joe, Andy, or Rick, www.aquagard-boatpaint.com

Jotun Paints USA, 9203 Highway 23, Belle Chasse, LA 70037

AUTOPILOT SYSTEMS

AG Marine Inc., 5009 Pacific Highway East 11, Tacoma, WA 98424

Beier Radio, 1990 Industrial Ave, Harvey, LA 70058

ComNav Marine Ltd., 13511 Crestwood PL, Ste 15 15, Richmond, BC V6V 2G1, Canada

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

BALLAST

Ballast Technologies, 4620 S. Coach Dr., Tuscan , AZ 85714

Redland Genstar Inc., Executive Plaza IV, Hunt Valley, MD 10912-1031

BATTERY CHARGERS

La Marche, 106 Bradrock Drive, Des Plaines, IL 60018, 847-299-1188, 847-299-3061, sales@lamarchemfg.com, Contact: John Pawula, www.lamarchemfg.com

BEARING- RUBBER, METALLIC, NON-METALLIC

Cooper Bearing, 5795 Thurston Ave., Virginia Beach, VA 23455

Craft Bearing, 5000 Chestnut Ave., Newport News, VA 23605

Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234

Orkot Composites, 2535 Prairie Rd, Unit D., Eugene, OR 97402, 541-688-5529, 541-688-2079, mscott@polymersealing.com, Contact: Mike Scott, www.orkotmarine.us

Thordon Bearings Inc., 3225 Mainway, Burlington, Ontario L7M 1A6, Canada

BILGE SYSTEMS

Fast Systems, 14040 Santa Fe Drive, Lenexa, KS 66215-1284

Westfalia Separator, Inc., 100 Fairway Court, Northvale, NJ 07647, (201) 767-3900, (201) 784-4399, brown.courtney@wsus.com, Contact: Courtney Brown

BLOCKS & RIGGING

Skookum , P.O. Box 280, Hubbard, OR 97032

BOATBUILDER

Sea Ark Marine, P.O. Box 210, Monticello, AR 71655-0210

Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544

BOLLARDS

Maritime International, 100 E. Vermilion St. #212, Lafayette, LA 70501

BRIDGE SUNSCREENS

Martek Marine Blinds, Unit 46, Century Business Centre, Maversway, Rotherham, South Yorkshire S63 5DA, UK

BROKERS

Marcon International, P.O. Box 1170, Coupeville, WA 98239

BULKHEAD SEALS/PANELS

CSD North America, 880 Candia Rd., Unit 10, Manchester, NH 03109

Thermax, 3115 Range Rd, Temple, TX 76501

BUOYS

Datrex, P.O. Box 1150, Kinder, LA 70648

CAD/CAM SYSTEMS

Albacore Research, 4196 Kashtan Place, Victoria, BC V8X 4L7, Canada

Autoship Systems Corp., Suite 312-611 Alexander Street, Vancouver, BC V6A 1E1, Canada

Cadmatic , Ostra Strandgatan 72 (Vita Huset), FI-20810 Turku, Finland

Creative Systems Inc., P.O. Box 1910, Port Townsend, WA 98368

CAPSTANS

Coastal Marine Equipment Inc., BLDG. 9114 MISAAP Industrial Complex, Stennis Space CTR., MS 39529, 228-813-1700, 228-813-1709, sales@coastalmarineequipment.com, Contact: Ralph Waguespack, www.coastalmarineequipment.com

CS Controls Inc. 101 Dickon Road, Houma, LA 70363, 985-876-6040, 985-876-0751, info@cscontrols.com, Contact: Paul Srigley, www.cscontrols.com

Superior Lidgerwood Mundy, 1101 John Ave., Superior , WI 54880

CARGO MONITORING & CONTROL SYSTEM

Hermatic Inc., 4522 Center St., Deerpark, TX 77536

CAST IRON REPAIR

In-Place Machining, 1929 N . Buttum St, Milwaukee, WI 53212

CHAINS

Crandall Drydock Engineers, PO Box 505804, Chelsea, MA 02150

G.J. Wortelboer, Postbus 5003, 3008 AA Rotterdam, Netherlands

Washington Chain & Supply, P.O. Box 3645, Seattle, WA 98124

CHEMICALS/ CHEMICAL CLEANERS

Uniservice Americas, 57174 Hardin Rd., Slidell, LA 70461

CLASSIFICATION SOCIETY

American Bureau of Shipping, 16855 N. Chase Drive, Houston, TX 77060

CLOSED CIRCUIT TELEVISION

Hernis Scan Systems A/S, Postboks 619, NO_4809 Arendal, Norway

CNC PLATE CUTTING

Advanced Fabricating Inc, PO Box 3721, Galveston, TX 77552

COATINGS/ CORROSION CONTROL/ PAINT

Chugoku Marine Paints, P.O. Box 73, , 4793 , Netherlands

DeFelsko Corp, 802 Proctor Ave., P.O. Box 676, Ogdensburg, NY 13669

Ferro Corp., 1301 North Flora St , Plymouth, IN 46563

Flow International Corp., 23500 64th Ave., South Kent, WA 98059

Hempel Coatings , 10-3511Viking Way, Richmond, BC V6V 1W1, Canada

Jotun Paints USA, 9203 Highway 23, Belle Chasse, LA 70037

MK Production Resources Inc., 1610 Reynolds Street, Brunswick, GA 31520

Nace International, 140 South Creek Dr., Houston, TX 77084

NAPASCO Inc., 213 Main Project Road, Shriever, LA 70395, 985-449-0730, 985-449-0740, napasco@napasco.com, Contact: Pam Bartell, www.napasco.com

Resto Motive Laboratories, P.O. Box 1335, Morristown, NJ 07962-1235

Sherwin Williams, 101 Prospect Ave., Cleveland, OH 44115

Sigma USA, P.O. Box 816, Harvey, LA 70059

COMMUNICATIONS

Inmarsat Ltd, 99 City Rd , London EUY 1AX, UK

L-3 Communications, 6000 Fruitville Road, Sarasota, FL 34232

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

Seawave, 76 Hammarlund Way, Middletown, RI 02842

World-Link Communications, 74 Main St., Framingham, MA 01701

COMMUNICATIONS SERVICE

Maritel Marine Communications, 16 E. 41st Street, NY, NY 10017

COMPOSITE SHAFTS

Centa Corp., 815 Black Hawk Drive, Westmont, IL 60559

COMPOUNDS

Philadelphia Resins, P.O. Box 309 , Montgomeryville, PA 18936

COMPUTER SOFTWARE MONITORING SYSTEMS

Azonix Corp., 900 Middlesex Turnpike, Bldg 6, Billerica, MA 01821, (978) 670-670-6300, (978) 670-8855, ProPanel-Mariner@azonix.com

COMPUTER/ COMPUTER SOFTWARE

Autoship Systems Corp., Suite 312-611 Alexander Street, Vancouver, BC V6A 1E1, Canada

Creative Systems Inc., P.O. Box 1910, Port Townsend, WA 98368

Spec Tec , Professor Koths Vey, 1366 Lysaker, Norway

CONSOLE- GMDSS

Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

CONSULTANTS

Captain R.J. Underhill & Associates, P.O. Box 1030, Groves, TX 77619

Elliot Bay Design Group, 5301 Shilshole Ave. NW, Ste. 200, Seattle, WA 98107

Hornblower Marine Services, P.O. Box 112476, Campbell, CA 95011-2476

CONTROL SYSTEM- MONITORING/STEERING

Beier Radio, 1990 Industrial Ave, Harvey, LA 70058

Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065

Electrowave U.S.A., 6125 W. Sam Houston Pkwy., Ste 406, Houston, TX 77041

G.R. Bowler, 2261 Lake Rd., Ontario, NY 14519

Kobelt Manufacturing Co., Ltd., 8238-129 Street, Surrey, BC V3W0A6, Canada

L-3 Communications Westwood Corp;Tano Div., 5700 Citrus Blvd, Ste E, New Orleans, LA 70123, 504-733-4777/ 1-800-229-TANO, 504-734-2127, guy.hardwick@l-3com.com

MMC International, 60 Inip Dr, Inwood, NY 11096

Prime Mover Controls, 3600 Gilmore Way, Burnaby, BC V5G 4R8, Canada

Tano Corp., 57017 Citrus Blvd., Ste. E, New Orleans, LA 70123

CORROSION CONTROL

Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607

Gardner Denver Water Jetting Systems, 8807 Emmett Rd., Ste 100, Houston, TX 77040

Ultra Strip, 3515 SE Lionel Terrace , Stuart, FL 34996

COUPLERS- TUG & BARGE

ntercontinental Engineering , PO Box 9055 , Kansas City, MO 64168

COUPLINGS

American Vulkan, 2525 Dundee Rd, Winter Haven, FL 33884

Centa Corp., 815 Black Hawk Drive, Westmont, IL 60559

Geislinger Corporation, 200 Geislinger Drive, Battle Creek, MI 49015

Interexpo Ltd Couplings In Stock, Plateia Theatrou 4, Athens 105 52, Greece, +30 210 3245666, +30 210 3248666, +30 210 3249666, interexpo@interexpoltd.gr, Contact: Marie Helene Charon, www.coupling.gr

Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478

MMC International, 60 Inip Dr, Inwood, NY 11096

CRANE - HOIST - DERRICK - WHIRLEYS

Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178

CS Controls Inc. 101 Dickon Road, Houma, LA 70363, 985-876-6040, 985-876-0751, info@cscontrols.com, Contact: Paul Srigley, www.cscontrols.com

E. Crane, 241 Executive Dr., #3, Marion, OH 43302

Holly Hoist Corp, P.O. Box 86, St. Clair Shores, MI 48080

Liebherr Werk Nenzing GMBH, P.O. Box 10, A-6710, Nenzing, Austria

CRANKSHAFT REPAIR

In-Place Machining, 1929 N . Buffum St, Milwaukee, WI 53212

Waltz & Krezner, 91 Willenbrock Rd , Oxford, CT 06478

CUTTING & WELDING MACHINES

Bug-O-Systems, 3001 W. Carson St., Pittsburgh, PA 15204

ESAB Cutting Systems, 411 South Ebenezer Road, Florence, SC 29501

DECK MACHINERY- CARGO HANDLING EQUIPMENT

Coastal Marine Equipment, Bldg 9114 MiSAAP Ind. Complex, Stennis Space Center, MS 39529

Coastal Marine Equipment Inc., BLDG. 9114 MISAAP Industrial Complex, Stennis Space CTR., MS 39529, 228-813-1700, 228-813-1709, sales@coastalmarineequipment.com, Contact: Ralph Waguespack, www.coastalmarineequipment.com

CS Controls Inc. 101 Dickon Road, Houma, LA 70363, 985-876-6040, 985-876-0751, info@cscontrols.com, Contact: Paul Srigley, www.cscontrols.com

Intercontinental Engineering , PO Box 9055 , Kansas City, MO 64168

Markey Machinery, P.O. Box 24788, Seattle, WA 98124

McElroy/Catchot Winch Company, Inc., P.O. Box 4632, Biloxi, MS 39535-4632

Rapp Hydema, 4433 27th Ave. West, Seattle, WA 98199

Smith Berger Marine, 7915 10th Ave. S., Seattle, WA 98108

Superior Lidgerwood Mundy, 1101 John Ave., Superior , WI 54880

W.W. Patterson , 3 Riversea Road, Pittsburgh, PA 15223

DEHUMIDIFIERS

EBAC Industrial Products, 704 Middle Ground Blvd, Newport News, VA 23606, 800-433-9011, 757-873-3632, sales@ebacusa.com, Contact: Gray Coughlan, www.ebacusa.com

DESALINATION - REVERSE OSMOSIS

G.E.T. Inc., 3135 Golden Ave., Long Beach, CA 90806

Reverse Osmosis of South Florida, Inc., 150 S.E. 29th St., Fort Lauderdale, FL 33316

DIESEL CYLINDER INDICATORS

Kiene Diesel, 325 S. Fairbanks St., Addison, IL 60101

DIESEL ENGINE OVERHAUL

Detroit Diesel Corporation, 13400 Outer Drive West, Detroit, MI 48329-4001

Motor-Services Hugo Stamp, 3101 S.W. 3rd Ave., Ft. Lauderdale, FL 33315

DIESEL ENGINE- SPARE PARTS & REPAIR

Aquamarine Engineering, P.O. BOX 83495, San Diego, CA 92138

Caterpillar, Inc., P.O. Box 610, Mossville, IL 61552-0610

Chris MArine AB, Box 9025, 200 39 Malmo, Sweden

Cummins Marine, 4500 Leeds Ave , Ste 301, Charleston, SC 29405

GE Marine Engines, 1 Neuman Way, Cincinatti, OH 45215

Giro Engineering Limited, Talisman, Duncan Road, Park Gate, Southampton, Hants SO31 7GA, UK

Man B&W Diesel, 17 State St., NY, NY 10004

Man B&W Diesel A/S, Teigtholmsgade 41, Copenhagen SV DK-2450, Denmark

Man B&W Diesel AG, Stadtbachstrasse 1, Augsberg D-86153, Germany

Marine Exhaust Systems of Alabama, P.O. Box 698, 757 Nichols Ave., Fairhope, AL 36533

Marine Turbo & Diesel Inc., 1090 7th St , Richmond, CA 94801

Mariso USA, Inc., 100 Davidson Ave., Somerset, NJ 08873

Motor-Services AB, Box 2115 , Ronninge S- 144 04, Sweden

Motor-Services Hugo Stamp, 3101 S.W. 3rd Ave., Ft. Lauderdale FL 33315

NREC Power Systems, 5222 Hwy 311, Houma, LA 70360, 985-872-5480, 985-872-0611

Reagan Equipment, 2550 BelleChase Hwy, Gretna, LA 70054

Scandana Americas Bkg., 502 Empire St. , Greenfield Park J4V 1V7, Canada

Wartsila Diesel, 201 Defense Hwy, Annapolis , MD 21401

DIESEL FUEL DECONTAMINATION

Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

DIGITAL TORQUE METER SYSTEMS

Instruments, Computers & Controls, 78 Londonderry Tpke, Hookset, NH 03106

DISPLAY TECHNOLOGY

Kent Modular Electronics Ltd., 611 Maidstone Road, Rochester, Kent, UK

DIVING & SALVAGE

Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178

DOCK FENDERING SYSTEMS

Plastic Pilings Inc., 1485 South Willow Ave., Rialto, CA 92376

DOCUMENTATION/DATABASES

Zaetric Business Solutions, LLC, 24800 I-45 North, Suite 324, Houston, TX 77386, 713-824-1654, 713-621-4885, inquiries@zaetric.com, Contact: David Woody, www.zaetric.com

DOOR LOCKS

The Brass Works Inc., P.O. BOX 566, DeLand, FL 32721, 386-943-8857, 386-943-8810, info@marinedoorandcabinethardware.com

DOORS- MARINE & INDUSTRIAL

Deansteel Mfg., 111 Merchant St , San Antonio, TX 78204

Joiner Systems, 1925 52nd Avenue, Lacine, Quebec H8T 3C3, Canada

Juniper Industries Inc, 72-15 Metropolitan Avenue, Middle Village, NY 1379, 718-326-2546, 718-326-3786, marinesales@juniperindustries.com, Contact: Sales, www.juniperindustries.com

Juniper international, 72-15 Metropolitan Ave., Middle Village, NY 11379

Manly Marine, P.O. Box 86788, N. Vancouver, BC V7L 4L3, Canada

Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478

USA Sliding Doors, Inc., 801 Hosmer Road, Churchville, NY 14428, 585-538-4160, 585-538-2806, info@usaslidingdoors.com, Contact: Mr. Robert Weiland, www.usaslidingdoors.com

Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

DRIVES

Allied Systems, 2300 Oregon St., Sherwood, OR

DRIVESHAFTS

The Cline Company, 600 Buncombe St., Greenville, SC 29602

DRUG TEST KITS

Sun State Specialty K-9s, 1500 Beville Road, Daytona Beach, FL 32114

DRY DOCKS- DESIGN

Crandall Drydock Engineers, PO Box 505804, Chelsea, MA 02150

ELASTOMER PIPING PRODUCTS

Elasto Valve Rubber, 1691 Pioneer Road, Sudbury,ON PG3 1R2, Canada

ELECTRIC & CONTROL SYSTEMS

Geniro Systems Inc., 1885 Boul Dagenais West, Laval, QC H7L 5A3, Canada, 450-622-7575, 450-622-8484, stefan@genirosys.com

ELECTRICAL EQUIPMENT

MMC International, 60 Inip Dr, Inwood, NY 11096

Olsun Electrics Corporation, 10901 Commercial Street, Richmond, IL 60071-0001

ELECTRONIC CHARTS

C- Map Commercial, 133 Falmouth Rd, Mashpee, MA 02649

Navionics, 6 Thatcher Lane, Wareham, MA 02571, 800-848-5896/508-291-6000, 508-291-6006, sales@navionics.com

EMERGENCY DISTRESS SIGNAL

Greatland Laser, LLC., 4001 West International Airport RD, Anchorage, AK 99502, 907-245-4475, 907-245-4599, laser@alaska.net, Contact: Jim O' Meara, www.greatlandlaser.com

EMPLOYMENT

All American Marine, P.O. Box 191237, Tillman's Corner, AL 33619

ENGINE ROOM LIGHTING/ MONITORING & CONTROL

GMT Electronics, 171 Main St , South River, NJ 08882

ENGINES

BTMC, 5810 Columbus Pike, Lewis Center, OH 43035, 740-548-4282, 740-548-5756, davemiller@btmccorp.com, Contact: Dave Miller, www.btmccorp.com

Fairbanks Morse, 701 White Avenue, Beloit, WI 53111

GE Marine Engines, 1 Neuman Way, Cincinatti, OH 45215

Pri Products-Power Research Inc.s-, 6970 Portwest Drive, #180, Houston, TX 77063

EVAPORATORS

Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974

Beaird Industries, 601 Benton Keily St. , Shreveport, LA 71106

Sasakura Engineering , 7-32 Takeshima, 4-Chome, Nishiyodogoaw KY Osaka555, Japan

EXHAUST

Marine Exhaust Systems of Alabama, P.O. Box 698, 757 Nichols Ave., Fairhope, AL 36533

EXPANSION JOINTS

Elasto Valve Rubber, 1691 Pioneer Road, Sudbury,ON PG3 1R2, Canada

Silex inc., 6659 Ordan Dr., Mississauga, ON L5T 1K6, Canada

EXTRUDED RUBBER PRODUCTS

Clean Seal inc., PO Box 2919, South Bend, IN 46880

FASTNERS

Superbolt, PO Box 683, Carnegie, PA 15106

FENDERING SYSTEMS/ BUOYS - DOCK & VESSEL

Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234

Fender Care Americas Inc C/-OBC Shipping Inc... 7611 Lake Road South Mobile, Mobile, MIddle Bay Port Building 305., AL 36605, +44 78029 65765, wendy.stephan@fendercare.com, Contact: Wendy Stephan, www.fendercare.com

Maritime International, 100 E. Vermilion St. #212, Lafayette, LA 70501

Plastic Pilings Inc., 1485 South Willow Ave., Rialto, CA 92376

Poly-Hi-Solidur, 2710 American Way, Ft. Wayne, IN 46899

Schuyler Rubber Co., 16901 Woodred Rd., Woodinville, WA 98072

Seaward International, P.O. Box 98, Clearbrook, VA 22624

Urethane Products, 9076 Rosecrans Ave, Bellflower, CA 90706

Viking Fender Co., 1160 State St , Perth Amboy, NJ 08861

FILTER INSERTS

CC Jensen Inc, 1557 NW Ballard Way, Seattle, WA 98107, 206-789-1710, 206-789-1747, ccjensen@ccjensen.com, Contact: Sales, www.ccjensen.com

FILTERS/FILTER SYSTEMS

AAF International, 10300 Ormsby Park Pl. STE 600, Louisville, KY 40223, 888-388-0529, 888-398-0529, mbragg@aafintl.com, Contact: Myles Bragg, www.aafintl.com

Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

Boll Filter, 9822 General Drive, Ste. 180, Plymouth, MI 48170

G.E.T. Inc., 3135 Golden Ave., Long Beach, CA 90806

Hellan Strainer, 3249 East 80th St., Cleveland, OH 44104

US Filter , 2 Milltown Ct., Union , NJ 07083

FIRE & SAFETY PRODUCTS

Brookdale International, 1--8755 Ash St., Vancouver, BC V6P 6T3 Canada

DBC Marine Safety Systems, 101-3760 Jacombs Rd., Richmond BC V6V 6T3, Canada

FSTA/Fire Services Program, 9030 N. Willis, Stillwater , OK 74078-8045

IMSSCO Corporation, 2040 Harbor Island Drive, Ste. 201 A, San Diego, CA 92101

Pt. Canaveral Marine Fire Fighter Academy, P.O. Box 267, Cape Canaveral, FL 32920

FLANGES

Jesse Engineering, 5225 7th St., E. Tacoma, WA 98424

FLOW CONTROLS
Hoffer Flow Controls, 107 Kitty Hawk Lane, Elizabeth City, NJ 27906

FLUID SEALING & PACKING
The Delmar Company, Highway 60 Rte 4, Dillwyn, VA 23426

FUEL ADDITIVES
Pri Products-Power Research Inc.s-, 6970 Portwest Drive, #180, Houston, TX 77063

GALLEY EQUIPMENT
AR Larsen Co., 15040 NE 95th St., Redmond WA 98052
Cospolich Refrigeration, 14695 Highway 61, Norco LA 70079
Jamestown Metal Marine Sales, Inc., 4710 Northwest 2nd Ave., Boca Raton, FL 33431

GALLEYS
Deansteel Mfg., 111 Merchant St., San Antonio, TX 78204

GANGING & SAMPLING
Hermatic Inc., 4522 Center St., Deerpark, TX 77536

GAS GENERATION SYSTEMS
Air Products AS, Box 8100, Vagsbygd NO-4675 Kristiansand S, Norway

GAS TURBINES
GE Marine Engines, 1 Neuman Way, Cincinatti, OH 45215

GEARS & GEAR REPAIR
Karl Senner Inc., 25 W Third, Kenner, LA 70062

GENERATOR CONTROLS
Detroit Diesel Corporation, 13400 Outer Drive West, Detroit, MI 48329-4001

GMDSS- GEAR BOXES & BEARINGS
Beier Radio, 1990 Industrial Ave, Harvey, LA 70058

GOVERNORS
Governor Control Systems, 3101 SW 3rd Avenue, Ft. Lauderdale, FL 33315

GPS
Leica Navigation, 23868 Hawthorne Blvd, Torrance, CA 90505-5908
Standard Horizon, 10900 Walker St., Cypress, CA 90630

GROUNDINGS
Sohre Turbomachinery, 132 Gilbertville Rd, P.O. Box 889, Ware MA 01082-0889

HATCHES & DOORS
Juniper International, 72-15 Metropolitan Ave., Middle Village, NY 11379
Manly Marine, P.O. Box 86788, N. Vancouver, BC V7L 4L3 Canada

HEAT EXCHANGERS
Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Aquamarine Engineering, P.O. BOX 83495, San Diego, CA 92138
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234
Tranter, Inc., P.O. Box 2289, Witchita Falls, TX 76307, 940-723-7125, 940-723-1131, www.tranterphe.com

HEAVY FUEL TREATMENT
Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

HIGH SPEED FERRY BUILDERS
Incat Australia Pty. Ltd, 18 Bender Marine, Hobart 7009, Australia

HMI CONTROLS DISPLAY
Azonix-Dynalco, 3690 NW 53rd St., Ft. Lauderdale, FL 33309

HOISTS
Coastal Marine Equipment, Bldg 9114 MISAAP Ind. Complex, Stennis Space Center, MS 39529

HORNS/WHISTLES
Airchime Manufacturing Co., 5478 267th St., Gloucester Industrial Estate., Langley, BC V4W 3S8, Canada
Kahlenberg Brothers Co., P.O. Box 358, Two Rivers, WI 54241
Kockum Sonics LLC, 933 Industry Road Suite 105, Kenner, LA 70062

HOSES/HOSE FITTINGS
JGB Enterprises, Inc., 115 Metropolitan Dr., Liverpool, NY 13088

HYDRAULIC SYSTEMS
Allied Systems, 2300 Oregon St., Sherwood, OR
Anchor Lamina, 38565 Country Club Drive, Farmington Hills, MI 48331

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

INFRARED IMAGING EQUIPMENT
Flir Systems, 16505 SW 72ND AVE, Portland, OR 97224

INSPECTION EQUIPMENT
Staveley Instrument, 421 N. Quay St., Kennewick, WA 99336

INSTRUMENTATION
Hoffer Flow Controls, 107 Kitty Hawk Lane, Elizabeth City, NJ 27906
Thermo Electron, 6801 Cochran Rd., Solon, OH 44139

INSULATION
M & A Supply LLC, 150 North Plains Industrial Rd., Wallingford, CT 06492, 203-294-9431, 203-294-1697, sales@ma-supply.com, Contact: Jeff Blake, www.ma-supply.com
Mascoat Products, 10890 Alcott, Unit 12, Houston, TX 77043
Pacor, Inc., P.O. Box 107, Westville, NJ 08093
Superior Energies Inc., 3115 Main Ave., Groves, TX 77619

INSURANCE SERVICES
WQIS, 80 Broad St., 21st Floor, New York, NY 10004

INTERIOR DESIGN
Global Interior Group, 2426 Dennis Street, Jacksonville, FL 32204

INTERIORS
Custom Ship Interiors, Inc., P.O. Box 882, Solomons, MD 20688
Directions In Design, Inc., 1849 Craig Road, St. Louis, MO 63146, 314 205-2010, 314 205-0889, May-Zinsers@didinc.com, Contact: Sharon May-Zinser, www.didinc.com
Global Interior Group, 2426 Dennis Street, Jacksonville, FL 32204
Hopeman Brothers, P.O. Box 820, 435 Essex Ave, Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc., 4710 Northwest 2nd Ave., Boca Raton, FL 33431
Lit Industries, 516 Costner School Rd., Bessemer City, NC 28016-9801
Panel Specialists Inc./Thermax N.A., 3115 Range Road, Temple, TX 76504-1240, 254-774-9800, 254-774-7222, thermax@erols.com, Contact: John Hutchison, www.panelspec.com

JOINER- WATERTIGHT DOOR-PANELING-CEILING SYSTEM
Custom Ship Interiors, Inc., P.O. Box 882, Solomons, MD 20688
Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro VA 22980
Joiner Systems, 1925 52nd Avenue, Lacine, Quebec H8T 3C3, Canada
Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

K-9 DETECTION
Sun State Specialty K-9s, 1500 Beville Road, Daytona Beach, FL 32114

KEEL COOLERS
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234

LASER ALIGNMENT
Ludeca, Inc., 1425 NW 88th Ave, Miami, FL 33172

LAUNDRY EQUIPMENT
Richard Galley Supply, PO Box 4035, Houma, LA 70361

LEAK REPAIR
Indumar Products Inc., 2500 Tanglewilde, Suite 260, Houston, TX 77063

LIFEBOAT TESTING
Water Weights, Inc., 5139 Brook St., Suite E, Mont Clare, CA 91763

LIFEBOATS/RAFTS
DBC Marine Safety Systems, 101-3760 Jacombs Rd., Richmond, BC V6V 6T3, Canada
Survival Systems International, P.O. Box 1567, 931 Industry Rd., Kenner, LA 70062, 504-469-4545, 504-466-1884, service@ssinola.com
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136
Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806
Wolong International, 151 Chin Swee Road #03-14, Manhattan House, 169876, Singapore

LIFESAVING EQUIPMENT
C.M. Hammar AB, August Barks Gatan 15, 421 32 Vastra Frolunda, Sweden
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136

LIFT EQUIPMENT
Mi-Jack Products, 3111 West 167th St., Hazel Crest, IL 60429

LIFT EQUIPMENT TESTING
Water Weights, Inc., 5139 Brook St., Suite E, Mont Clare, CA 91763

LIGHTING SYSTEMS/ EQUIPMENT
ACR Electronics Inc., 5757 Ravenswood Rd., Ft. Lauderdale, FL 33310-5247
Archway Marine Lighting, 4501 Swan Ave, St. Louis, MO 63110
L.C. Doane, P.O. Box 975, Essex, CT 06426

LINE & NET CUTTERS
Spurs Marine, 201 S.W. 33rd St., Ft. Lauderdale, FL 33315

LUBRICANTS
Exxon Mobil Marine Lubricants, 3225 Gallows Road, Fairfax, VA 22037, 1+609-409-2741, 1+609-409-5699, unknown, Contact: unknown, www.exxonmobil.com
Pri Products-Power Research Inc.s-, 6970 Portwest Drive, #180, Houston, TX 77063

LUBRICANTS/LUBRICATION SYSTEMS
Benjamin R. Vickers & Sons Ltd., Airedale Mills, 6 Clarence Road, Leeds, W. Yorkshire LS10 IND, UK
Companion Products, Inc., 2040 Johnson Ct, Unit A, Kingston, IL 60145-0009

MACHINERY MAINTENANCE, REPAIR & TESTING
Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

MANEUVERING EQUIPMENT
A. Van der Velden Marine Systems, Birkenweg 11, D-214465, Reinbek, Germany

MARINE CONSTRUCTION/REPAIR
Sundial Marine, 5605 N.E. Sundial Road, Trautdale, OR 97060

MARINE CONSULTANTS
Hall Associates of Washington, P.O. Box 1554, Mukiteo, WA 98275

MARINE DECKING & FLOORING
Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980
SlipNOT Metal Safety Floorings (Div. of W.S. Molnar Company), 2545 Beaufait St., Detroit, MI 48207

MARINE DIESEL ENGINES
MAN Engines & Componets Inc., 591 SW 13th Terrace, Pompano Beach, FL 33069, 800-MAN-2842, 954-946-9098, www.man-mec.com

MARINE ELECTRONICS
ACR Electronics Inc., 5757 Ravenswood Rd, Ft. Lauderdale, FL 33310-5247
Beier Radio, 1990 Industrial Ave, Harvey, LA 70058
Comark Marine, 93 West Street, Medfield, MA 02052
GMT Electronics, 171 Main St., South River, NJ 08882
Hatteland Display, Bogstadveien, 19, , N-0355 Oslo, Norway
Jotron Electronics, Box 85, NO-328OT Jodalyng Norge, Norway
Leica Navigation, 23868 Hawthorne Blvd, Torrance, CA 90505-5908
Marine Electronic Solutions, 1522 Crabapple Cove, Jacksonville FL 32225
Saab Marine Electronics, Box 13045, 402 5Goteborg, Sweden
Standard Horizon, 10900 Walker St., Cypress, CA 90630

MARINE ENGINEERING
Elliot Bay Design Group, 5301 Shishole Ave, NW, Ste, 200, Seattle, WA 98107

MARINE EQUIPMENT
Plastic Pilings Inc, 1485 South Willow Ave, Rialto, CA 92376
Scardana Amencas Bkg, 502 Empire St, Greenfield Park J4V 1V7, Canada
Waterman Supply, P.O. Box 596, Wilmington, CA 90748

MARINE FURNITURE
Deansteel Mfg., 111 Merchant St., San Antonio, TX 78204

MARINE GLASS
ProCurve, 3535 Davisville Rd., Hatboro, PA 19040

MARINE HARDWARE
HMS Marine Hardware, 333 W. Merrick Road, Valley Stream, NY 11580-5219

MARINE LIGHTING & ELECTRICAL SUPPLIES
Manning Electric Inc., 154 27th Street, Brooklyn, NY 11232, 718-832-2488, 718-832-2493, info@manning-electric.com, Contact: Anthony Menditto, www.manning-electric.com

MARINE MANAGEMENT
Hornblower Marine Services, P.O. Box 112476, Campbell, CA 95011-2476

MARINE POWER PLANT SYSTEMS
Auramarine Ltd., Box 849, FI-20101 Turku, Finland

MARINE RADIOS
Standard Honzon, 10900 Walker St., Cypress, CA 90630

MARINE SENSORS
Airmar Technology Corp., 35 Meadowbrook Drive, Milford, NH 03055, 603-673-9570, 603-673-4624, sales@airmar.com, Contact: Peter Braffitt, www.airmar.com

MARINE SERVICES
Conam Inspection, 192 International Blvd., Glendale Heights, IL 60139

MARINE THERMAL IMAGING
Anon International, 720 Glen Eagle Drive #100, Winter Springs, FL 32708

MARITIME TRAINING & SCHOOLS
Manne Safety International, Marine Terminal, Laguardia Airport, NY 11371

METALIZING
International Metalizing & Coatings, PO Box 201, Cherry Hill, NJ 08003

METERS
Selco USA, Inc., 2508 Lakebrook Court, Atlanta, GA 30360-1715, 1-877 selcous (1-877-735-2687) 770-455-9110, 770-455-3754, info@selcousa.com

MONITORING ALARM/CONTROL
Marine Electric Systems, Inc., 33 Route 17 South, East Rutherford, NJ 07073, 201 531-8600 Ext 231, 201 531-8606, info@marineelectricsystems.com, Contact: Gary Mandell, www.Marineelectricsystems.com

MONITORING SYSTEMS
G.R. Bowler, Inc. Marine Controls, 2261 Lake Rd, Ontario, NY 14519, 800-524-9570, 315-524-8753, gary@grbowler.com, Contact: Gary R Bowler, www.grbowler.com
Mackay Communications, 2721 Discovery Dr, Raleigh, NC 27616-1851
Pnme Mover Controls, 3600 Gilmore Way, Burnaby, BC V5G 4R8, Canada

MOORAGE FACILITY
Sea Ark Marine, P.O. Box 210, Monticello, AR 71655-0210

MOTOR PROTECTION
Marine Safe Electonics, 261 Milway Ave, #12, Concord, Ontario L4K 4K9, Canada

NAV/COMM EQUIPMENT
Beier Radio, 1990 Industnal Ave, Harvey, LA 70058
C- Map Commercial, 133 Falmouth Rd, Mashpee, MA 02649
Chartco, New North Road, Hainault, Ilford Esex 166 2UR, UK
Electronic Marine Systems, 800 Ferndale Pl, Rahway, NJ 07065
Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607
Hose-McCann Telephone Company, 1241 W. Newport Center Drive, Deerfield Beach, FL 33442, 954-429-1110, 954-429-1130, mchip@hosemccann.com
Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-185'
Transas Marine USA, 19105 36th Ave, W., Ste, 101, Lynwood, WA 98036-5760

NAVAL ARCHITECTS, MARINE ENGINEERS
A.K. Suda, Inc., 3004 19th St., Metairie, LA 70002-4989
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
Band, Lavis, & Associates, Inc., 900 Ritchie Hwy, Suite 203, Severna park, MD 21146
Bay Engineering, 253 N. First Ave., Sturgeon Bay, WI 54235
C. Baxter & Associates, P.O. Box 9006, Mobile, AL 36609
CDI Marine Co., 9550 Regency Square Blvd, Ste 400, Jacksonville FL 32222
Computer Sciences Corporation-Advance Marine Center, 1201 M St. SE., Washington, DC 20003
CT Marine, 56 Crooked Trail, Rowayton, CT 06853
Cunningham & Walker, 1762 Providence Hollow Lane Jacksonville, FL 32223
Dejong & Lebet, Inc., 1734 Emerson St., Jacksonville, FL 32207
Elliot Bay Design Group, 5301 Shishole Ave, NW, Ste 200, Seattle, WA 98107
George G. Sharp, 100 Church St., New York, NY 10007
GTR Campbell Marine, 24 Lambton Street, Ormstown, Quebec JOS 1AO, Canada
Guido Perla & Associates, 4300 King St., Ste 1200, Seattle, WA 98104
Jamestown Marine Service, 1084 Shennecossett Rd., Groton, CT 06340
John J. McMullen Associates, 4300 King St., Suite 400, Alexander VA 22302
John W. Gilbert & Assoc., 199 State St., Boston, MA 02109
Kvaerner Masa Marine Inc., 201 Defense Highway, Ste 202, Annapolis, MD 21401
M. Rosenblatt & Son, Inc., an AMSEC LLC Operation, 1201 M Street, S.E., Suite 020, Washington, DC 20003
Maritech, Seacliff, Bay Road, Newmarket, NH 03857
MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626
McElroy Machine & Mfg Co., Inc, P.O. Box 4454, Biloxi, MS 39535-4454
MIL Systems, 200-1150 Morrison Drive, Ottawa, Ontano K2H 8S9, Canada
Nautical Designs, Inc., 2101 S. Andrews Ave., Ste 202, Fort Lauderdale, FL 33316
R.J. Mellusi & Co., 71 Hudson St., New York, NY 10013
Sargent & Herkes, 225 Baronne St., STe 1405, New Orleans, LA 70112
Scientific Marine Services, Inc., 101 State Pl., Ste F., Escondido, CA 92029
Sea School, 10812 Gandy Blvd, St. Petersburg, FL 33702
Seaworthy Systems Inc., PO Box 965, Essex, CT 06426
The Glosten Associates Inc., 600 Mutual Life Bldg, 605 First Ave., Seattle, WA 98104
VUYK Engineering, P.O. Box 204, , 9700 AE Groningen, Netherlands
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544

NAVIGATION
ComNav Marine Ltd., 13511 Crestwood Pl., Ste 15 15, Richmond, BC V6V 2G1, Canada
D & B Technologies, 1458 OCEAN SHORE BLVD #132, ORMOND BEACH, FL 32176-3613
Klein Navigation, 11 Klein Drive, Salem, NH 03079, 603 890-1304, 603 890-9796, mail@kleinnavigation.com, Contact: Deborah Durgin, www.kleinnavigation.com
Nauticast AG, Mariahilfer Strasse 50/211, A-1070 Vienna, Austria
Transas Marine USA, 19105 36th Ave. W., Ste. 101, Lynwood, WA 98036-5760

NOZZLES/ NOZZLE SYSTEMS
Harrington Marine, 6720 124th Ave., Fennville, MI 49408
Nautican, 115 Kelvin Grove Way P.O. Box 428, Lions Bay, BC VON 2E0, Canada, 604-921-1920, 604-921-1925, josip@nautican.com, Contact: Josip Gruzling, www.nautican.com

OIL/WATER SEPARATORS
Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
MMC International, 60 Inip Dr, Inwood, NY 11096
Westfalia Separator, Inc., 100 Fairway Court, Northvale, NJ 07647, (201) 767-3900, (201) 784-4399, brown.courtney@wsus.com, Contact: Courtney Brown

PAINTS AND ANTI FOULANTS
E Paint Company, 25 Research Road, E. Falmouth, MA 02536, 800-258-5998, 508-495-3210, epaint@epainf.net, Contact: Kimberly Fontaine, www.epaint.net
New Coat Technology, LLC, P.O. Box 130 228, Houston, TX 77219, 713-223-4370, 713-523-4606, sales@newcoattech.com

PARTS LOCATOR SERVICE
Inventory Locator Service, 3965 Mendenhall Rd., Memphis, TN 38115

PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS
GS-Hydro U.S., 1395 Bluehills Ave., Bloomfield, CT 06002
Jesse Engineering, 5225 7th St., E. Tacoma, WA 98424, 253-922-7433, 253-922-2536, tmorgan@jesse-wallace.com
Neptune Research, 1685 Latham Rd., West Palm Beach, FL 33409
RAMCO Manufacturing Co., 365 Carnegie Ave., Kenilworth, NJ 07033

PIPE LEAK REPAIR
CSD North America, 880 Candia Rd., Unit 10, Manchester, NH 03109

PNEUMATIC LINE THROWERS
Restech Norway A/S, Box 624, NO-8001 BODO, Norway

PORT DEVELOPMENT
RTM Star Center, 2 W. Dixie Hwy, Dania, FL 33004
Sasakura Engineering, 7-32 Takeshima, 4-Chome, Nishiyodogoaw KY Osaka555, Japan

PORT SECURITY
Foss Environmental, P.O. Box 3535, Seattle, WA 98124

PORTABLE FOAM APPLICATORS
IMSSCO Corporation, 2040 Harbor Island Drive, Ste. 201 A, San Diego, CA 92101

PORTABLE VENTILATORS
Americ Corp, 1910 E. Devon Ave., Elk Grove Village, IL 60007

PRECISION FLAME CUTTING/SAWING
Ronson Technical, 2146 B Flintstone Dr., Tucker, GA 30085

PREVENTATIVE MAINTENANCE
Marine Safe Electonics, 261 Milway Ave, #12, Concord, Ontario L4K 4K9, Canada

PROPULSION EQUIPMENT
ABB Turbocharger, Inc., 1460 Livingston Ave., North Brunswick, NJ 08902
Alstom Power Conversion, 3 Ave, Des Trois Chenes, 90018 Belfort Cedex, France
Brunvoll A/S, P.O. Box 370, N-6401 Molde, Norway
Caterpillar, Inc., P.O. Box 610, Mossville, IL 61552-0610
Cummins Marine, 4500 Leeds Ave., Ste 301, Charleston, SC 29405
CWF Hamilton Co., P.O. Box 709, Christchurch, New Zealand
Fincanten, Diesel Engine Div., GMT, Bagnoli della, Rosandra 3334 Trieste, Italy
Harbormaster Marine, Inc., 31777 Industrial Rd., Livonia, MI 48150
Karl Senner Inc., 25 W Third, Kenner, LA 70062
Kawasaki Heavy Indust., World Trade Center Bldg., 4-1 Hamamastu-cho, 2-chome, Minato-ku Tokyo 105-6116, Japan
LA.ME Srl. Marine Division, Via della Fornace 4, Opera (MI), Italy
Man B&W Diesel, 17 State St., NY, NY 10004
Man B&W Diesel A/S, Telgtholmsgade 41, Copenhagen SV DK-2450, Denmark
Man B&W Diesel AG, Stadtbachstrasse 1, Augsberg D-86153, Germany
Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478
Napier Turbochargers, P.O. Box 1, Waterside, South Lincoln LN5 7FD, UK
Nya Berg Propulsion AB, Box 1005, 430 90 Ockero, Sweden
Propulsion Systems Inc, 601 NE 26th Court, Pompano Beach, FL 33064
Rolls-Royce Commercial Marine, 10255 Richmond Ave., Ste 101, Houston, TX 77042
Schottel Gmbh & Co., KG-Mainzer Strasse, 99-D-56322-Spay, Germany
Schottel Inc., 675 Industrial Blvd., Sugar Land, TX 77478
Voith Schiffstechnik GMBH & Co., P.O. Box 2011, 89510 Heidenheim, Germany
Wartsila Corporation, Box 244, FI-65101 Vasa, Finland
Wartsila Lips, 3617 Koppens Way, Chesapeake, VA 23323
ZF Marine, 3131 S.W. 42nd St., Ft. Lauderdale, FL 33312, 954-581-4040, 954-581-4078, www.zf.com, Contact: A.J. Halavacs, www.zf-marine.com
ZF Marine Group, Ehlerst. 50, 88046 Friedrichshafen, Germany

PROPULSION MONITORING
Azonix-Dynalco, 3690 NW 53rd St., Ft. Lauderdale, FL 33309

PUBLICATIONS

Maritime Reporter, 118 East 25th street, New York, NY 10010, 212 477 6700, 212 254 6271, jomalley@marinelink.com, Contact: John O'Malley, www.marinelink.com

PUMP-REPAIR-DRIVES
Fybroc-Div.of Met-Pro, P.O. Box 144, Harleysville, PA 19438
Reagan Equipment, 2550 BelleChase Hwy, Gretna, LA 70054
Scardana Americas Bkg., 502 Empire St. , Greenfield Park J4V 1V7, Canada

RADARS-ARPAS
Ampco Pumps Co., 4424 West Mitchell St, Milwaukee, WI 53214
Beier Radio, 1990 Industrial Ave, Harvey, LA 70058
Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607

RADIATION DETECTION
Thermo Electron, 6801 Cochran Rd., Solon, OH 44139

REMOTELY OPERATED VEHICLES
VideoRay LLC, 415 Engleview Blvd., Exton, PA 19341

REVERSE OSMOSIS
G.E.T. Inc., 3135 Golden Ave., Long Beach, CA 90806

RIGID INFLATABLE BOATS
Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806
Wing Inflatables, P.O. Box 279, 1132 Samoa Blvd., Arcata, CA 99521

ROPE-MANILA-NYLON-HAWSERS-FIBERS
Marlow Ropes, South Road, Halisham, East Sussex BN27 3JS, UK
Puget Sound Rope, 1012 Second Ave., Anacortes, WA 98221

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

RUDDER BEARINGS & BUSHES
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234
Orkot Composites, 2535 Prairie Rd, Unit D., Eugene, OR 97402

SAFETY MANAGMENT CONSULTANTS
Modern Maritime, 67 Bow St., Ste. 3, Portsmouth, NH 03801

SAFETY PRODUCTS
Brookdale International, 1--8755 Ash St., Vancouver, BC V6P 6T3, Canada
D & B Technologies, 1458 OCEAN SHORE BLVD #132, ORMOND BEACH, FL 32176-3613, 407-647-7500, 407-647-7505, HOTEYE@HOTEYENOW.COM
DBC Marine Safety Systems, 101-3760 Jacombs Rd , Richmond, BC V6V 6T3, Canada
FabEn Co., Inc., 2012 Karbach, Houston, TX 77092
Lalizas SA, 21 Haidariou St , 545 Piraeus, Greece
SlipNOT Metal Safety Floorings (Div. of W.S. Molnar Company), 2545 Beaufait St., Detroit, MI 48207
Steams Mfg. Co., PO Box 1498, St. Cloud, GA 56302-1498
Thordon Bearings Inc., 3225 Mainway, Burlington, Ontario L7M 1A6, Canada
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136
Walport USA , 39-5A Dover Rd South, Toms River, NJ 08757

SALVAGE
Titan Maritime Industries Inc., P.O. Box 350485, Ft. Lauderdale, FL 33004

SANITATION DEVICE- POLLUTION CONTROL
Envirovac Inc, 1260 Turret Dr., Rockford , IL 61111
EVAC Environmental Solutions, 1260 Turret Dr., Rockford , IL 61111
FAST®Systems, 8229 Brentwood Industrial Drive, Brentwood, MO 63144, 314-645-6540, 314-645-6131, solutions@marinefast.com, Contact: Alan Fleischer, www.marinefast.com
Headhunter Inc., 3380 SW 11th Ave., Ft. Lauderdale, FL 33315
Hydroxl Systems, 9800 McDonald Park Rd, Sidney, BC V8L 3S8, Canada
Microphor, 452 E. Hill Rd., Willits, CA 95490
Research Products-INCINOLET, 2639 Andjon Drive, Dallas, TX 75220, 800-527-5551, 214-350-7919, sales@incinolet.com
Sanitary For All, Inc., 3909 Witmer Rd., PMB 472, Niagra Falls, NY 14305

SATELLITE COMMUNICATIONS
Beier Radio, 1990 Industrial Ave, Harvey, LA 70058
Eurocom Industries AB, Box 7071, DK-9200 Aalborg SV, Denmark
Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607
KVH Industries Inc., 50 Enterprise Center, Middletown , RI 02842
Land Sea Systems, 509 Viking Drive, Suites K,L,M, Virginia Beach, VA 23452
Nera Satcom AS, Box 91, NO-1375 Billingstad, Norway
Stratos , 1501 Metcalfe St, Ste 1900, Ottawa, Ontario K2P 1P1, Canada
Thrane & Thrane A/S, Lundtoftegardsvej 93D, DK-2800 Lyngby, Denmark

SCARIFIERS
Desmond-Stephan, P.O. Box 30, Urbana, OH 43078

SEALS
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234
Kobelco Marine, Inc., 366 Fifth Avenue, Suite 312, NY, NY 10001, 212-967-5575, 212-967-6966, hawkins@kobelcomarine.com
Orkot Composites, 2535 Prairie Rd, Unit D., Eugene, OR 97402

SEATING
H.O. Bostrom, 818 Progress Ave., Wankesha, WI 53186

SECURITY BARRIERS
Seaward International, P.O. Box 98, Clearbrook, VA 22624

SECURITY CONSULTANTS
Solutions Group, 9663 Santa Monica Blvd. Ste 175, Beverly Hills, CA 90210, 877-844-8744, 877-844-8744, sginternational.net, Contact: Michael Duffy, www.solutionsgroupinternational.com

SENSORS
Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065

SHAFT SEALS
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234

SHAFT/BORE ALIGNMENT TOOLS
Ludeca, Inc., 1425 NW 88th Ave, Miami, FL 33172

SHAFTS
Geislinger Corporation, 200 Geislinger Drive, Battle Creek, MI 49015

SHEAVES
Skookum , P.O. Box 280, Hubbard, OR 97032

SHIP DISPLAYS
Data Modul, 1767-46 Vets Memorial Highway, Islandia, NY 11749

SHIP LIFTS
Synchrolift Inc., Two Datran Center, 9130 S. Dadeland Blvd , Miami, FL 33156-7850

SHIP MANAGEMENT
Eurasia Group , 22A Floor Chinachem Exchange Sq., , 1 Hoi Wan St., Quarry Bay, Hong Kong

SHIP REPAIR
Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates
GMD Shipyard, 360 Front St., Staten Island, NY 10304
GS-Hydro U.S., 1395 Bluehills Ave., Bloomfield, CT 06002
United Marine Enterprises Inc., P.O. Box 22077, Beaumont, TX 77720

SHIP SIMULATORS
Kongsberg Maritime Ship Systems AS, PO Box 1009, 3194 Horten, Norway

SHIPBUILDING-REPAIRS, MAINTENANCE, DRYDOCKING
Allen Marine, P.O. Box 1049 , Sitka, AK 99835
Atlantic Marine, Inc., P.O. Box 3202 , mobile, AL 36652
Atlas Metal Sales, 1401 Umatilla St., Denver, CO 80204
Austal USA, 100 Dunlap Dr., Mobile, AL 36633
Blount Marine, 461 Water St., Warren, RI 02885
Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374
Curacao Drydock Co., Box 3012 , Wilmestad, Curacao, Netherlands Antilles
Damen Shipyards, P.O. Box 1 Gorincherr, 4200AA Holland, Netherlands
Detyens Shipyards Inc., 1670 Drydock Ave., Bldg 236, North Charleston, SC 29450
Eastern Shipbuilding Group, 2200 Nelson St., Panama City , FL 32402
Fincantieri Canterieri Navali Italiani Spa, Merchant Shipbuilding Div., 34123 Trieste, Italy
Gladding Hearn, 1 Riverside Ave., Somerset , MA 02725
GTR Campbell Marine, 24 Lambton Street, Ormstown, Quebec JOS 1AO, Canada
Horizon Shipbuilding Inc., 13980 Shell Belt Rd., Bayou La Batre, AL 36509
In-Place Machining, 1929 N . Buffum St, Milwaukee, WI 53212
Leevac Industries, LLC, P.O. Box 1190, Jennings, LA 70546
Mariso USA, Inc., 100 Davidson Ave., Somerset, NJ 08873
Motor-Services AB, Box 2115 , Ronninge S- 144 04, Sweden
Newport News Shipbuilding, 4101 Washington Ave., Newport News , VA 23607
United Defense, 1525 Wilson Blvd., Ste 700, Arlington, VA 22209-2444
United Marine Enterprises Inc., P.O. Box 22077, Beaumont, TX 77720
VT Halter, PO Box 3029, Gulfport, MS 39505
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544
Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806

SHIPYARDS
Alabama Shipyard, P.O. Box 3202, Mobile, AL 36652
Allen Marine, P.O. Box 1049 , Sitka, AK 99835
Atlantic Marine, Inc., P.O. Box 3202 , mobile, AL 36652
Bollinger Shipyards, 8365 Hwy 308 South, Lockport, LA 70374, 985 532-2554, 985 532-7225, RobertS@bollingershipyards.com, Contact: Robert A. Socha, www.bollingershipyards.com
Derecktor Shipyard, 311 E. Boston Post Rd., Mamaroneck, NY 10543
Detyens Shipyards Inc., 1670 Drydock Ave., Bldg 236, North Charleston, SC 29450
GMD Shipyard, 360 Front St., Staten Island, NY 10304
Leevac Industries, LLC, P.O. Box 1190, Jennings, LA 70546
Offshore Inland, 3521 Brookdale Dr S., Mobile, AL 36618
United Defense, 1525 Wilson Blvd., Ste 700, Arlington, VA 22209-2444

SILENCERS
EM Products, 5380 Cottonwood Lane, Prior Lake, MN 55372, (952) 440-9200, (952) 440-3400, sales@zerostart.com
Silex Inc., 6659 Ordan Dr., Mississauga, ON L5T 1K6, Canada

SIMULATION TRAINING
Marine Safety International, Marine Terminal , Laguardia Airport, NY 11371
Maritime Institute of Technology, 5700 Hammonds Ferry Rd., Linthicum Heights, MD 21090
Poseidon Simulation AS, Box 89, NO-8370 Leknes, Norway
Transas Marine Overseas Ltd., 12 Obukhovskoy, Oboroni, St. Petersburg 193019, Russian Federation

SKILLED LABORERS
Ameri-Force Inc., 3266 Talleyrand Ave., Jacksonville, FL 32206
MK Production Resources Inc., 1610 Reynolds Street, Brunswick, GA 31520

SLIDING DOORS
Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

SOFTWARE
Autoship Systems Corp., Suite 312-611 Alexander Street, Vancouver, BC V6A 1E1, Canada, 604-254-4171, 604-254-5171, sales@autoship.com, Contact: Brigden Henry, www.autoship.com
Creative Systems Inc., P.O. Box 1910, Port Townsend, WA 98368
Loadmaster International , St. Varvsgarten 11B SE, 211 19 Malme, Sweden
Resergence Software Inc ., 2021 Lakeshore Dr., Ste 21D, New Orleans, LA 70122

STEERING GEARS/ STEERING SYSTEMS
A. Van der Velden B.V., Dorpsstraat 67a, PO Box 2061, 2930 AB Krimpen a/d Lek, Netherlands
CS Controls Inc, 101 Dickon Road, Houma, LA 70363, 985-876-6040, 985-876-0751, info@cscontrols.com, Contact: Paul Srigley, www.cscontrols.com
Kobelt Manufacturing Co., Ltd., 8238-129 Street, Surrey, BC V3W0A6, Canada
Offshore Inland, 3521 Brookdale Dr. S., Mobile, AL 36618

STERN TUBE BEARINGS/ BUSHES
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234
Orkot Composites, 2535 Prairie Rd, Unit D., Eugene, OR 97402
Thordon Bearings Inc., 3225 Mainway, Burlington, Ontario L7M 1A6, Canada

STERN TUBE SEALS
Superbolt, PO Box 683, Carnegie, PA 15106

STRAINERS
Hellan Strainer, 3249 East 80th St., Cleveland, OH 44104

SUN PROTECTION SYSTEMS
Solar Solve Marine, 7 St. Hilda Industrial Estate, South Shields NE33 1RA, UK, +44 191 454 8595, +44 191 454 8692, info@solasolv.com, Contact: Paul Hopkins, www.solasolv.com

SURFACE PREP TOOLS
Aurand Mfg., 1210 Ellis St., Cincinnati, OH 45223
Flow International Corp., 23500 64th Ave., South Kent, WA 98059, 800-446-3569, 253-813-9377, mbest@flowcorp.com
Flow International Corp , 23500 64th Ave., South Kent, WA 98059
NLB Corp., 29830 Beck Road, Wixom, MI 48383, 248-624-5555, 248-624-0908, nlbmktg@nlbusa.com, Contact: Jenna Eads, www.nlbcorp.com
Schmidt, PO Box 37, Fresno, TX 77545
Ultrastrip Systems Inc., 3515 SE Lionel Terrace, Stuart, FL 34997, 772-287-4846, 772-781-4778, sales@ultrastrip.com, Contact: John Odwazny, www.ultrastrip.com

SURVIVAL EQUIPMENT
Brookdale International, 1--8755 Ash St., Vancouver, BC V6P 6T3, Canada

TANK LEVELING INDICATORS
Ian Conrad Bergan, 3119 North Davis Highway, Pensacola, FL 32503, 850-434-1286, 850-434-1246, sales@icbergan.com, Contact: Ron Monell, www.icbergan.com
King Engineering Co, PO Box 1228, Ann Arbor, MI 48106
Kockum Sonics LLC, 933 Industry Road, Suite 105, Kenner, LA 70062
Saab Marine Electronics, Box 13045, 402 5Goteborg, Sweden
Technical Marine Services, 6040 North Cutter Circle, Portland, OR 97217

TEAK DECK SEALANT
Boatlife Industries, 2081 Bridgeview Drive, N. Charleston, SC 29415, 800-382-9706, 843-566-1275, Contact: Louise Schmidt

TESTING SERVICES
Wyle Laboratories, 7800 Govern's Dr, S.W., Huntsville , AL 35807

THRUSTER SYSTEMS
Thrustmaster of Texas, Inc., 12227 FM-529, Houston, TX 77041, 713 937-6295, 713 937-7962, info@thrustmastertexas.com, Contact: Bert Ault, www.thrustmastertexas.com

TRAINING
International Maritime Training, 910 SE 17th St., Ste 200, Fort Lauderdale, FL 33316
USMMA- Global Maritime and Transportation School, 300 Steamboat Rd., Kings Point, NY 11024

TRANSMISSIONS
Karl Senner Inc., 25 W Third, Kenner, LA 70062

TRAVEL SERVICES
Travel Services Unlimited, 200 Golden Oak Court, Suite 120, Virginia Beach, VA 23452

TURBOCHARGERS
ABB Turbo Systems AG, CH 5401, Baden, Switzerland

TURBOCHARGERS- REPAIRS
Motor-Services Hugo Stamp, 3101 S.W. 3rd Ave., Ft. Lauderdale, FL 33315
Napier Turbochargers, P.O. Box 1, Waterside , South Lincoln LN5 7FD, UK

ULTRA HIGH MOLECULAR WEIGHT MARINE FENDERING
Ultra Poly, Inc., 2926 So.Steele Street, Tacoma, WA 98409

ULTRASONIC TESTING
M.A.C.E, 5910 NE 15th Ave., Fort Lauderdale, FL 33331

ULTRATHIN (UHMW) NON-SKID DECKING
Ultra Poly, Inc., 2926 So.Steele Street, Tacoma, WA 98409

UNDERWATER SURVEILLANCE SONAR
C-Tech LTD, P.O.Box 1960, Cornwall Ontario K6H6N7, Canada

VACUUM EQUIPMENT
Industrial Vacuum Equipment Corporation, N8091 Maple Street, Ixonia, WI 53036, 800-331-4832, 920-261-7117, randy@industrialvacuum.com

VACUUM TOILET SYSTEM
Envirovac Inc, 1260 Turret Dr., Rockford , IL 61111
Jets Vacum Sewage System, P.O. Box 14, N-6060 Hareid, Norway

VALVES
Norriseal, P.O. Box 40525, Houston, TX 77240, 713-466-3552, 713-896-7386, sales@norriseal.com, Contact: Gordon Dorr, www.norriseal.com

VALVES & FITTINGS
Leslie Controls, 12501 Telecom Dr., Tampa, FL 33637

VENTILATION SYSTEMS / PRODUCTS
Delta T Systems, PO Boxj9159, Jupiter, FL 33468
Dry Air Technology, 313 North Oak St., Burlington, VA 88233
Jon M. Liss Associates, PO Box 5005-73, Rancho Santa Fe, CA 92067

VIBRATION ANALYSIS
Ludeca, Inc., 1425 NW 88th Ave, Miami, FL 33172
Maritech, LLC, 100 Powermill Rd., Acton, MA 01725

VIBRATION CONTROL PRODUCTS
Lo-Rez Vibration, 186 W. 8th Ave. , Vancouver, BC V5Y 1N2, Canada, 604-879-2974, 604-879-6588, lo-rez@lo-rez.com, Contact: Ted Spaetgens, www.lo-rez.com

VISCOMETERS
Cambridge Applied System, 196 Boston Ave. , Medford, MA 02155

VOYAGE DATA RECORDERS
Rutter Technologies, P.O. Box 23150, Churchill Park Postal Outlet, St. John's, NL A1B 4J9, Canada

WASTE WATER TREATMENT
Airvac, 4217 N. Old U.S. 31, Rochester, IN 46975
EVAC Environmental Solutions, 1260 Turret Dr., Rockford , IL 61111, 815-654-8300, 815-654-8306, sfredrick@evac.com
FAST®Systems, 8229 Brentwood Industrial Drive, Brentwood, MO 63144, 314-645-6540, 314-645-6131, solutions@marinefast.com, Contact: Alan Fleischer, www.marinefast.com
RWO , Leerkampe 3, D- 28259 Bremen, Germany
ZNC International Incorporated, 200 William Street , Port Chester, NY 10573, 800-552-4403 / 914-690-0650, 914-690-0653, Chris@znclink.com, Contact: Chris Zimmerman, www.znclink.com

WATER JET CLEANING
Flow International Corp., 23500 64th Ave., South Kent, WA 98059
Gardner Denver Water Jetting Systems, 8807 Emmett Rd., Ste 100, Houston, TX 77040
NLB Corp., 29830 Beck Road, Wixom, MI 48383

WATER PURIFIERS
Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Gardner Denver Water Jetting Systems, 8807 Emmett Rd., Ste 100, Houston, TX 77040
Pentair Water Treatment, 502 Indiana Avenue, SheBoygan, WI 53081, 866-873-7506, 866-203-7361, customerservice@plymouthwater.com
Reverse Osmosis of South Florida, Inc., 150 S.E. 29th St., Fort Lauderdale, FL 33316, 954-462-4114, 954-467-6080, sales@desalinator.com

WATERTIGHT CLOSURES
Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

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ESAB Welding and Cutting Products, 411 S. Ebenezer Rd. PO Box 100545, Florence, SC 29501, 843-664-4411, 843-664-4258, dterry@esab.com, Contact: Donna Terry, www.esabna.com
Integro, 290 Pratt Street, Meriden, CT 06450

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Coastal Marine Equipment, Bldg 9114 MISAAP Ind. Complex, Stennis Space Center, MS 39529
Coastal Marine Equipment Inc., BLDG. 9114 MISAAP Industrial Complex, Stennis Space CTR., MS 39529, 228-813-1700, 228-813-1709, sales@coastalmarineequipment.com, Contact: Ralph Waguespack, www.coastalmarineequipment.com
CS Controls Inc, 101 Dickon Road, Houma, LA 70363, 985-876-6040, 985-876-0751, info@cscontrols.com, Contact: Paul Srigley, www.cscontrols.com
Intercontinental Engineering , PO Box 9055 , Kansas City, MO 64168
Jeamar Winches, 1051 Clinton St., Buffalo, NY 14206
Markey Machinery, P.O. Box 24788, Seattle, WA 98124
McElroy/Catchot Winch Company, Inc , P.O. Box 4632, Biloxi, MS 39535-4632
MMC International, 60 Inip Dr, Inwood, NY 11096
Patterson Company, 3 Riversea Roads, Pittsburgh, PA 15233, 800-322-2018, 412-322-2785, info@wwpatterson.com
Smith Berger Marine, 7915 10th Ave. S., Seattle, WA 98108
Superior Lidgerwood Mundy, 1101 John Ave., Superior , WI 54880
Timberland Equipment Ltd & Almon Johnson, 459 Industrial Ave., Woodstock, ON N4S 7Z2, Canada

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Jered Industries, 1608 Newcastle St., Brunswick, GA 31520

WINDOWS
Deansteel Mfg., 111 Merchant St., San Antonio, TX 78204

WINDSCREEN & WINDOW WIPERS
Bae Systems, 550 South Fulton St., Mt. Vernon, NJ 10550
Hepworth Marine International , Hepworth House, Brook St., Redditch, Worcestershire B98 8NF, UK
Wynn Marine, Ltd., Wynn House, Lansdown Estate,Cheltenham, Gloucestershire, UK

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Products

ABB

The Compact Azipod System is a podded propulsion system that provides azimuthing angles. It incorporates a permanent magnet synchronous motor and a fixed-pitch propeller, which is directly mounted on the motor shaft. A low voltage frequency converter controls the electric motor. The system provides full power in all directions.

Circle 101

Cooper

The Cooper Z-line Marine Propulsion Bearings with jacking screws is designed to solve propulsion shafting alignment problems. It features jacking screws to make for efficient installment alignment; SLUB to maintain shaft alignment during hull flexing; and temperature and vibration probe drilling to allow for fitting of monitoring equipment.

Circle 102

Beele

Beele Engineering has introduced a firesafe temporary seal that can be used in both building construction and in shipbuilding. The temporary seal consists of sheets of fire-resistant Actifoam foam rubber, which is readily compressible. The foam rubber sheets can be quickly and simply rolled or folded up, after which rhey can be used to close off the penetration opening.

Circle 103

Coastal Marine Equipment

Coastal Marine Equipment's Anchor Windlasses are supplied with catheads, lever operated jaw clutches and hand wheel operated band brakes. All Anchor Windlasses are available in electric or hydraulic drive and can be supplied constant speed, multi-speed and variable speed. Hydraulic drives operate off central hydraulic system or dedicated system supplied with unit.

Circle 104

Duramax

Industrial Bearings are ideal for pump installations where bearings are submerged or where water can be piped for lubrication. They are available for centrifugal, horizontal and vertical applications. Specially formulated polymers resist chemical corrosives and abrasives and absorb heavy impacts.

Circle No. 105

Fernstrum

The R.W. Fernstrum Gridcooler keel coolers aim to provide efficient quality and ease of installation. It is available in standard as well as many custom configurations to accommodate installation and maintenance concerns. The Gridcooler can be mounted almost anywhere on a ship's hull, giving the flexibility to match the installation to the hull design and operating conditions of any boat.

Circle 106

John Crane Lips

John Crane Lips builds a wide range of propulsion systems; from small monoblock fixed pitch propellers (FPP) to the most sophisticated types of propulsion systems available on the market today. This includes state-of-the-art controls as required on modern cruise vessels and semi-submersible drilling as well as on production rigs.

Circle 107

Kiene

Kiene indicator valves are available for most diesel engines. They are designed to "close with and open against engine pressure". This ensures that the valve will not vibrate open. Kiene valves are time-proven, durable and compact. Kiene valves are simple, reliable all-steel design; allows compression and firing pressure testing; required for engine performance and monitoring instruments and easy to install.

Circle 108

MAN B&W

The Service Center Denmark operates from two locations: Holeby, in the southern and Frederikshavn in the northern part of Denmark. These locations form a 'local' full-service MAN B&W setup for Scandinavian customers and vessels in the North Sea/Baltic service. The Frederikshavn offers ship service, re-engining expertise and major repair tasks on all propulsion and auxiliary machinery on board various commercial vessels.

Circle 109

Nauticast

A specialist in AIS technologies, Austrian based Nauticast AG introduced the X-Pack DS, a mobile Class A AIS unit, which was among the first systems to receive BSH Wheelmark (EC) type approval, and holds worldwide approvals by the U.S. Coast Guard, FCC, CCS (China Classification Society) and many others.

Circle 110

Lubmarine

Lubmarine's Talusia HR offers a range of high technology lubricants which were developed to provide unrivalled in-service performance. This range of lucbricants has been specially designed to ensure minimal piston ring and liner wear. The safety margins of each property of these lubricants have been chosen using mathematical models developed by Lubmarine.

Circle 111

Van der Velden

Van der Velden Marine Systems designs and manufactures rudder and offers solutions for every type of vessel. The rudders are developed for the needs of modern vessels, where each solution offers a unique combination of course stability and maneuvering performance. Their portfolio also includes passarelles, specifically designed marine cranes, side boarding ladders and bowthrusters.

Circle 112

Vickers

Vickers have now developed biodegradable versions of their specialized sterntube oils. These new products, the Hydrox Bio 68 (Seatrade Award Winner 2003), Hydrox Bio 220 and Hydrox Bio 100 are of low toxicity to marine life including fish and shrimp. They are stocked worldwide.

Circle 113

Hammar

C.M.Hammar AB has launched a new electronic remote release system (ERRS) for life rafts, evacuation systems or other lifesaving appliances. The new electrical ERRS is designed for quick and efficient evacuation of passengers. It is operated via an electronic control panel that activates one or several electric Hammar H20 Remote Release Units.

Circle 114

Wynn

Traditional wiper control systems run on an analogue basis but the digital nature of the Series 3000 Network Control system makes it a far more powerful utility. Among the many features, the Series 3000 has a LCD console mount control panel, modular systems that offer full flexibility and full wiper control including integral wash and air purge.

Circle 115

Craft Bearing

Craft Split Roller Bearings are becoming the industry standard in the marine industry. Our standard product line is available from 1 7/16 - 32 in. Their bearing continues to have a successful track record in propulsion shafting, deck machinery, mooring winches, fans, conveyors and thrusters. Metric and special design bearings are available upon request.

Circle 116

Schottel

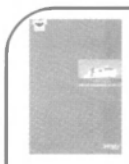
Schottel's versatile L-drive Thruster accepts either horizontal or vertical drive applications, which optimizes prime mover location and ensures economical, space-saving installation. L-drives are directly coupled to the drive of the prime mover, with power transmitted via a single pair of bevel gears to the propeller.

Circle 117

GE

GE Transportation Systems has integrated its Marine & Stationary Power component into its portfolio of product offerings. The range of GE Diesel medium speed engines includes 12V and 16V cylinder configurations ranging between 2,500 - 4,100 horsepower.

Circle 118



Viking

Viking produces lifesaving equipment that is certified according to the international quality standard DS/EN ISO 9001. Viking now produces an automatically self-righting liferaft for 150 persons. The size of the liferaft represents the absolute limit so far prescribed by the authorities in terms of liferaft capacities.

Circle 119

Leslie Controls

Leslie Controls has released their new Steam & Thermal Fluid Controls brochure. The new brochure includes photos and descriptions for every product in Leslie's extensive line, suitable for Industrial/Commercial, Power, Process and Maritime applications.

Circle 120

Thrustmaster

Thrustmaster of Texas, Inc. is a privately-owned corporation based in Houston, Texas. Thrustmaster manufactures marine propulsion equipment, including deck-mounted propulsion units, thru-hull azimuthing thrusters, retractable thrusters, tunnel thrusters, and portable DP systems.

Circle 121

Southco

Southco provides marine products, including design and color customizations to match the look and feel of your boats. Among their extensive line of products for the marine industry, Southco carries anchor and storage lockers, engine covers, glove boxes, cabinetry and instrument covers.

Circle 122

Thordon

Thordon Bearings, a the developer of pollution-free propeller shaft bearing designs, offers two solutions to the modern day problem of stern tube oil leakage. The open water lubricated propeller shaft bearing systems offer a viable alternative to conventional oil lubricated stern tube systems. Thor-Lube stern tube bearing system offers ship owners and managers an alternative to sealed, oil-lubricated stern tube systems.

Circle 123

Wartsila

Wartsila offers effective solutions to all marine power and propulsion needs. Lips CP Propellers offer efficient maneuverability, saving ship time and tug costs. For ships with frequent port calls, Lips CP Propellers is ideal for diesel mechanical plants with medium-speed eninges.

Circle 124

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Circle 125

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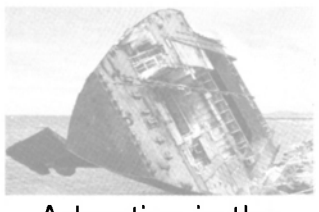

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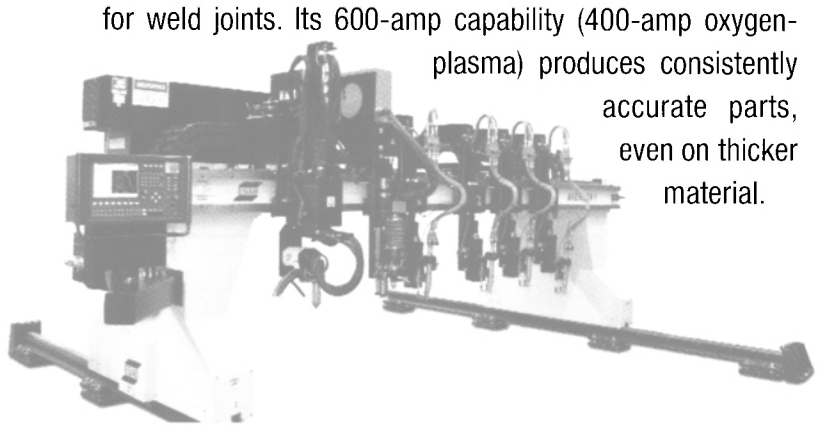

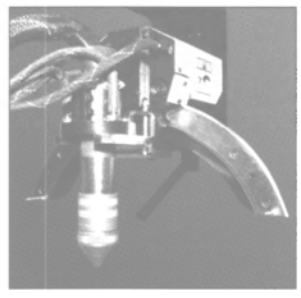

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