MARITIME REPORTER

AND ENGINEERING NEWS

Welcome Back!

In the wake of the attacks ...

USS Cole relaunched by Northrop Grumman in Pascagoula

As always, Seamen's Church and Rev. Peter Larom are there to help

U.S. Port Security tightens

A Steady Course

Design characteristics of a "Sea-Kindly" vessel

Inside the Carousel Ship

A solution for shipping compressed gas

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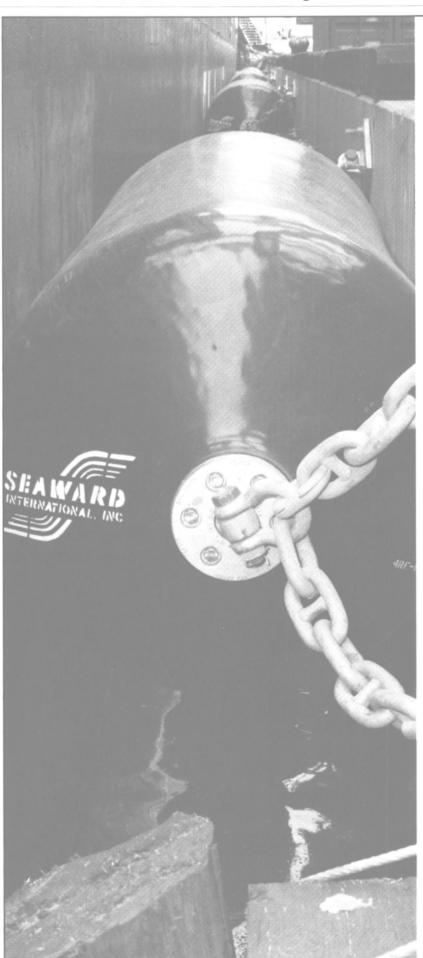
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No. 10

Vol. 63

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

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Founder:

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On the Cover: USS Cole, itself a victim of a terrorist strike, was recently re-launched by Northrop Grumman. Background, this page: The remnants of the World Trade Center complex following a terrorist strike in New York City. This picture was taken by Preston Merchant, Seamen's Church Institute.

September 11, 2001

12 Free Flow No More

Terrorist strikes in the U.S. have far reaching economic ramifications for the marine industry, starting with heightened security in U.S. Ports.

- by Charley Havner

15 SCI Lends a Hand

With a 175-year tradition of lending a hand, Seamen's Church Institute - located in lower Manhattan — provided disaster relief in the wake of the Twin Towers' collapse. — by Regina P. Ciardiello, senior edit

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A new concept for transporting compressed natural gas might just work. — by **David Tinsley**, technical editor

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Subscriptions: One full year (12 issues) \$18.00 in U.S.; outside of U.S. \$96.00 including postage and handling. For subscription information, contact: Dale Barnett, fax: (212) 254-6271; e-mail: barnett@marinelink.com

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

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

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

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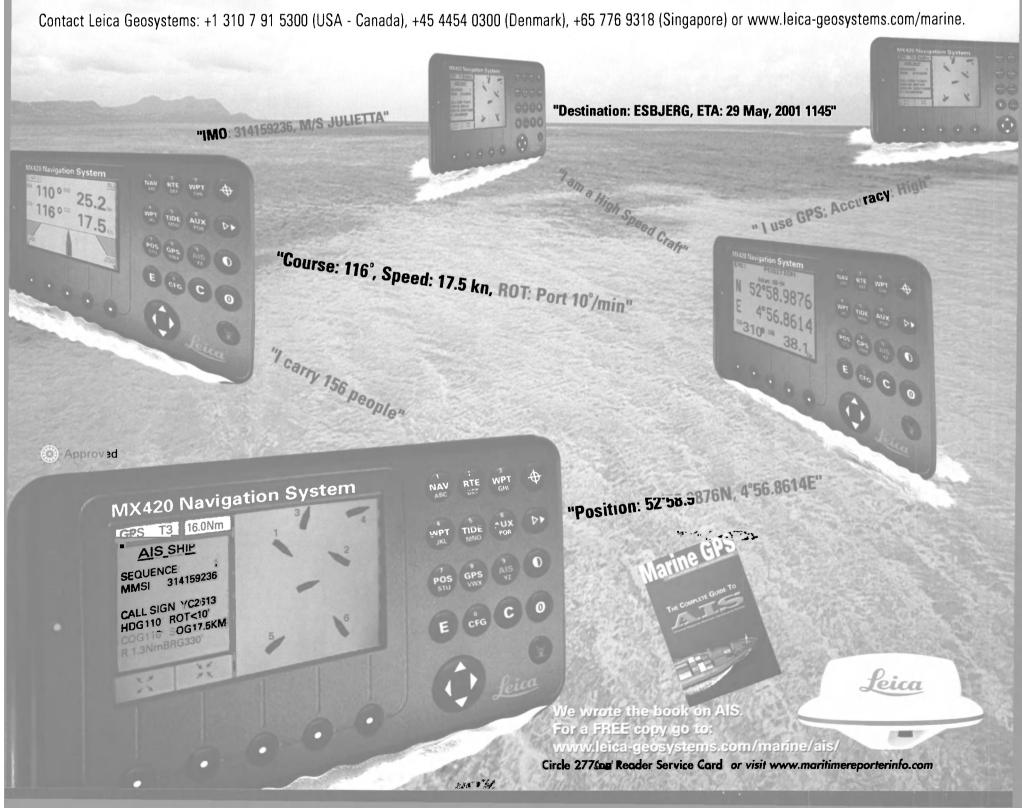
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NOL Reports First Half Profit of \$1M

The tough economic situation and business environment has not prevented Neptune Orient Line from first half profits, as the company announced \$11

million profits (albeit down 78 percent from 1H 2000 profits) on revenues of \$2.3 billion (up 6 percent from 1H 2000 revenues.)

In summarizing his company's results, **Flemming R. Jacobs,** NOL Group president and CEO, said

"We have achieved much. We came from a difficult past and we are on the right track to return to full health, but we are not there yet. We would have preferred a little more time to consolidate all we have achieved and are achieving before having to deal with a severe downturn in the economic environment like this one. We will continue our strategy, but it will take us a little longer to reach our goals."

"Today the NOL Group is clearly focused on building its three core businesses: APL, the Liner business; APL Logistics (APLL); and the tanker business, American Eagle Tankers (AET).

APL Liner

Volumes in Europe were up 14 percent and rates up 1 percent, while in Asia/Middle East rates were up three percent. These gains were undermined particularly by a significant reduction in both rates and volumes in trades touching the Americas (rates down 4 percent, volumes down 5 percent). The overall result for the first half of 2001 was a drop in APL Liner revenues of 2 percent to \$1.77 billion and a drop in Earnings Before Interest and Tax (EBIT) of 68 percent to \$31 million.

"We are in the process of rejuvenating our fleet, and the vast majority of the newbuilds are chartered in, which provides flexibility without taxing the balance sheet. We are dealing with low growth by returning other chartered in vessels to their owners as new vessels that are more cost efficient come on line," Jacobs said.

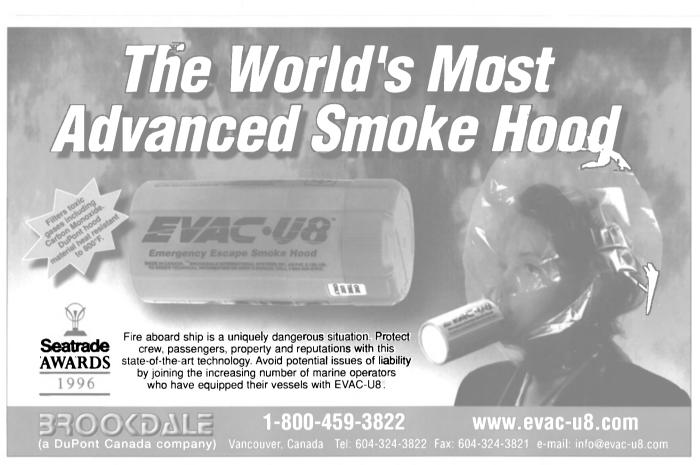
Chartering

Chartering revenues increased 24 percent to \$180 million in 1H01. EBIT rose 268 percent from \$13 million to \$48 million. "Our tanker business, American Eagle Tankers (AET), continues to be a bright spot, contributing well to both revenue and the bottom line," said Joseph Kwok, COO, CEO and president of AET and the Chartering Division.

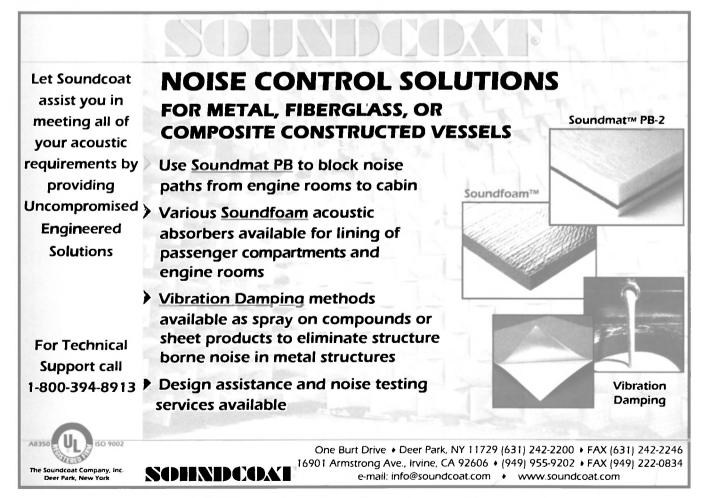
A marked improvement in Aframax crude oil tanker rates of 40 percent, from \$22,000 to more than \$30,000 per day over the same period in 2000, contributed to the improved result. "We added a further two Aframax tankers through time charter in the first half of this year, taking our fleet to 24," Kwok said. "We are on track to have an entirely double-hulled fleet as planned by 2003." None of the current fleet is single-hulled.

"We disposed of another dry bulk carrier during the first half of this year, leaving four modern Panamax bulk carriers," Kwok said. "Our intention is still to exit this business over time."

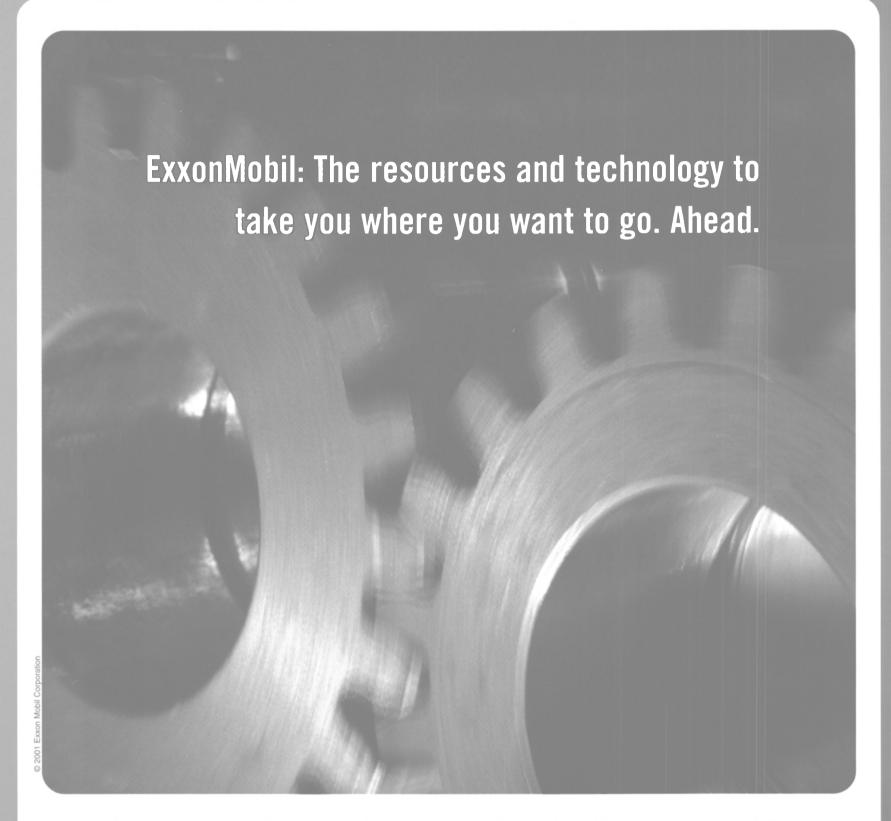
Overall, expectations for the Chartering Division for the full year are positive and better than the solid results of 2000.



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Speechless

he tragic events in New York and Washington D.C. of September 11, 2001 have left an indelible mark on the world. In the days and weeks following the terrorist attacks, millions of words, both public and private, have been spoken and written in a futile attempt to offer perspective and reason. To date, I have heard nor read none that adequately fulfill the task. In this struggle for words, I recall an excerpt from Presi-



dent Abraham Lincoln's Gettysburg Address — delivered on November 19, 1863 following a particularly pivotal battle during the American Civil War:

"The world will little note, nor long remember, what we say here, but it can never forget what they did here."

It is the job of Maritime Reporter & Engineering News to deliver perspective from the maritime industry point of view. In a gross understatement, the world is a different place today. At press time, heightened security measures in the nation's airports, ports and all borders were quickly evolving, and it can be assumed that the business of transporting goods to and from the United States will be a more lengthy, arduous and expensive task than ever before. Security, at least in the near term, will run at maximum levels. For example, the Port of New York and New Jersey has mandated, at least for now, that every ship will be escorted by two tugboats from the time the vessel enters the port complex until it reaches destination. "These may seem like extraordinary measures to members of the maritime community. These are extraordinary times," said Admiral Bennis. With security now priority one, credible carriers that run clean operations with quality, well-equipped and -maintained ships will be positioned to prosper, while those who do not will wither.

On the military side, increased spending is not an "if" or "when," rather an "on what." The Pentagon could receive up to an additional \$17 billion for the coming year, according to a report in the Wall Street Journal, driving the defense budget to the \$345 billion range. U.S. Navy spending will undoubtedly rise, but it is not yet clear if the spending will be on big ships, smaller boats, or everything in between. Given the make-up of the "new enemy," — small, elusive groups — referred to time and again by President George W. Bush, it could be reasoned that builders of medium to small, fast craft will be busy very soon.

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John Deere Offers New 300 HP Engine

John Deere Power Systems has added a new engine rating to its current line of marine engine products — the PowerTech6068SFM. The engine has an M5 rating with 300 hp (224 kW) at 2,600 rpm and is specially suited for rescue boats, pilot boats and other light-duty applications. This new heat exchanger cooled engine will incorporate a seawater aftercooler, electronically controlled fuel system, cruise-by-wire control, diagnostic messaging and self-protection.

The high-torque 6068SFM achieves constant power at a rated speed from 2,600 rpm down to 2,300 rpm; the lower rpm reduces vibration and noise, provides exceptional control and maneuverability and enables the engine to turn larger propellers more efficiently. Equipped with rugged components, the 6068SFM boasts a heavy-duty crankshaft, larger bearings and stronger connecting rods than competitive marine engines in this class. The engine's heat exchanger, expansion tank and exhaust manifold are integrated into one component, eliminating hoses and fittings that can leak or break.

Featuring a full-authority electronic engine control unit and electronically controlled fuel injection pump, the PowerTech 6.8L provides exceptional fuel economy and throttle response, and protection by self-diagnosis. It offers upgraded application flexibility including either-side service for twin propulsion applications, poly-vee belt drives for increased capacity with reduced maintenance and a belt-guard to accommodate front-driven PTO-adapted units.

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Northrop Grumman To Supply Platform Management System

Northrop Grumman Corporation has won a \$15 million contract to supply six ship sets of machinery control and monitoring systems for the U.K.'s Type 45 "D" Class destroyer for the Royal Navy.

The contract, awarded by BAE SYS-TEMS Electronics, the Type 45 prime contractor, calls for Northrop Grumman to develop and deliver six platform management systems (PMS) for the Type 45 ships. The contract also includes options for life-cycle support, including maintenance, repair, spares management, equipment upgrades and training.

The PMS is a commercial-off-the-shelf (COTS) system that provides machinery control and surveillance for the ships' main engines, auxiliaries and other systems, as well as damage surveillance and control functions.

The primary function of the PMS is to enable shipboard personnel to access

vital information on the status of platform systems and to safely control them from a common interface.

The open architecture design of the PMS allows critical information to be gathered from the combat system as well as the integrated communications system and display it on the PMS workstations.

Pegasus Shipping Completes High Yield Bond Restructuring

Pegasus Shipping (Hellas) Ltd. has completed the restructuring of its \$150 million 11.8 percent First Preferred Ship Mortgage Notes with its Bond Holders. Under final terms, the company bought back its bonds from Bond Holders at \$0.50 for each bond and retains — full

equity control of the fleet. The total value of the transaction is \$75 million.

The completed restructuring represents almost two years of negotiations between the company, its advisors American Marine Advisors and Chanin Capital Partners and the company's two major Bond Holders Lehman Brothers and MacKay Shields.



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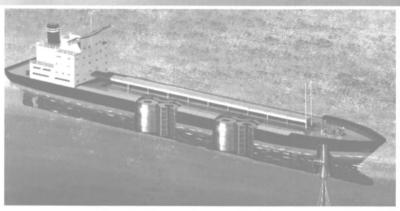
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Now the Carousel Ship





by David Tinsley, technical editor fechnical proposals for the

Technical proposals for the shipment of natural gas under compression rather than in the refrigerated, liquefied state have surfaced from time to time over the years, but have received a lukewarm response from the marine industry. The

considerable cost of the shipboard containment methodology has been a major stumbling block. Now, a Canadian engineering contractor has come up with an altogether more economic solution to the cargo carrying needs of compressed natural gas (CNG), and pitched at relatively short-distance sea transport applications.

Instead of the prohibitively expensive pressure bottles that have earlier been central to CNG transport concepts, Cran & Stenning Technology has proposed a more efficient and economical pressure vessel made from small-diameter pipe coiled into

a steel carousel. The CNG ship would be equipped with multiple carousel units, stacked below decks in inerted holds.

Each Coselle (coil in a carousel) gas storage unit contains 10 miles of 6-in. diameter pipe, wound within compact external dimensions of 50-ft. diameter and 11-ft. depth. The standard Coselle CNG carrier would be fitted with 108 coselles, giving a cargo capacity of 7,700-tons or 330-million cu. ft. The configuration would keep the newbuild cost to less than 40 percent of that of an equivalent CNG 'bottle' ship, it is

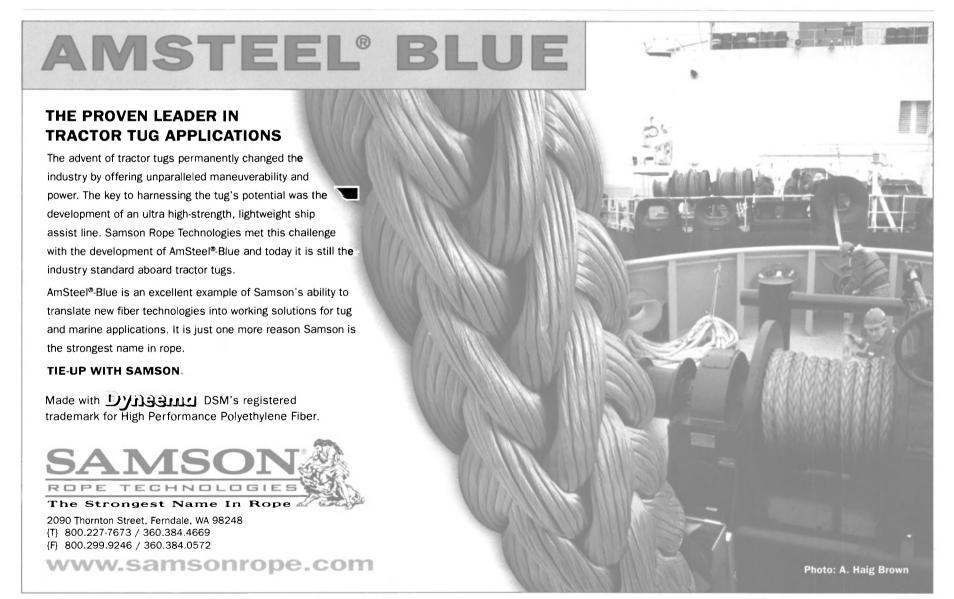
claimed, since the Coselles are much cheaper to produce than pressure bottles, yet offer an equivalent level of safety.

While the cargo volume pales against the 60,000-tons or so accommodated in a deep-sea LNG carrier, the latter requires a substantial infrastructure, including cryogenic facilities for liquefying the gas for transport, coupled with large reserves and large, sustained shipment

volume demand.

The modest load intake of the Coselle CNG ship is pertinent to its target markets, including offshore or small reserves, and small or developing markets, in which the LNG carrier mode is generally economically unattractive. The technology holds out the prospect of commercially exploiting small or marginal gas fields, akin to the way in which floating production, storage and offloading (FPSO) vessels have enabled a broader spread of oil reserves to be economically tapped.

For projects involving smaller volumes and shorter distances, an articulated tug-barge (ATB) unit has also been developed, with a shipment capacity for 80-million cu. ft. of gas in 28 Coselles. Cran & Stenning are hoping to give form to the concept before too long, in the shape of a pilot shipment scheme involving a tugbarge combination. The Canadian firm has the worldwide right to use and license the proprietary, patented Coselle CNG technology.



The safety features of the proposed vessel design are enhanced by the degree of cargo compartmentalization. the resistance of the Coselle unit to external load impact, and the fact that CNG is a gas, not a cryogenic liquid, like LNG.

Fast RoPax Contender from U.K.

The dramatic contraction in U.K. shipbuilding over the past quarter-century has served to highlight the resilience of the industry's remaining players. At the recent Fast 2001 event held in Southampton by The Royal Institution of Naval Architects, a new mark of industrial resolve was afforded by Vosper Thornycroft's display of a model of an exceptionally long RoRo catamaran that the Hampshire company has under development. As well as pushing back the bounds in catamaran ferry length, the stylish new vessel signals a plan by the predominantly naval builder to expand commercial shipbuilding.

Envisioned as a 'next generation' RoPax vessel, using a Wave Piercer Catamaran (WPC) platform, the concept has been given initial form at a length of 476 ft. (145-m), offering payload capacities up to 1,650-tons at speeds from 30 to 40-

Australian know-how in fast, lightweight vessel technology is reflected in the advanced design supplied by Incat Designs as the basis for the technical project, to which Vosper Thornycroft is marrying its skills in shipbuilding construction, engineering, ride control systems, and shipboard electronics, together with planned and throughlife maintenance programs.

In the bid for economy with speed, an all-diesel power plant burning heavy fuel oil has been nominated for the RoPax, with the designers favoring Wärtsilä's relatively new 38B medium-speed design in a four-engine configuration. Depending on whether 12-, 16- or 18-cylinder models are used, in accordance with actual speed and payload combination criteria, overall power concentration would be in the range of about 34,800-52,200 kW (47,300-71,000 bhp).

The ability to carry heavy freight vehicles and containerized goods as well as cars and passengers, and to efficiently vary transit speeds in accordance with fluctuations in traffic demand and mix, improves the year-round economics of the fast ferry. Twin objectives of robustness and lightweight would be met by adopting an aluminum alloy superstructure atop a high tensile steel hull. Allowing for naval tonnage commitments, VT is ready to deliver such a vessel by the 2004 season, from a new facility in Portsmouth.

Debut for A WISE Craft

Japan's unerring commitment to research into innovative maritime technology also found expression at the Fast 2001 conference by way of a status report on a project for a small, wing-insurface effect (WISE), fast passenger craft. As the first such passenger transport vessel in Japan, the prototype is being trailed on a 16-km route across Shinji-ko Lake, in western Honshu, and has the look and characteristics of an airplane.

Whereas much of the long-term development research in Japan is government-sponsored, the WISE project is a private undertaking financially supported by Fukushima Shipbuilding, and drawing on developmental input from Tottori

October, 2001

University.

The shipyard proponent has sought to demonstrate that a WISE vessel of a useful size could be designed and constructed with technology that is already available to a shipbuilder. Through the opportunity provided

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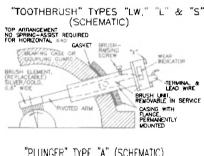
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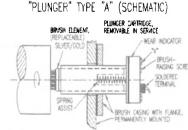
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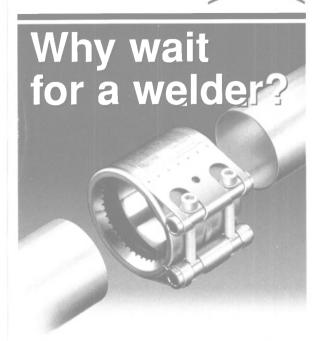
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Investment in Design

by the Shimane Prefecture authorities to test the vessel, valuable operating data should be obtained in the course of providing transportation on demand for up to eight passengers from the center of Matsue City to Izumo Airport.

While prudence dictates modest

speeds to begin with, the intention is to gradually increase vessel speed. The concept, as applied at the prototype's payload capacity, is claimed to lend itself to cruising speeds up to an astonishing 150-km/h. Two water-cooled reciprocal engines rated at 250-hp apiece

are mounted in the center of the craft's body, driving two propellers of twometer diameter at the top of the propeller masts via reduction belts. WISE addresses what is perceived as substantial scope for new solutions to a future demand for fast, light-duty, short-range

services, a field that is often not costeffective for very high-speed vessels. However, it is acknowledged that the testing and demonstration program needs more financial support if the concept is to be taken further to more advanced WISE designs.



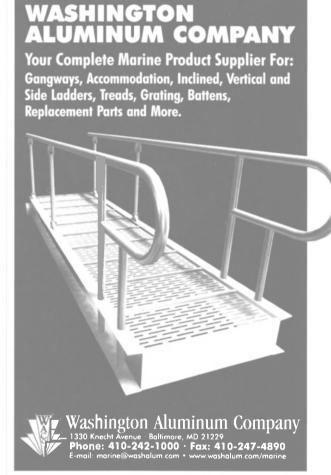
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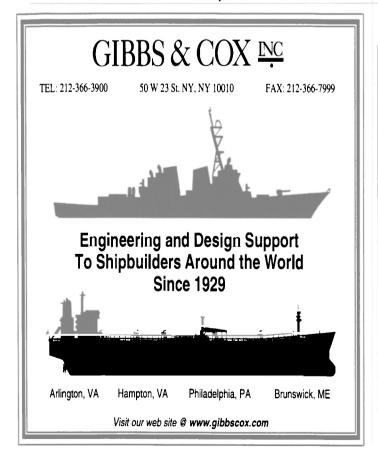
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Stolt-Nielsen Transportation Appoints New Chairman

Jacob Stolt-Nielsen informed the Board of Stolt-Nielsen S.A., that as part of the handover of his responsibilities he wished to resign as chairman of the Stolt-Neilsen Transportation Group Ltd. (SNTG), the Group's chemical transportation business. Jacob Stolt-Nielsen, who is the founder of SNTG and has been its chairman since 1959, will remain chairman of SNSA, Stolt Offshore S.A. and Stolt Sea Farm Holdings.

The board of SNSA decided to appoint Samuel Cooperman as the new chairman of SNTG, taking on the responsibilities with immediate effect and reporting to Niels Gregers Stolt-Neilsen, the CEO of SNSA. Reginald J.R. Lee, was promoted to CEO and given full responsibilities for the management of the business.

IZAR Wins Car Ferry Deal

IZAR has won a \$117 million contract to build two car ferries from an Algerian firm. IZAR apparently won the bid among heavy international competition, selected from an estimated pool of seven bidders.

Bollinger Increases Port Fourchon Capabilities

Bollinger's repair and conversion shipyard at Port Fourchon, La., on the Gulf of Mexico, can now accommodate rigs, ships and boats with drafts to 27 ft. (8.2 m), now that dredging is complete from the sea buoys in the Gulf to Bollinger's Fourchon 350-ft. (106.6 m) slip, which has also been deepened.

"The deepened waterway and slip permit us to offer services to larger jack-up and matted rigs as well as bigger ships and boats. We also have additional shore power providing electrical power for vessels' hotel loads as well as additional cherry pickers and forklifts that can lift from 20 to 55 tons," said Walter Berry, executive VP and COO.

Berry added that Fourchon's close proximity to the Gulf of Mexico decreases mobilization and downtime and the facility is supported by other nearby Bollinger shipyards whose machine shops, panel lines, pipe refabrication and propeller, carpentry and electrical shops provide rapid response without having to wait for subcontrac-



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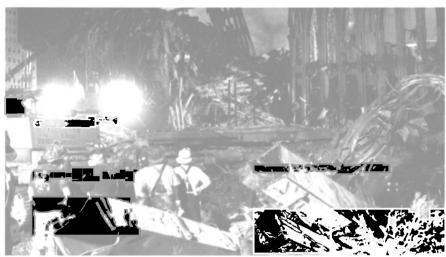
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Port Security Strengthened in Wake of Disaster



New York City Firefighters and various rescue workers stand in awe at the north end of Washington Street, looking at the WTC complex and collapsed South Tower. See related story on page 15 regarding the relief effort provided by Seamen's Church Institute during this national tragedy. (Photo credit: **Preston Merchant**, Seamen's Church Institute).

By Charley Havnen

The entire United States (and anyone else in the world with access to cable or for that matter any TV) has become intimately involved in what is sure to become the seminal event of our time. The World Trade Center terrorism will change all of our lives in some respect from the day of the event onward. The only question is how much our lives will be changed. Even after the current threats pass our lives will ever be altered. It is up to our government and us as to the direction our country and our lives will take. If we leave it to our enemies, they would destroy us.

Security of our airborne and waterborne commerce has now become a major national issue. This is an opportunity for the USCG to bring the maritime industry together for the common good.

The Secretary of the Department of Transportation (DOT) has directed the USCG improve waterborne security in our port areas, as is being done with the air travel industry. Initially this meant that individual Coast Guard Captain of the Port (COTP) units and Districts were to quickly develop plans and methodology suitable to each individual port area.

There is no question that the USCG is taking great pains attempting to minimize the impact upon maritime commerce while incrementally increasing waterborne security.

The USCG knows that the only real way to prevent the type of sabotage that we are worried about is to place armed personnel on every vessel within the U.S. Territorial Sea. If maritime sabotage does occur - this may be the only appropriate course of action.

Our ports and waterways are so complex and diverse that variations from one port area to another are appropriate, certainly on a short-term basis and probable in the long term. It is likely that ocean going deep draft traffic will be treated somewhat differently from non-ocean going vessels because potential threats are different.

These increased security measures at the minimum request all facility and vessel operators to review their security



Before: The cover of the June 28, 2001 edition of *MarineNews* featured Helen McAllister flanked by the World Trade Center in the background. (*Photo Credit:* **Walter Garschagen**).



After: What remains of the facade of the South Tower, viewed from Washington Street. (*Photo credit: Preston Merchant*, SCI).

procedures and possibly update them. Formal security plans are not currently required. Some ports require specific authorization from the USCG Captain of the Port to navigate at all.

Specific liquid cargo movements and cargo handling will come under close scrutiny in some ports and not in others.

Containers will be of particular concern and will be extremely difficult to keep secure. It is not at all clear how passenger cruise lines will be impacted around the country.

The variations from one port area to another are too numerous to specifically enumerate. The information is however available from each local Captain of the Port office around the country.

It will likely be very difficult for individual vessels and operators to become expert in the broad range of security expectations from one port to another, but it is essential to our survival as a successful commercial nation.

Coast Guard Area Commanders (both East and West) have promulgated special regulations under 33 CFR Part 165 concerning Naval Vessel Protection Zones. These zones limit and control traffic in close proximity to naval combatants, auxiliaries, and vessels leased to or chartered by the U.S. Navy.

All vessels within 500 yards of a naval vessel must operated at minimum speed and proceed as directed by the authorized officers (USCG Captains of the Port or other designated officer). Vessels may not approach within 100 yards of a naval vessel without permission of these authorized officers.

to obstruct terrorism and not impede commerce. While the mechanisms to accomplish this will change and evolve over the coming months, the USCG seems to be making great efforts in working closely with the maritime industry to achieve both of these goals.

Clearly, the goals of Port Security are

Charley Havnen is a commander USCG Ret. His organization can help you with your vessel construction project, regulatory problems, vessel manning issues, procedure manuals, accident analysis or expert witness. His organization can do what you can't or don't want to do. He can be reached at the Havnen Group: (800) 493-3883 or (504) 394-8933, fax: (504) 394-8869.

Corpus Christi - Sept. 11th

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

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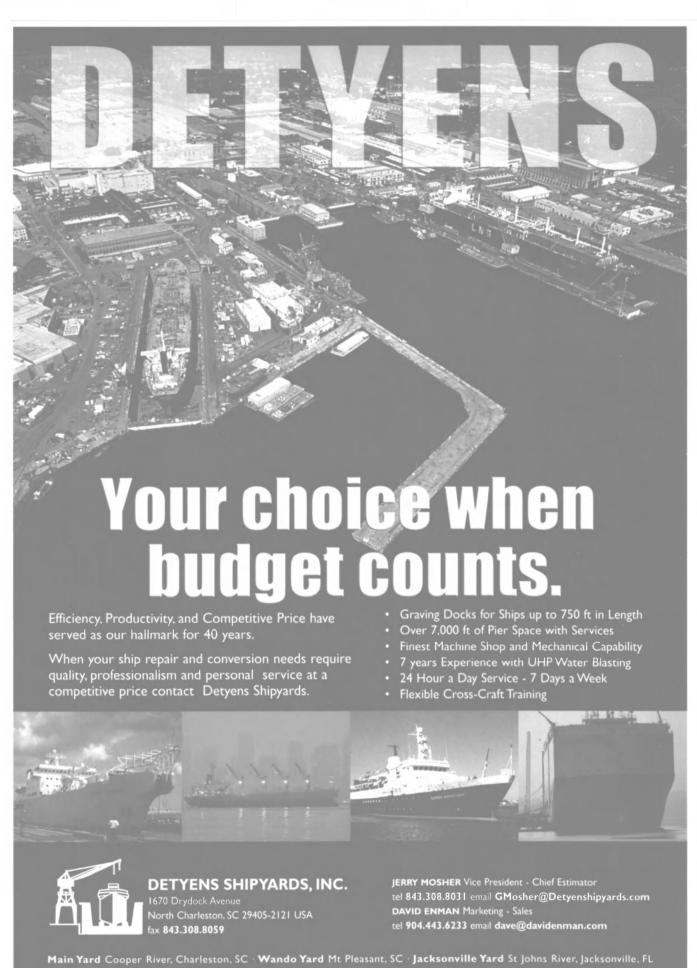
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A Race With A Meaning ... Before the Fall of the Towers

Races on Sunday, September 2, I had the opportunity to ride back from Pier 86 on

Following the Intrepid's annual Tug 46th St. in Manhattan to Staten Island on the Janet M. McAllister. I remember sitting on the edge of the tug, the waves

slapping against the sides, as the powerful vessel motored south from Midtown Manhattan to the Staten Island port



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MR/EN senior editor Regina Ciardiello aboard the Janet M. McAllister — the spot from which she viewed the World Trade Center for the very last time before the terrorist attacks on September 11, 2001.



Reinauer's Janice Ann Reinauer and Dace Reinauer line up for the commencement of this year's Intrepid Tug Races.

where the company keeps its tugs. I also vividly remember seeing the World Trade Center as I had never before from a tug in the Hudson River. Little did I know that this would be the very last time I would ever see them --- for the next time I would view them would be from the roof of my 12-story office building, smoke billowing from the top collapsing in front of my eyes.

The tug, which has been dubbed New York City's most powerful, finished second all-around with a time of five minutes, 23 seconds at this year's Intrepid Tug Races — right behind Tugz's Z-Two, which defended its title as last year's winner. Z-Two crossed the finish line at Pier 86 with a time of five minutes, 17 seconds — better than its winning time last year of seven minutes, 32 seconds.

The tugs lined up at the 79th St. Boat Basin, racing along the Hudson down to the finish line at Intrepid's Pier 86. Coming in behind the McAllister and Tug-Z vessels were Janice Ann Reinauer, which finished third with a time of five minutes, 38 seconds, and K-Sea's Beaufort Sea finishing fourth.

An interesting twist that developed during the race was that the actual winner (though not formally registered) of the race was Don Jon Marine's Anchor Handling Supply Tug Powhatan with a time of five minutes, seven seconds. The supply vessel, which was a last minute entry managed to pull ahead of its smaller competitors — capturing the title as this year's (unofficial) winner.

- Regina P. Ciardiello

SCI: Disaster Relief on the Fly

On Tuesday, September 11, New Yorkers— and the world— were jolted into a day of terror and tragedy as two commercial jetliners plowed into the North and South Towers of the World Trade Center, leaving more than 6,000 missing persons.

Seamen's Church Institute (SCI), a perennial source of strength and support for the International maritime community, went into action immediately, setting up a 24-hour relief effort that, over the course of the days following, has served as a safe haven for rescue workers, New York City police officers, firefighters and members of the Army National Guard.

By Regina P. Ciardiello, senior editor

With its 175-year tradition of responding to mariners in need, Seamen's Church Institute (SCI), which is located at 241 Water St., in the heart of New York's "Maritime District," near the South Street Seaport, has, on many occasion, taken on the role of a "safe haven" during some of the most historic as well as tragic, incidents on the high seas

According to the Rev. Canon Peter Larom, SCI's executive director, the



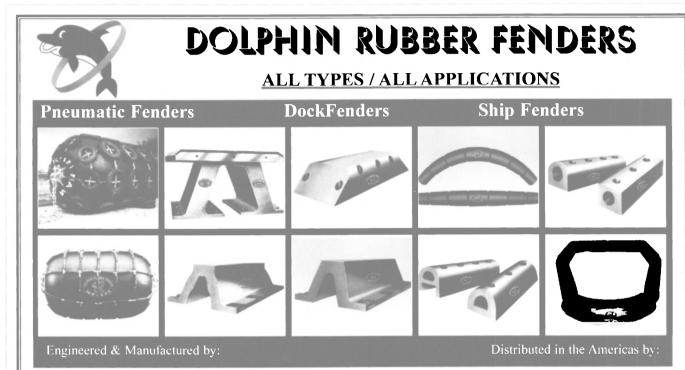
The Rev. Canon **Peter Larom**, (at left), executive director of the Seamen's Church Institute, with members of a fire company from Newport, R.I., who had visited SCI's 24-hour relief center. (*Photo credit: Debra Wagner*, SCI).

Institute offered to put up the crews of both the Titanic and the Andrea Doria following their doomed voyages.

More recently however, the Institute came through for the City of New York in 1993, when the World Trade Center was hit with by terrorism when a car bomb exploded in its parking garage. The Institute allowed the Port Authority of New York/New Jersey, whose offices were located in the Towers, to use some of their office space for six months while they rebuilt. This time, however, in reaction to a tragedy of much greater magnitude, SCI put its efforts into high gear as a central relief station for rescue workers. Upon entering the ground floor of the SCI, it is inconceivable to believe

that just days earlier this is the same spot where the Institute holds its Simulator Training classes as the entire area was covered with boxes filled with everything from food to socks, to work boots and toothpaste. These items, which were received by the Institute through donations from various church organizations, coupled with the constant flow of volunteers who provided the workers with food and drinks, rounded out what SCI's director of communications, **Debra Wagner**, dubbed, "emergency relief on the fly."

According to Wagner, more than 500



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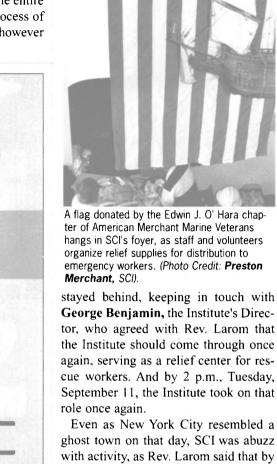
people visited the Institute every four hours to obtain food, a cup of coffee, or to just have a place to rest

Getting it Together

On the morning of September 11,

executive director Rev. Larom was returning from Houston, Texas. In fact, he was traveling over the Williamsburg Bridge from Brooklyn into Manhattan when he saw a plane hit World Trade Center One. He immediately abandoned

his car on the bridge and walked across into Manhattan's lower East side, making his way over to the Institute. When he arrived, the building — and the entire downtown area — was in the process of being evacuated. Rev. Larom however



again, serving as a relief center for rescue workers. And by 2 p.m., Tuesday, September 11, the Institute took on that role once again. Even as New York City resembled a ghost town on that day, SCI was abuzz with activity, as Rev. Larom said that by the next morning, there was a constant

stream of people who visited the relief center on Water St., as well as two auxiliary posts set up through the Institute at nearby St. Paul's Church on Fulton St. and Broadway, and at One Liberty

Plaza.

A Tragedy Hits Home

While this tragedy has hit a spot in the hearts of those involved in the shipping community, the task of getting one of the nation's premier and historic ports back in business is a top priority. The NY/NJ Port Authority's headquarters were located in one of the Towers, which are now just piles of rubble waiting to be transported via tugboats to Fresh Kills Landfill on Staten Island. Aside from being a dealt a jolting financial blow in trying to establish itself as the hub port of the Eastern Seaboard, the Port Authority was dealt with a personal tragedy as well — Neil Levin, the Authority's executive director, is still regarded as one of the missing. "This will hit the port industry very hard," Rev. Larom said. "It's a huge setback, which will cripple the industry. Therefore we must link together and get behind the efforts of Port Commerce Director, Rick Larrabee, (who is also an SCI board member,) to re-establish the Port." He added: "While this disaster affects the financial industry, it also affects the maritime industry — the Port Authority is the agency that we relate to as shipping people."



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Following Wake of Terrorist Attacks, USS Cole is Relaunched

Shortly following terrorist attacks in both New York and Washington, D.C., USS Cole, the destroyer, which was itself the victim of a terrorist attack, was relaunched back into the water on Sep-

tember 14 at Northrop Grumman Corporation. The ship was launched a day earlier than previously scheduled at the company's Ingalls Operations.

The ship had been moved onto land in

January into a construction bay near where Cole was originally built by Northrop Grumman. The USS Cole crippled in a terrorist attack in the Port of Aden, Yemen, on Oct. 12, 2000,



Stars and Stripes Forever: Northrop Grumman relaunched the USS Cole on September 14 at its Litton Ingalls Shipyard in Pascagoula, Miss.

returned to its construction shipyard on the deck of the Norwegian heavy lift ship Blue Marlin last December.

Capt. Philip N. Johnson, USN, supervisor of Shipbuilding. Pascagoula, said that work to date aboard the USS Cole has consisted of more than 550 tons of steel structural repairs to replace the damaged area's exterior plating. He added that the relaunching of Cole represents completion of all structural repairs and restoration.

Other completed work includes the replacement of damaged and unserviceable equipment, and removal, evaluation and recertification of critical systems such as shafting and propellers. The repair process is moving along as scheduled.

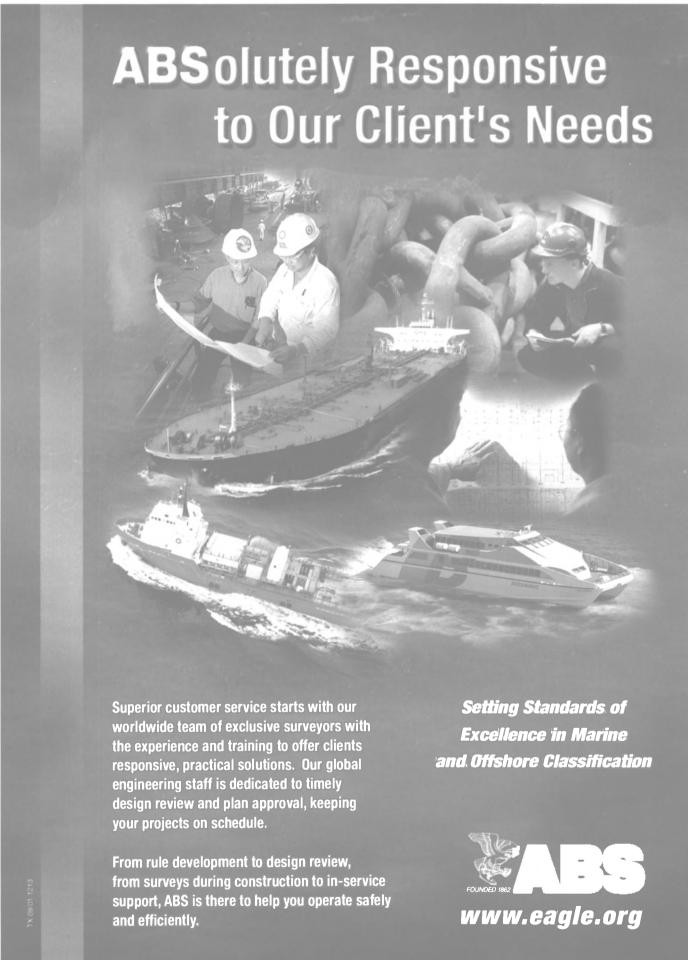
Following the relaunch, work will be completed on component system assemblies, alignment of machinery, energizing, testing and alignment of all systems, and completion of logistics and supply support outfitting. USS Cole will then be turned over to the crew for training and recertification.

Northrop Grumman Donates \$1 Million Towards Relief

Northrop Grumman Corporation reported that the company and its foundation are collectively contributing \$1 million to relief efforts established in the aftermath of the Sept. 11 terrorist attacks.

"We at Northrop Grumman are deeply saddened by the terrible tragedies occurring last week," said **Kent Kresa**, Northrop Grumman chairman, president and CEO. "This gift of \$1 million will provide assistance to the victims of the attacks, as well as to the firefighters and police of New York and Washington, D.C., who are valiantly dealing with the aftermath of these horrible events."

A portion of the commitment includes dollar-for-dollar matching of employee contributions.



ABS: All Employees Evacuated Safely From WTC

ABS confirmed that all employees of its New York Executive Office, located on the 91st floor of One World Trade Center, evacuated safely from the building.

The office normally staffs 22 people. At the time of tragedy 16 employees were either in the office or in transit to the office. All 16 employees are accounted for. Physical injuries were limited to minor cuts and abrasions.

"It is miraculous given the point of impact of the aircraft was immediately above the ABS offices," said ABS Chairman and CEO Frank J. larossi. "Saddened as we are by the tragedy, we are greatly relieved that every one of the ABS family survived."

Day-to-day operations of ABS are unaffected by the loss of the New York office, which temporarily relocated to New Jersey on Monday, September 17.

INTERTANKO Offers Support, Vital Information During National Tragedy

The terrible tragedy that occurred on September 11 will live long in everyone's memory. The implications will be far reaching and at this stage it is not known what reprisals will result. With so many losing their lives the implications on vessels calling at U.S. ports seems rather trivial in comparison. Nevertheless merchant shipping was affected. The LOOP terminal was closed for a while and entry to certain ports was restricted or delayed.

The Association will keep in close contact with the U.S. Coast Guard and advise our members of any additional security or other procedures implemented in the wake of the terrorist attacks.

The world's insurance markets are most likely affected by the massive claims that will be made on insurance and re-insurance policies. In London the War Risks Rating Committee met on September 12 to assess the implications. INTERTANKO's Insurance Committee, which meets on October 4 will be discussing this matter. At this stage the extent of the claims and the implications can only be a matter of speculation.

INTERTANKO's legal team remains at hand to respond to any requests from members and associate members for advice on the charterparty implications for members' vessels affected by this tragedy.

Given the great diversity of charter party provisions we will not generalize on what the affects of delay suffered by vessels will have on owners rights/liabilities in either a voyage or time charter context.

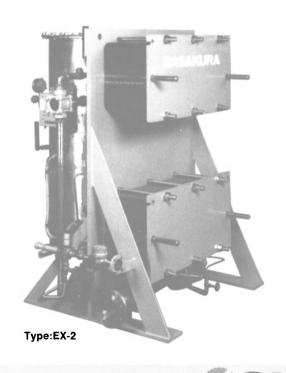
NYC Fireboats Provide Critical Support

Long considered relics from days gone by, the Fire Department of New York Fireboats played an important role in supplying the fire fighting water to battle the blazes at the World Trade Center for the first 36 hours. The fireboats acting as floating pumping stations are manned by NYFD engineering members from the nation's oldest maritime union, the Marine Engineers Beneficial Association District 1. These firefight-

ers are said to have been on a 24 hour on and 24 hour off schedule while supplying their NYFD brothers with much needed water from the Hudson River. It is said that those MEBA members and firemen were also involved in the search and rescue while off duty.



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Offshore News GOM Softness Drives GLM Score Down

Global Marine reported that the company's worldwide SCORE, or Summary of Current Offshore Rig Economics, for August 2001 decreased by 3.2 percent from the previous month's SCORE.

Global Marine Chairman, president and CEO **Bob Rose** said, "This month's SCORE report, which reflects August activity levels, shows the worldwide SCORE down slightly as softening Gulf of Mexico dayrates overshadowed the continued strength of international offshore rig markets."

Global Marine's SCORE compares the profitability of current mobile offshore drilling rig dayrates to the profitability of dayrates at the 1980-1981 peak of the offshore drilling cycle, when speculative new rig construction was common. In the 1980-1981 period, when Global Marine's SCORE averaged 100 percent,

new contract dayrates equalled the sum of daily cash operating costs plus approximately \$700 per day per million dollars invested. In addition to a worldwide SCORE covering key types of competitive offshore drilling rigs in key drilling markets, a separate SCORE is calculated for certain types of rigs and certain regions to indicate the relative condition of rig markets.

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Willbros Purchases Barge For W. Africa Work

Willbros Group Inc. subsidiary, Willbros West Africa Inc., has added to its available offshore fleet with the completion of the purchase and refitting of the WB 82. The WB 82 is a 100-ton derrick/work barge, measuring 256 ft. (78.8 m), with an eight-point anchor system and accommodations for up to 135 persons. The WB 82 will join the WB 318 combination derrick/lay barge and the M/V Eros support vessel in providing comprehensive construction services to the Nigerian offshore market, with the current backlog assignment expected to last through the second quarter of 2002.

Michael F. Curran, president and COO, said, "This addition to our fleet of marine equipment will allow us to be even more responsive to the market for marine hook-up, rehabilitation and lift services in the shallow waters offshore Nigeria, a country where we have been active since 1962."

Saibos Lands \$230M Contract

Saibos CML, an equally owned subsidiary of Bouygues Offshore and Saipem SpA, has been awarded a contract for the Kizomba A Development Project in Angola for an approximately total amount of \$230 million (Bouygues Offshore's share: approximately \$115 million).

Esso Exploration Angola (Block 15) Limited (Esso), a subsidiary of Exxon Mobil Corporation, is the operator (40 percent). Other participants include BP Exploration (Angola) Limited (26.6 percent); Agip Exploration Angola B.V. (20 percent); and Statoil (13.3 percent). Sonangol is the concessionaire.

The three-year contract covers: Engineering, procurement, construction and installation of flowlines for fluid transfer and an umbilical from the FPSO to supply the TLP (Tension Leg Platform) with electricity; Engineering, procurement, construction and installation of the crude offloading system, comprising a CALM buoy and two rigid lines; Procurement, fabrication, pre-installation and connection of the 15 FPSO anchors; Installation of the subsea manifolds and umbilicals; and, Engineering, procurement, construction and installation of the risers and subsea injection lines.

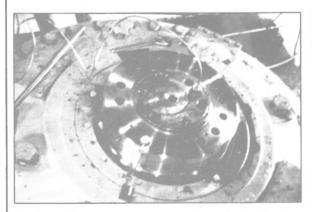
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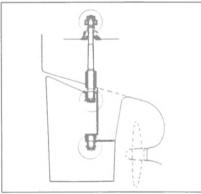
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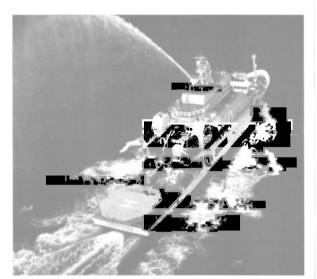
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All-Purpose Aid And Hospital Vessel Delivered

A multi-role hospital and support ship, built at Gijon yard within schedule, was delivered by IZAR to its owner, Spain's Instituto Social de la Marina (ISM, a fishermen's welfare and health care organization, part



IZAR recently delivered a 319 x 58-ft. (97.3 x 17.7-m) hospital ship to Spain's Instituto Social de la Marina (ISM, a fishermen's welfare and health care organization, part of the Spanish Social

of the Spanish Social Security).

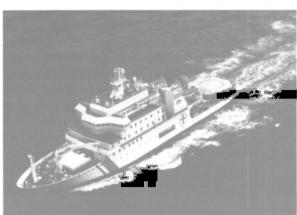
IZAR was awarded the design and construction of this vessel, that is intended to sail the oceans in support of the nation's fishing fleet — although the vessel will also assist any other vessel of any flag with logistic aid, medical care, pollution control, and even emergency towing and fire-fighting.

High priorities have been given in the design to the access and arrangement of the hospital and medical area as well as to the ship's maneuverability and operational efficiency, and its ability to launch and recover rescue and salvage boats.

The vessel, which measures 319×58 ft. (97.3×17.7) m), has been designed from scratch around the hospital and medical facilities, concentrated on one single level (the main deck), with direct and clear access from the helideck and rescue boat platform.

Facilities include emergency and first-aid room, operating theater, intensive-care unit, X-ray unit, isolation rooms and laboratory, as well as accommodation for 17 people in single and double outer cabins, plus a forward lounge for convalescent patients.

A forward cargo hold has space for medical containers carried under controlled temperature and humidity conditions, and an emergency power plant is installed for exclusive hospital use.



Additionally, separate accommodation on the upper deck is also provided for rescued people in 15 double outer cabins able to house 30 people, with their separate rest and dining rooms.

Two further decks over the main deck accommodate a crew of 38, including two health and other specialist staff, such as divers, expected to be employed on solving common fishing problems such as clearing fouled propellers and repairing hull leaks.

The vessel, which carries the most updated equipment for spill control and oil recovery, and for fighting fire on other vessels, is able to supply emergency towing, fuel, drinking water, power and compressed air.



Vessel of the Month

The arrangement grants the hospital, medical and rescue assistance areas a full independence and insulation from the rest of the vessel. Insulation, including an extremely low level of noise and vibrations, actually was required not just for comfort, but for meeting surgical and

medical specifications.

While onboard safety remains a top priority, Izar also took into consideration the vessel's comfort, which is ensured by a pair of folding fin stabilizers. All the latest regulations for passenger ferries are met, including an ability to survive 500 mm water on the main deck.

A fully redundant propulsion plant comprises two independent engine rooms, with one engine in each, to drive twin retractable azimuthing propellers, and a large auxiliary engine supplies enough output for emergency propul-

sion. The system, combined with a pair of flap rudders, guarantees improved maneuverability and steering, and reduced noise and vibration, even at very low speed.

With an operational range of 7,000 miles, the vessel has a service speed of 16.9 knots; a trial speed of 17.2 knots at 90 percent of the maximum engine rating has been programmed.

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Main Particulars

Main Particulars
Length, o.a
Length, b.p
Breadth, (molded)
Depth, molded, to main deck(7.7 m)
Deadweight, design
Draught, design14 ft. (4.3 m)
Scantling
Speed, trial at 90 percent MCR17.3 knots
Speed, service at 80 percent MCR 16.9 knots
Cruise range
Classification Lloyd's Register
Stabilization equipment .Fin stabilizers and bell tank
Main engines 2x four-stroke diesel engines
Output 2 x 2,700kW/750 rpm
Auxiliary engines 3 x 500kW/1,500 rpm
Emergency genset 1 x 500kW/1,500 rpm
Two reduction gears
Propellers
Boilers 1 x 1,000kg/h; 2 x 500kg/h
Mooring equipment 2 x mooring windlass
Accommodation96
Patients
Rescued people30
Crew
Apprentices
Hospital section
Facilities: First aid room, Operating theater, Sterility
room, X-ray room, Lab, Intensive care unit, Morgue
Cargo section .950 cu. m (6TEU in hold, 3TEU on
deck)
Cargo craneSWL 10t/12-8m
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Tow equipment One towing hook
SWL
Life-saving equipment .2 x semi-close life-boat; 2 x
semi-rigid rescue-boat; 1 x main salvage-boat
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Norwegian Dawn's Keel Laid At Meyer Werft

according to MSC/circular 809

The first of 67 blocks of the new 92,000-gt cruise vessel, Norwegian Dawn, was lifted into place on September 1 at Meyer Werft's new covered building dock in Papenburg, Germany. The block, which measures 66 x 106 x 26 ft. (20 x 32.2 x 8 m), and weighs approximately 500 tons, was lowered via the yard's 800-ton crane.

Norwegian Dawn will have an overall length of 965 ft. (294.1 m), a breadth of 106 ft. (32.2 m) and will move at a speed of more than 25 knots.

Power (58,800 kW) will be generated by a diesel-electric system; the vessel will be driven by two 20 MW azipods.

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Ship Repair & Conversion

ASRY's Services Are In High Demand

The second quarter at ASRY has continued at a brisk pace, with a high demand for the yard's services. The last few months have seen approximately 25 vessels being repaired and converted—including the unique conversion of Abouzar 1200 from a derrick ship into a deep water pipelay barge.

Of the other vessels repaired, four were over the 250,000 dwt mark, with Olympic Loyalty being the largest at 308,041 dwt. Approximately seven vessels were between 40,000 dwt and 100,000 dwt with the remainder below 30,000 dwt. Work was also undertaken on USS Raven for the U.S. Navy, as well as on a variety of dredgers and jack up rigs.

The second quarter brought about an increase in the number of inquires and dockings for chemical carriers. Tankers that were drydocked during this period included Bow Lady at 32,227 dwt; Al Farabi at 23,953 dwt; and NCC Najran at 28,027 dwt. Other contracts included Skopelos, 274,950 dwt; Berge Chief, 289,980 dwt; and Samco Europe, 255,087 dwt. Work was also performed on two dredgers: Nautilus (6,250 dwt) and Rasheed (1,577 dwt) along with jack up rigs Arabiyah 4 and Bibby Marinia.

The yard has also seen an increase in

Ship Repair And Conversion 2001 Set For London

Ship Repair and Conversion 2001 scheduled to be held from November 28-29 at London's Grand Olympia Hall — will be celebrating its 10-year anniversary. The exhibition is expected to boast 15 percent more exhibitors than last year's event. Subsequent to the success of last year's exhibition, more than 360 exhibitors are expected to participate. Ship Repair and Conversion 2000 set attendance records in London last November with a 10 percent increase on the previous year's best of 2,400 visitors — 10 percent of which are at the managing director or chairman level.

Approximately 317 exhibitors from 30 countries are expected at this year's venue. The exhibition also features the Ship Repair and Conversion 2001 Conference, which will explore all areas of the ship care industry.

Topics that are planned for discussion include: Strategic Review of the Global Shiprepair & Conversion Market and State of the Industry Debate.

To receive a conference agenda, log on to www.shiprepairex.com or call +44(0) 20 7553 169, for further information.

demand for painting and blasting services and during the first six months, approximately 480,337 sq. m. of blasting were performed with approximately two million sq. m of painting completed. This is up approximately 22.5 per-

cent on the same time period last year — and the trend looks as though it will continue for the rest of the year.

Available specialist contractors at ASRY has increased in the yard with the addition of Golten (Dubai) opening a

new facility with five technicians now able to undertake work on Woodward Governors and fuel injection equipment.

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New & Notable Rolf To The Rescue: German Yard Delivers Aluminum Rescue Launch

German shipyard Bootsbau & Yachtservice Wilhelm has delivered a new aluminum rescue launch to the Bay-

Wasserwacht

Rolf, an 37-ft. (11.2-m) Fast Rescue Craft fitted with UltraJet UJ340 waterjets.

erisches Red Cross in Münich. The 37-ft. (11.2-m) vessel, which will be used for daily rescue purposes and as hospital transportation on the Chiemsee in Bayern, will be equipped with a single MAN engine, driving a single UltraJet 340 waterjet via a ZF Gearbox.

Intended for continuous operation — day and night — the vessel has accommodations for two crewmembers as well as a doctor.

Sea trials conducted in Wilhelmshaven, Germany proved that the vessel's design complied with all specifications, achieving a service speed of 25 knots, with a 29-knot maximum. The vessel's aluminum hull features a raised bow with narrow stern section and is designed for maneuverability, high levels of seakeeping and a stable work platform. A thermally-insulated wheelhouse features lateral sliding windows and a mast for a loud speaker and navigation lights.

Rolf's diesel heating system is designed to keep casualties at a moderate cabin temperature all year round, and its electronic equipment onboard includes navigation, radar, DGPS and depth sounder.

Fusion Polycraft's RIB Designed To Be Indestructible

Fusion Polycraft offers the FRC 1; a RIB comprised entirely of heavy-duty polyethylene or GRP, and touted as indestructible. The RIB's hull, sponson and seating are all made from polyethylene — with the hull fabricated from 12 mm thick PE80 sheeting. IMO/SOLAS-approved, the RIB has many applications including offshore and inshore rescue, coastguard police and workboat.

With a waterline line length of 17 ft. (5.2 m) and a beam of 8 ft. (2.6 m), the vessel has U.S. Coast Guard approval, and is predicted to require no repair/rec-

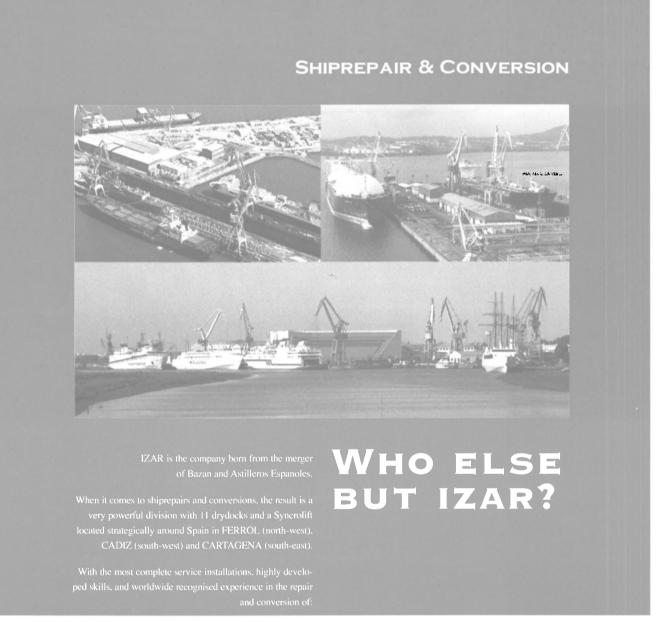
tification work after a five-year period.

The vessel's radar-resistance should prove beneficial for the military "Stealth" market. The RIB has the ability of being "cached," meaning that when it is submerged underwater for a long period of time, the water can be expelled and float easily to the surface where it is then driven off.

Fusion propulsion recommendations are either a 300 hp UltraJet/Yanmar engine package, or the use of twin 150 hp outboard engines. Providing power to the UltraJet 251 waterjet is a single Yan-

mar 4LHG-STE marine diesel, providing 172 kW, bringing the vessel to speeds of 28 knots when loaded with three crew and 150 liters of fuel.

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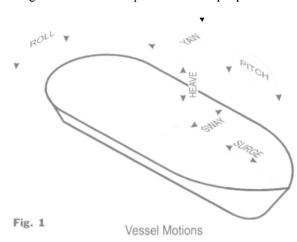
Sea-Kindly: A Steady Vessel by Design

John W. Waterhouse, P.E., Elliott Bay Design Group

Seakeeping refers to motions of a vessel in waves, but sea-kindliness is a characteristic sought after in most vessels. A sea-kindly vessel is easy on its crew and easy on its gear. Trying to define sea-kindly is difficult. The deep sea mariner may use qualitative descriptions such as "an easy roll" or "a wet boat," but the vessel designer must look for quantitative descrip-

There are six degrees of motion in a vessel, three are linear: surge, heave, and sway; three are rotational: pitch, roll, and yaw. (See Fig. 1). Each of these degrees of motion has associated values of amplitude, velocity, and acceleration. A vessel in a beam sea can be rolling up to 30 degrees (amplitude) and the associated acceleration could be 0.5 g or 1 g. To a designer, the accelheight. This method quantifies what people have hiserations are usually the key value since they translate into forces on equipment and people. (Motion sickness is a function of acceleration levels and periodicity.)

The energy input for motions comes from waves and there are several terms that need to be considered. Each distinct wave has a height (distance between trough and crest) and a period (time between succeeding crests). The sea is a spectrum of waves, which is comprised of a variety of waves of different heights and periods. The spectrum can be characterized by two terms: the significant wave height and the modal period. If we collect a thousand observations of wave heights and periods we can produce a graph similar to Figure 3. If we take the average height of the 1/3 highest waves, that number represents the significant wave



Pick Your Design

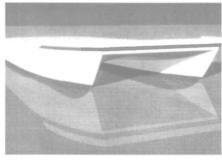
Many different approaches have been tried to improve seakeeping, from fundamental differences in hull shape to active or passive appendages. A brief discussion of each of these follows: (NOTE: Monohulls and Centerboards, not illustrated here, are discussed on page 30)



Fin Stabilizers - By using airfoil-shaped fins mounted low in the hull amidships, significant roll reduction can be achieved when the vessel is underway. Such fin stabilizers use a motion sensing controller that signals the fin to change its angle of attack to the water, thus producing a countering force to the wave motion. Fin stabilizers are typically electrohydraulic units and are more effective the faster the vessel is moving.

(photo courtesy Rolls-Royce)

Catamaran Hull



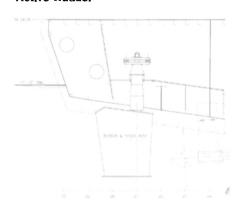
Catamaran Hull - This type of vessel has some limits for seakeeping imposed by the hull design. If the wave period is twice the spacing of the hulls, then the natural frequency in roll creates a resonant condition and extreme motions. Further, the cross structure is vulnerable to slamming if the wave heights are large enough. Finally, due to the relatively short hull length for the displacement, catamarans can experience significant pitch motions.

SWATH Hull



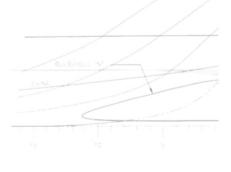
SWATH Hull - This type of vessel, a Small Waterplane Area Twin Hull, has excellent seakeeping characteristics. The design consists of two submerged hulls with slender struts rising through the water's surface to support a crossstructure. Because the buoyant hulls are well below the water's surface and by keeping the struts as slender as possible, there is little opportunity for the waves to act on the vessel. The main vulnerability is slamming on the cross structure when the waves get large enough.

Active Rudder



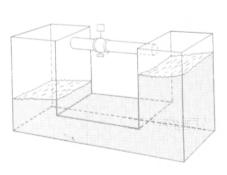
Active Rudders - Similar to the fin stabilizers, an active rudder system will turn the rudders to allows for the use of existing equipment, but obviously suffers in efficiency with comparison to fin stabilizers.

Bulbous Bow



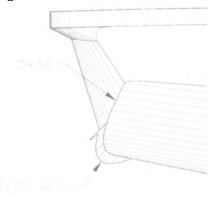
Bulbous bows - These were originally developed as a means of reducing vessel resistance. Researchers later observed that depending on the bulb's size and shape it could improve pitch resistance. In extreme seas however, when the forefoot of the vessel emerges, an improperly designed bulb can contribute to slamming.

Anti Roll Tank

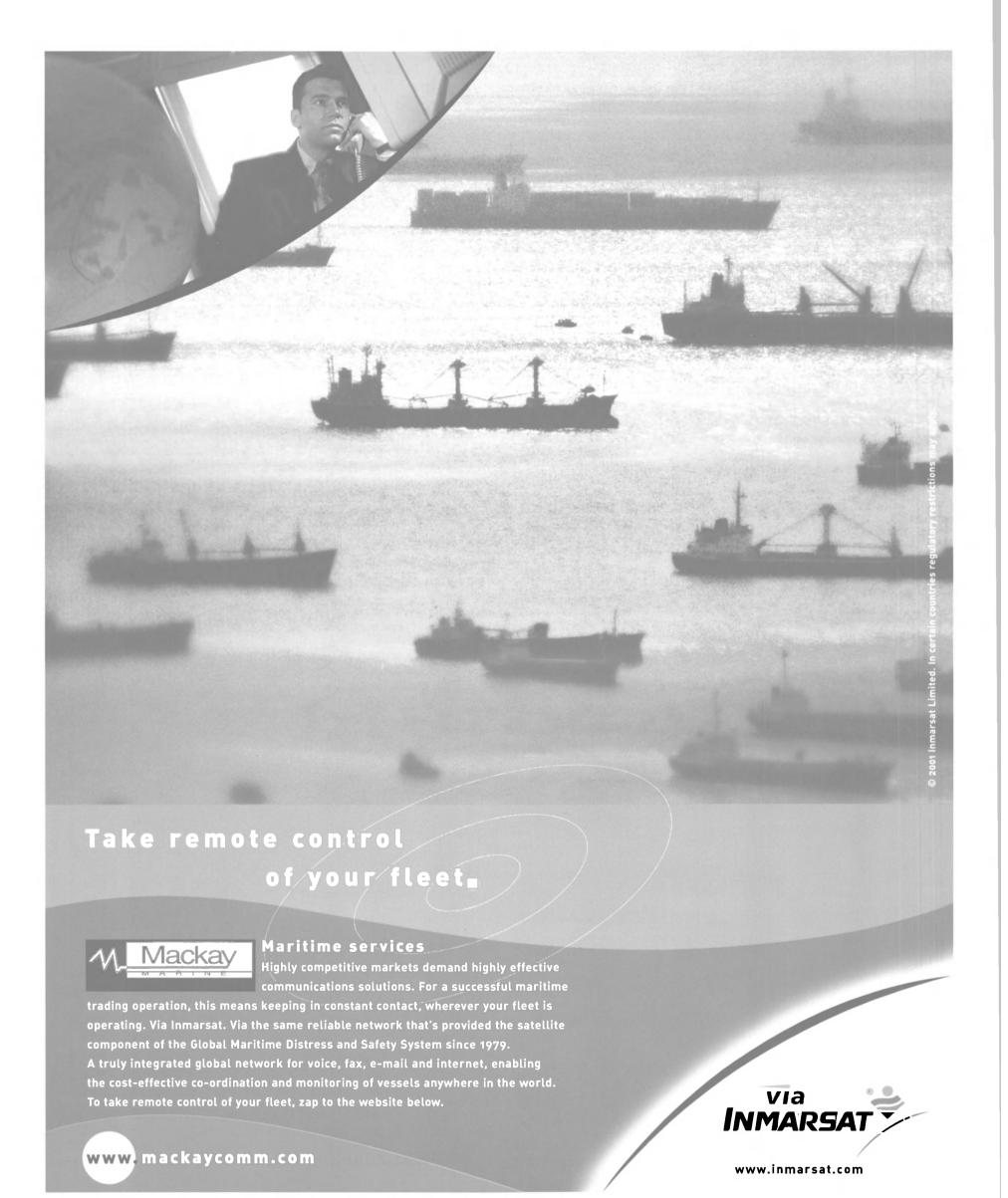


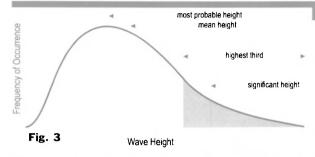
Anti-roll tank - To combat vessel rolling, designers have used different styles of water hallast tanks. By placing such tanks up high on a vessel and by tuning them to the vessel's natural roll period, significant improvement in motions can be achieved. The disadvantage of these tanks is that they need to be located in prime parts of the ship to be effective. A particular advantage of such tanks is that they are effective at a range of vessel speeds.

Bilge Keel



Bilge keels - These passive devices have typically been used to add damping in roll. A fixed plate running approximately 40 percent of the vessel's length along either side of the hull, the bilge keel must be placed to maximize hydrodynamic drag in roll and minimize hydrodynamic drag while underway. A drawback of this design is that gear being worked on over the side can potentially foul on the bilge keels.





torically observed qualitatively. The modal period is determined by finding the average value of the wave periods.

Other factors that affect waves are the fetch and the water depth. Fetch is the distance of open water available for a wave system to develop. A protected bay has little fetch and waves cannot fully develop, regardless of the wind strength. Water depth can produce larger waves, especially when the depth of water is less than half the wavelength. A good example of this occurs at harbor entrances, where a bar or local shallowing can develop. Such a bar can produce larger than ordinary waves as the wave energy is compressed by the rising ocean bottom.

In extreme seas two other characteristics come into play. These are deck wetness and slamming. Deck wetness refers to the presence of green water on deck, not just spray. Having waves board the vessel clearly limits the crew's ability to handle equipment or to safely move around. Deck wetness is a criteria that can be used for limiting operation. Slamming is more serious. A vessel slams when the bow area is struck by or comes down on a wave. Slamming is characterized by zones of high pressure on the hull and associated shaking of the vessel. When slamming occurs, the operator must reduce speed in order to prevent structural damage to the hull.

Mariners have long known that if the wind begins to blow on an open, calm sea, after a while waves will develop and build until equilibrium condition is reached. This phenomena was categorized by the 19th century English sailor, Admiral, Sir Francis Beaufort, KCB. The Beaufort scale matches wind velocities to wave conditions or Sea States. This terminology has been adopted to define design conditions for vessels.

For the vessel designer, sea kindliness or ride quality must be expressed as a set of standards. Because of the varying nature of winds, operating areas, seasons of the year, resistance to motion sickness, etc., this usually means that statistics must be used. To say that a vessel has to work through Sea State 3 and survive a Sea State 5 is not precise. Before defining the governing sea state one must consider where the vessel is to operate, what kinds of seas are prevalent at what times of the year, and what type of work will be done with the vessel. For example, a research vessel handling plankton nets over the side can operate in higher sea states than one that will be handling an ROV. Therefore, it is important that the designer understand the vessel's mission and its limitations.

Having looked at the environment that provides the energy input to cause vessel motion, we next look at the vessel's response. The vessel system can be modeled as a linear mass spring system with a dampener. (See Fig. 4.) The vessel is the mass, the spring is buoyancy to restore the vessel to its equilibrium position as the waves pass under it, and the dampener is the sum of friction, turbulence, and drag. The equation of a linear system takes the form of F(t) = mg +mA + cV + kD where:

F(t) = force varying over time

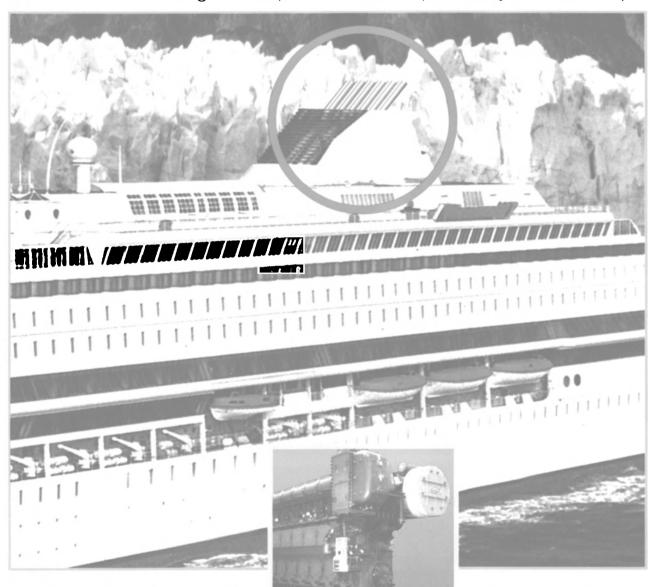
m = mass

g = acceleration due to gravity

A = acceleration of the vessel

c = damping coefficient V = velocity of the vessel

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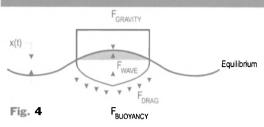
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k = buoyancyD = distance the vessel moves

Note: It is important to recognize that vessel mass is a key factor in the equation. For a given wave height, a heavy vessel will have lower accelerations or move less than a lighter weight vessel. Another factor is the damping coefficient. Adding bilge keels to a vessel increases the drag and turbulence when a vessel rolls, reducing motion. Finally, the buoyancy constant is proportional to the amount of waterplane area of the vessel. A slender spar buoy will move

less than a fat can buoy. This equation applies to each of the six degrees of freedom. Given the difficulties in solving six simultaneous differential equations, some standard simplifications are used. First, surge and sway are typically ignored since their magnitudes are usually small compared to the other motions. Yaw can be assumed to be countered by rudder steering forces, leaving roll, pitch, and heave as the primary motions of concern. For example, in roll the "spring" is the vessel righting arm. A low center of gravity due to weight in the form of ballast will produce a different ride from the same weight carried as deck cargo. Whether the ride will be better or worse will depend on factors such as hull shape, wave spectrum and weight distribution. For the latter, consider an ice skater spinning around. By changing position of the arms, the speed of the spinning can be altered, with the arms tucked in close to the body causing the highest rate of rotation. Similarly, the distribution of weight on a vessel can affect the pitch and roll performance.

Many different approaches have been tried to improve seakeeping, from fundamental differences in hull shape to active or passive appendages. A brief discussion of each of these follows:

Monohull - The traditional monohull has been the subject of much investigation for seakeeping. What we have learned is that long slender hulls have less pitching behavior, while short fat hulls are typically better in roll and heave. Deck wetness can be limited through good bow shape and hull flare. A round bilge hull will have less roll dampening than a hard chined hull. Hard chine boats can be subject to slamming in the bow area depending on the wave height and the vessel's forward speed.

Centerboards - Centerboards are typically an airfoil shape with mecha-

nisms allowing them to be retracted into the hull. Placed at approximately 30 percent of the waterline length back from the bow, they dampen rolling motion and incidentally allow sonar transducers to be placed well away from

noise sources in the hull.

Seakeeping is an important characteristic of any vessels. Motion, energy and design play key roles in the sea kindliness of a vessel. How friendly is yours?

John W. Waterhouse, P.E. received his

B.S. in Mechanical Engineering from U.C. Berkeley in 1979 and his M.S. in Naval Architecture and Marine Engineering from M.I.T. in 1984. Before forming EBDG, John worked for Nickum & Spaulding Associates as part of their preliminary design group.



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New Inland Containership Concept Unveiled

A concept design for a new inland containership — dubbed Waterborne Container Carriers (WCC) — was com-

pleted and released by DeJong & Lebet, a project that was completed for Venture Capitol Investors LLC, which owns a patent on the concept.

Designed for operating on inland waterways, WCC measures 550 x 107 x 20 ft. (167.6 x 32.6 x 6 m), with a length and beam specifically designed to fit in the Mississippi River System Locks.



Air draft is limited to 42 ft. (12.8 m) based on bridge height restrictions.

The full load draft of the vessel varies from nine ft., unballasted, to 12 ft. ballasted. The ballast is also used to maintain draft when the container load is light. The vessel's propulsion system has raising and lowering capability for shallow draft upper river operations.

The WCC is capable of carrying 566 40-ft. containers, or 1,132 TEU. The design can be modified to have some sections of the vessel set up for longer/higher boxes. The containers are stacked five high, with two levels in the hull and three levels above the main deck.

The vessel is designed to be powered by four Caterpillar 3606 diesels, 2,840 hp each at 1,000 rpm. The engines drive 360 degree Thrustmaster Z-drives, model 3000M, with type 19A nozzles, and stainless steel propellers. The vessel is designed to be operated with two engines only, when the power requirements are minimal. All Z-drives are designed for removal without drydocking. Engines are cooled using Alfa-Laval bolted plate heat exchangers.

The WCC features a pair of 550 hp bowthrusters by Schottel. The thrusters are powered by CAT 3406 E engines. Electrical power is provided by two 425 kW CAT 3412 gensets, one 170 kW CAT 3306 auxiliary genset.

The WCC is designed for U.S. Coast Guard Certification under Subchapter I. A preliminary manning analysis indicates a crew requirement of approximately 15. The vessel is designed with accommodations for 17, but could be easily expanded for 20 or more. The design also features a forward pilothouse and accommodation area, with aft machinery and engineering accommodations.

The vessel is designed to be constructed of welded steel. The design standard used is ABS Rules for Rivers and Intracoastal Waterways.

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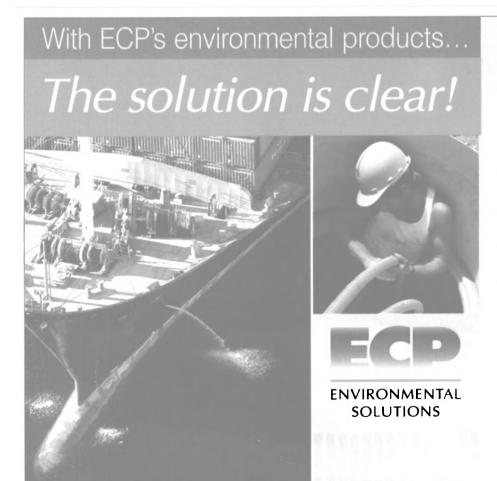
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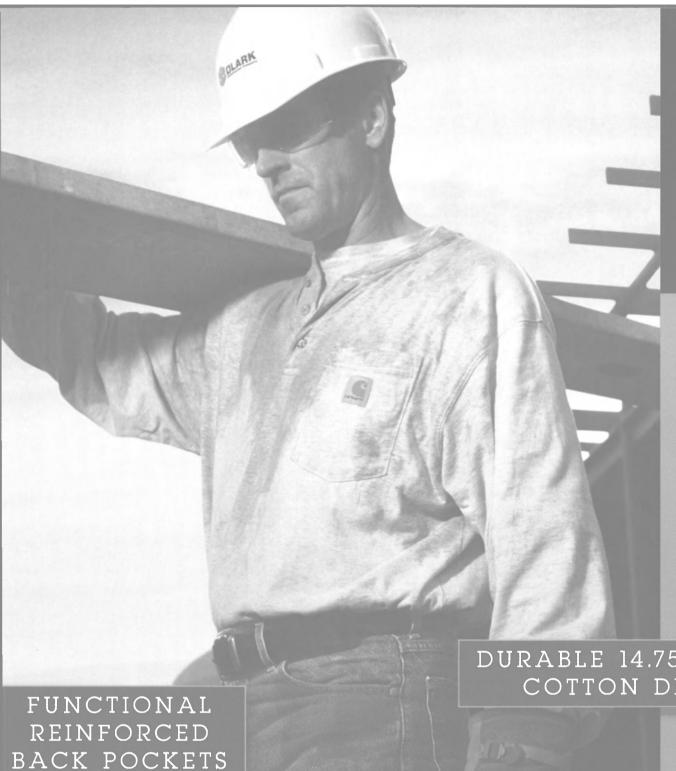
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By David Tinsley, Technical Editor

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services encompassing safety simulation and risk assessment, knowledge management and life-cycle support. Its latest endeavors form the basis of what it describes as contemporary configuration engineering and management, and extend the role and business scope of a practitioner of the latest technology tools in marine design, engineering and production.

Armed with new methodologies and products, which offer a seamless link from the design and construction period into the post-delivery stages, Deltamarin is equipped to meet an emerging market requirement for cradle-to-grave technical support, starting with the initial feasibility studies and extending through lifetime operation.

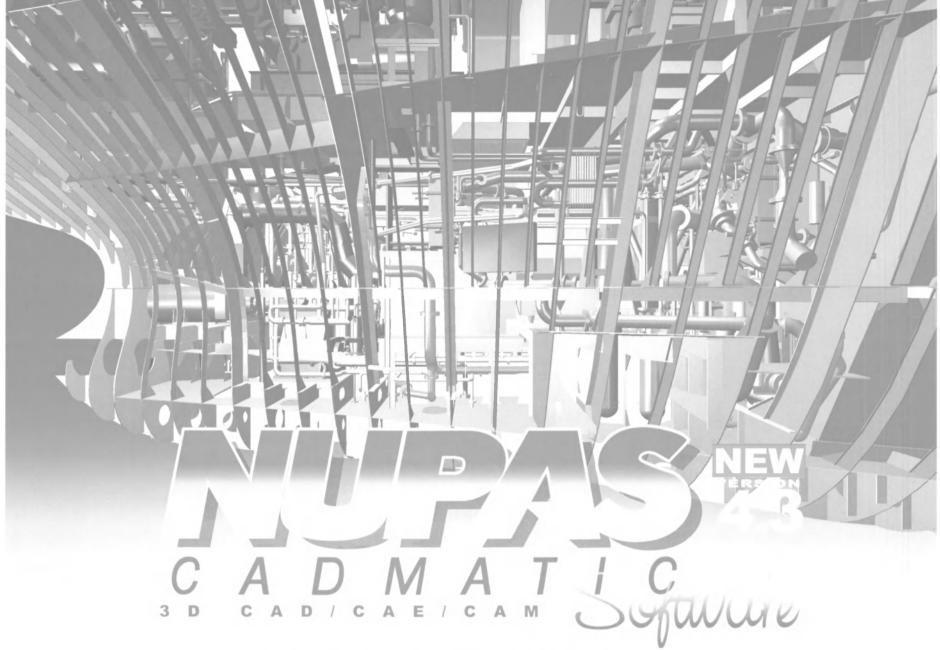
The company's first experience with a specific knowledge management system has encouraged Deltamarin to approach selected shipowner and shipyard clients with its proposed new type of service, dubbed knowledge management consultancy. The preliminary system has been used in connection with the design project for Tallink's 40,000-gt cruise ferry due for delivery next year from Aker Finnyards.

Deltamarin believes the concept could bring tremendous benefits to the industry at large, by providing an integrated, electronic model of the ship and its component parts that will assist postdelivery tasks relating to maintenance, technical procurement, refitting, repair and modification.

Pivotal to the envisioned tool is the 3-D product model and core information structure laid down and continuously refined from the early design stages of a newbuild scheme. The model is a means of better ensuring the efficiency and reducing the complexity associated with shipbuilding projects, typically involving large numbers of subcontractors. It contains all data relating to the build and outfit, including materials, structures, components and equipment, and provides an integrated working platform which is continually refined and referred to by multiple users throughout the life of the project.

In essence, the latest initiative aims to tap the resource represented by the product model to the long-term benefit of the shipowner, by using the data store as the basis for an operational lifetime model that can be continually used and updated in parallel with ship maintenance, refurbishment and modification in every shipboard technical discipline. It will provide a single, consistent source of integrated data containing the accumulated details of a ship and its throughlife technical standing. Such a system





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would also be useful in relation to future fleet newbuild schemes.

Building on its experience in simulation work, Deltamarin has also unveiled a new product known as Total Safety and Risk Assessment (TSA), developed in conjunction with Royal Caribbean International and Norwegian ferry specialist Color Line. Drawing on both owners' experience from earlier, theoretical safety assessment schemes, criteria for the new technique was that it should be systematic and comprehensive, and should yield practical results in analyzing the ship and in determining the most cost-effective ways of improving safety and service reliability.

The collaborators took the view that if the safety assessment process were to be effective and efficient, the effort required to undertake the task and implement remedial action should be minimized. Accordingly, a working procedure has been developed which can be repeated from one case to another. The new method sets out to identify all single mechanical or electrical failures or operational errors leading to a situation where the ship is incapable of fulfilling its mission.

The methodology is general and systematic in appraising the overall safety of the ship, systems, spaces, and functions onboard. It is based on two generic databases, which are used according to formal safety assessment principles (FSA). One introduces a model of the ship, describing all the essential services on board, and links functions, systems and subsystems to services. The other is an evaluation criteria database. A software application called the auditing guide assists the surveyors through the different phases and facilitates efficient management of documentation.

The classification society sector has shown serious interest in TSA. "To date, we have worked on four vessels utilizing the TSA method successfully, but in the future we intend to use it as a design tool, so that it can be applied more widely and proactively, even as a surveying tool," observed the consultancy's business development director Markku Kanerva.

In applying the methodology to newbuild projects, the process starts with analysis of the arrangement of the vessel, including location of high-risk spaces and areas, system location and routing, through to system configura-

It is felt that the major strides in technology, vessel concepts, and size and complexity necessitate a proactive approach to safety issues. "New concepts should be thoroughly tested before application," argues Kanerva, who considers that modern simulation techniques and risk-based assessment methods offer valuable opportunities for reflecting such structured analysis in a design before construction is initiated. Effective simulation tools and computer-based safety assessment open up major new potential in achieving costeffective safety improvements. As one element of the drive to use virtual-reality techniques for modeling operational scenarios, Deltamarin has developed a passenger evacuation model in co-operation with the University of Strathclyde. Code-named Evi (evacuability index), it employs a virtual environment for enhanced effectiveness in evaluating evacuation performance of ship design.

Provision of the contract design and detail design for the forward half of the 72,000 gt newbuild cruise ship ordered at Litton Ingalls by American Classic Voyages Co. (AMCV), Deltamarin is making an important technical services contribution to a seminal U.S. program. The Finnish stamp on the milestone Project America scheme, signifying a U.S. return to large, ocean-going passengership construction after a gap of 40 years, is also expressed in Elomatic's retention for the parallel design work on the aft half of the vessel. Litton Ingalls' teaming agreement with Kvaerner Masa-Yards had already generated Finnish input ranging from concept development and preliminary design to the latest production know-how.

Finnish shipbuilding's propensity for the most technically sophisticated and specialized forms of commercial vessel tonnage has given Deltamarin an important domestic platform from which to progressively develop business on the international stage.

The extension of its activities has been such that some 90-percent of invoiced sales last year were generated outside Finland.

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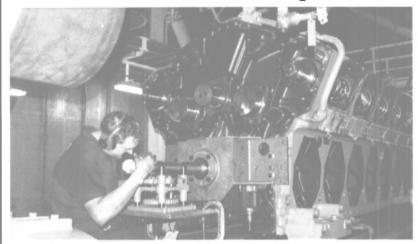
Fortum Tankers Built To Deltamarin Design

Deltamarin Ltd. is supplying the design for the tanker newbuildings for Fortum, a Nordic energy company, which are being built at Jinling Shipyard in China and at Estaleiros Navais de Viano do Castelo (ENVC) shipyard in Portugal. The project at Jinling is a product/chemical tanker with ice class 1 A Super which measures 556 x 78 ft. (169.5 x 23.8 m), with a deadweight of 25,000 and a speed of 16 knots. Total cargo tank volume is 28,000-cu.-m. The newbuil ENVC is a chemical/product tanker with ice class 1 A Super which measures 459 x 71.2 ft. (140 x 21.7 m, with a deadweight of 14,000 tons and a speed 16 knots. Total cargo capacity for this ship is 16,000-cu.-m.

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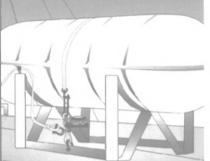
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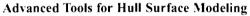
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FORAN v50: A Technological Renovation

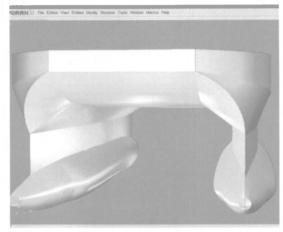
FORAN v50 was officially presented at an event organized by SENER, the second FORAN Users Meeting (FORUM 2001), which took place in Valencia, Spain, v50 was conceived with the objective of maintaining FORAN as a leader in the delivery of state-of-the-art technologies, while meeting the requirements of present and future customers. v50 covers General Design, Hull Structure, Machinery and Outfitting Design, Electrical Design and Accommodation, all developed with the emphasis on the particular requirements of Initial, Classification and Detail design for all types of ship. The main technologies and innovations that have been introduced are: Oracle Relational Database; NURBS surfaces; Object Oriented Kernel; and, Enhanced Initial Design capabilities. The propriety database of FORAN v40 has been substituted by Oracle, a standard commercial relational database. This means that the whole FORAN 3-D Product Model is now available and fully supported in Oracle, with the following very important implications, including: Open system; Platform and data independence; Facility of connectivity, hence Concurrent Engineering; Integration with ERP and other Management systems; Use of commercial tools for forms and reports; High scalability (number of users/amount of



A new Hull Form Definition module based on NURBS (non-uniform rational B-spline) curves and surfaces has been introduced, meaning that FORAN modules now use the NURBS formulation. The advantages include: Applicable to any type of hull surface; robustness and ease of use; high quality and reliability of information for construction; fast fitting and fairing tools; facilitates hull forms exchange between different systems; 3-D environment with high interactivity and quality of visualization; fast hull form definition for simple geometry; and, time for fitting and fairing processes reduced.

New System Kernel

Perhaps the most significant innovation in



FORAN v50 is the introduction of a new object oriented kernel for 3-D modeling and visualization. Completely developed using the latest object oriented technology, this new kernel is made up of a series of libraries of C++ classes, which cover all the principal basic functions of the System. Among other things, this new technology allows for advanced visualization functions, openGL standard and high performance 3D graphics cards; and advanced solid manipulation and modeling tools.

First Release

In the first release of FORAN v50 the modules to include this technology are FSURF, Hull Surfaces Definition (NURBS); and VISUAL 3-D, Walk-through Design Review; plus a series of completely new modules, which in addition to the general advantages derived from the use of Oracle, NURBS and the new kernel, incorporate many new innovations.

FORAN v50 incorporates a series of functionalities for the preliminary 3-D definition of the ship model so that from the earliest stages of the project certain budgetary estimates can be carried out. Thus, for example, calculation of work content, weights, areas and other concepts can be made, and this helps in the earliest possible definition of the product both from the technical and commercial viewpoint.

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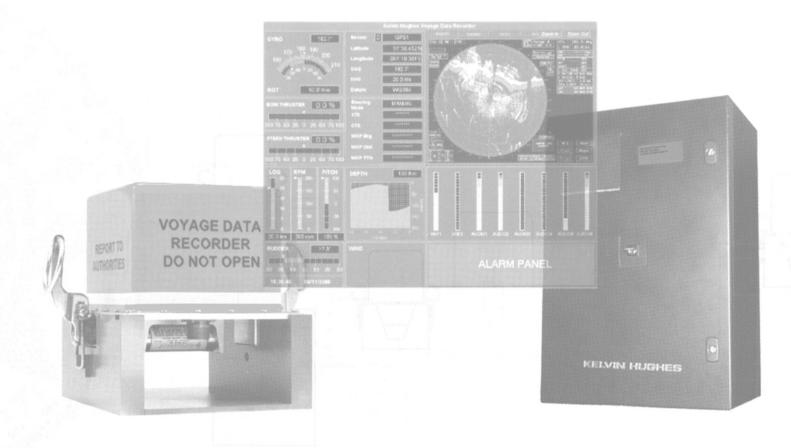
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Napa Oy Opens Office In Japan

Finland's Napa Oy has opened a Representation Office in Kobe, Japan, to strengthen the company's presence in the region. Naoki Mizutani has been

appointed manager of the Representation Office in Japan. The company is committed to playing a key role in Southeast Asia, particularly on the Japanese, Korean and Chinese markets. The Representation Office in Japan is the first in a series of local representa-

tions the company envisages in the future, in response to expansion of its customer base in Southeast Asia. Napa Oy already has an agent in Korea, namely Global Maritime Engineering. As to marketing on the Chinese market, the company has co-operation with Net-

point International, located in Shanghai.

The newly established Representation Office in Japan focuses on promoting the NAPA system through support to various marketing efforts in Japan, and on providing training and technical support services locally for present and future users of the NAPA system.

The most recent new NAPA customers in Japan and China include Hitachi Zosen Corp., Ishikawajima-Harima Heavy Industries, Mitsubishi Heavy Industries, Oshima Shipbuilding, Sanoyas Hishino Meisho Corp. and Dalian Shipyard.

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Westwood Shipping, Autoship Sign Deal

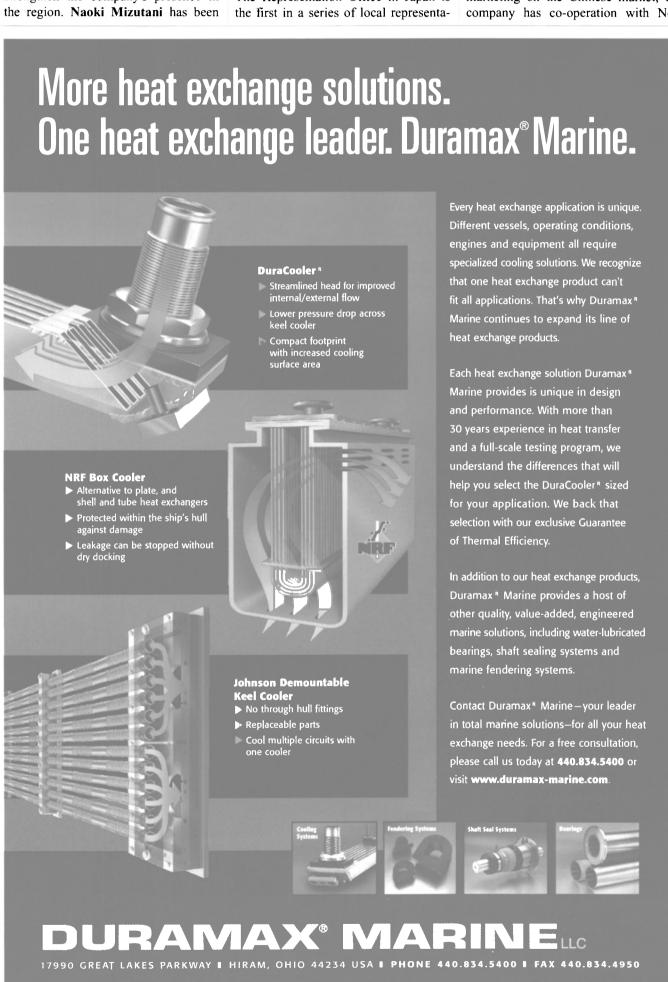
Autoship Systems Corp. signed with Westwood Shipping Lines to develop a Stowage Planning System (SPS) for seven new break bulk/container vessels. Autoship's SPS system is designed to improve the efficiency and flexibility of both stowage planning and cargo tracking operations. Fully integrated into Westwood Shipping Lines' global Business System, the software will equip each of the seven new vessels as they are delivered from Gdynia Shipyard, Poland, from March 2002 to September 2003.

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Tribon Solutions Launches New Functionality

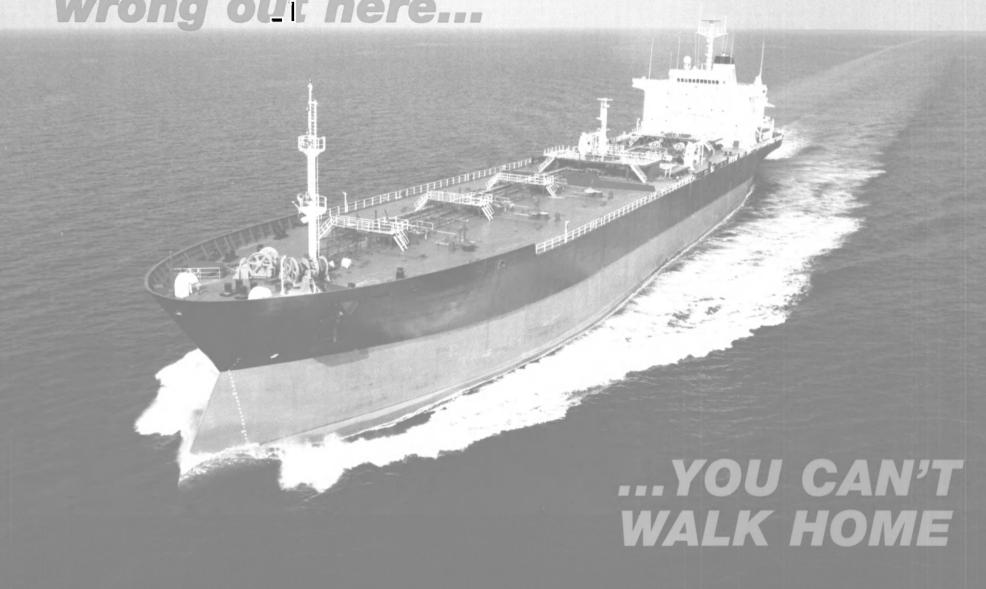
Tribon Solutions launched auction functionality of surplus material for shipyards on tribon.com. The new service enables all shipyards subscribing to tribon.com to sell and buy surplus material between each other in an easy and efficient manner. The Belfast based Shipyard Harland and Wolff, is already on line for the new service and has initiated an auction of surplus material. "The tool will provide speedy and effective access to technical information from the global supplier base and will integrate into our hull and outfitting design operations," said David Melville, Procurement Manager of Harland and Wolff Heavy Industries. "This in turn, will seamlessly flow into our procurement process, generating both time and cost savings, combined to increase the overall efficiency and competitiveness of our operations." So far 110 shipyards and 130 suppliers have signed up for tribon.com.

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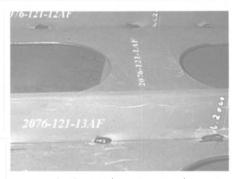
NUPAS-Cadmatic Offers V4.3

Cadmatic Users' Meeting held in v4.3 consists of many innovative new Heerenveen, the Netherlands for the pre- functions varying from helpful improve-

More than 100 users attended Nupas-sentation of the newest release v4.3.

ments in the users interface up to complete topological foundations and renewed advanced automatic plate nesting.

Nupas-Cadmatic has a new integrated module that offers the engineer a fast way to create parametric (or topological) foundations. With the help of pop-



up panels the engineer enters the parameters for the desired foundation type and picks the relations with the already engineered model. The system creates a complete 3-D foundation including all the required information for production.

In the new release Nupas-Cadmatic's unique method of applying topology has found many new applications. Creating, modifying and removing ship's structural components including its attributes has become even more efficient than before. Also, topological bevels and the application of topology on user definable entities are also possible in this release, besides the already existing topological functionality.

The automatic numbering of parts and panels has been improved and PIPS has been introduced. PIPS (Part Identify Panel System) is a new way of automatic part and panel numbering that ensures consistency and improves efficiency of the assembly of parts and panels on the workshop floor because of a unique numbering algorithm (see picture above). Besides PIPS, positioning part and panel numbers on workshop drawings is completely automated now. Production sketches have been improved as well as the automatic part description generator. The report generator of Nupas-Cadmatic supports all new additional features in the CAM modules.

Improved Automatic Nesting

A new module Advanced Autonesting offers full automatic multi-plate nesting functionality. With five new strategies including e.g. common line, multi torch and mirrored multi torch, the new automatic nesting reduces nesting time to a minimum and gives optimal results. The user can set several parameters to fine tune the yard's specific preferences for efficient plate cutting.

The former optional 'Basic Autonesting' for automatic nesting of a single plate is now standard included in the new release for all users.

Linking P&ID and 3-D model

The P&ID module data integration with the 3-D model has been further improved. This gives the advantages of selecting the correct systems, pipelines and components from the diagram layout for use in the 3-D model during the component layout and routing of the

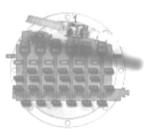
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For more than a century, Newport News Shipbuilding has designed, built, overhauled, refueled and repaired a wide variety of ships for the U.S. navy and commercial customers. NNS currently has construction contracts for the two NIMITZ class aircraft carriers, Ronald Reagan (CVN76) and the as yet unnamed CVN 77. The yard is teamed with General Dynanics' Electric Boat Corp. to build the Virginia class New Attack Submarine. NNS has completed the 3-year overhaul and refueling of the USS Nimitz and began the complex overhaul and refueling of the USS EISENHOWER in May 2001.

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Man B&W Diesel, Inc. markets and services diesel engines and related products manufactured by the MAN B&W Diesel Group. The group's parent company, MAN B&W Diesel AG is the leading supplier of large diesel engines for marine propulsion and power plants.

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pipes. The 3-D model and P&ID are checked constantly for consistency and any critical items are reported with the assistance of a new developed message server. Mistakes made by the designer are strongly reduced because of the re-use of information that is already available in the system.

Advanced Visualization

Creating fancy images and screen shots of the 3-D model is something of the past. Today, Nupas-Cadmatic supports creating on-line movie files of a virtual walk around in the model. This advanced visualization, which supports the OpenGL standard, generates on the fly (real time) rendered moving images of

Giant Industries Introduces
Bentonite Pump Line

Giant Industries introduced its line of Bentonite pumps, used for transporting the Bentonite fluid used in the stabilization of bore holes in horizon-



tal boring applications. These pumps range from 18.5 to 84.5 gpm and up to 1,500 psi. All of these pumps are made of Cast Iron fluid ends with solid ceramic plungers provide long life.

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Thrane & Thrane Introduces eCMail

Thrane & Thrane A/S has introduced eCMail, a Windows based application providing easy to use e-mail functionality for maritime and land mobile products. E-mail has become more and more popular onboard commercial vessels, fishing boats as well as yachts. Inmarsat-C is often chosen as the easiest and most cost-efficient way to communicate. To provide easy and trouble free e-mail functionality Thrane & Thrane A/S has developed eCMail, which is a Windows based Capsat application for Inmarsat-C. eCMail is very similar to Microsoft Outlook, and is designed to be easy to install and use.



eCMail works with Thrane & Thrane & Thrane A/S' existing TT-3022C Land Mobile Tranceivers, TT-3022D Fishery Transceivers as well as Thrane & Thrane A/S' Non-Solas Inmarsat-C Capsat products of the future. The new software can be downloaded free of charge directly from the Internet at www.tt.dk/ecmail

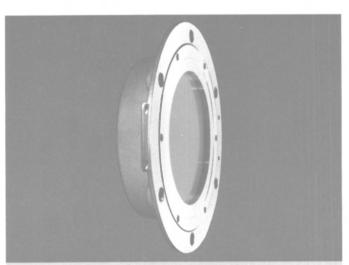
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the camera path and stores them in a standard Windows AVI file. This unique feature gives a complete new meaning to the virtual ship and opens unlimited possibilities for information exchange between shipyard and shipowner and between engineering department and production floor.

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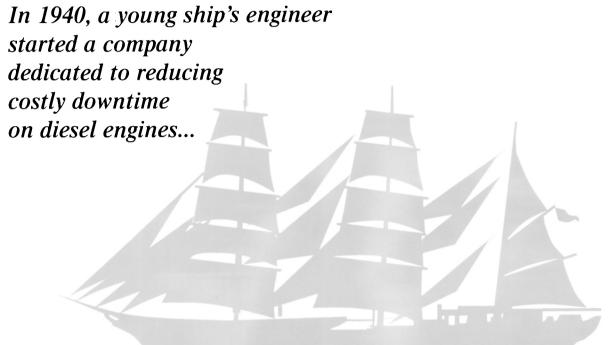
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Ship Evac Simulation Software Shows Promise

Safe, fast and efficient vessel evacuation has long been a top concern of the marine industry, a fervor sure to be renewed with vigor in the wake of last month's terrorist activities in the U.S. and heightened securities being formulated for all transportation industries. New research being carried out by British Maritime Technology (BMT) and the University of Greenwich could give ship designers and owners vital new information on how humans react



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when evacuating from ships. The hope is that this unique study will help to prevent future shipping disasters, helping to save thousands of lives.

Transport Canada commissioned BMT's affiliate, Fleet Technology to develop a ship evacuation simulation program. To collect and record data on how people behave when evacuating from a ship, they designed and constructed a purpose built experimental facility. The facility has been named SHEBA (Ship Evacuation Behavior Assessment) and the first tests began last month at Fleet Technology's Kanata laboratories, using hundreds of volunteers of different ages and backgrounds.

"This facility is the first of its kind large enough to measure group movement, enabling us to collect quality data. For example, the passageway is long enough to allow faster people in a group to overtake, and to permit us to study behavior of two groups heading in opposite directions," said Ian Glen, president of Fleet Technology Ltd and SHEBA project director.

SHEBA is being used to measure the mobility of people moving in a typical ship's passageway and up and down stairs at angles up to 22 degrees. Sophisticated modeling techniques will combine the observed studies of human performance and behavior with ship lay-



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out and system performance.

Using the results from the SHEBA study, Fleet Technology Ltd. is working in partnership with the University of Greenwich to develop a new generation of ship evacuation simulation software called maritimeEXODUS. This tool enables marine designers and inspectors to assess the effectiveness of evacuation procedures, as well as provide design recommendations for new ships. Both hope that the research will be completed

Westfalia Debuts New Separator Breed

Westfalia Separator Mineraloil Systems has introduced what it is dubbing a radically modified new separator generation, dubbed the "D" series — a line of products characterized by a modified



bowl design, which help to make the units safer and more efficient.. The D-type series is comprised of the models OSD 5, OSD 15, OSD 30 and OSD 50, a line-up designed to cover the complete application and performance range of today's shipping customers.

The new line is designed to provide improved separation efficiency, lower fresh water consumption, and maintenance intervals up to 16,000 hours, while demanding 40 percent less space and a 60 percent reduction in weight.

All self-cleaning separators of the new D-Type generation for diverse applications in oil and water treatment will operate with belt drives. By using a flat belt drive in lieu of a gear, the manufacturer delivers a unit that is easier to maintain, thanks in large part to a 30 percent reduction in the number of parts. Lower sensitivity to vibrations, low noise level and better price-performance ratio are also promised.

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in the next few months and plan to launch maritime EXODUS this autumn.

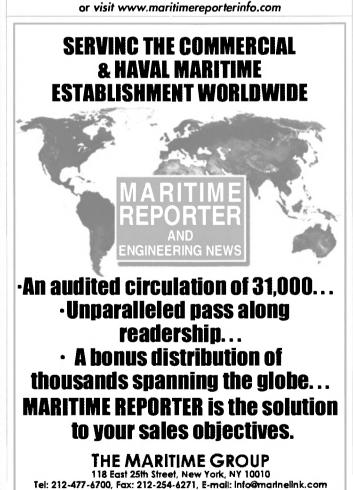
"maritimeEXODUS will be the ship evacuation and passenger modeling program against which all others will be measured. Its pedigree, and the fact that it is being offered through a leading marine engineering company who truly understand the industry's issues, backed by a full time research and development staff at the University of Greenwich make it totally unique," Glen said.

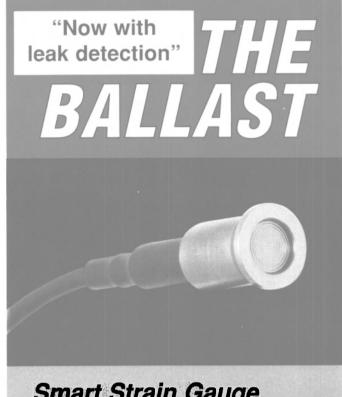
As a nation with one of the world's largest ferry fleets and with a range of passenger vessels from small ferries to cruise ships calling at its major ports.

Canada has a direct interest in effective evacuations. Canada is working with the International Maritime Organization and other nations to improve ship evacuation methods and developing tools for assessing the suitability of designs.

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Wärtsilä's Dual-Fuel Engine Power Module For FPSO Upgrade

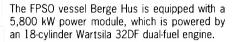
Wartsila Corporation has supplied a 5,800 kW Power Module to Bergesen d.y. Offshore AS, Norway, for installation on board the FPSO vessel Berge Hus. The Module, which is powered by a Wartsila 18V32DF dual-fuel engine,

will burn produced gas.

Currently being converted into an FPSO vessel from a VLCC tanker at the Jurong shipyard in Singapore, Berge Hus is destined for operation on the Ceiba oil field off Equatorial Guinea.

Oil was reached in the Ceiba field by another Bergesen FPSO vessel, the Sendje Berge, in November 2000.

The sister ship Berge Hus will take over work on that field in the first quarter of 2002 to complete the planned 10



production wells and four water injection wells, and continue handling the crude oil produced from the field.

In the Power Module supplied for Berge Hus, the engine is a Wärtsilä 18V32DF dual-fuel engine with a maximum continuous output of 6,030 kW at 720 rpm. The complete unit measures 17.7 x 5.4 x 6 m (or 13 m including the exhaust stack). It weighs 201 tons for transport and 225 tons when in operation with all supplies (fuel, water and lubricating oil), and has fire insulation to class A60, and a noise level of less than 85 dB(A) at one meter.

The Wārtsilā 32DF dual-fuel engine runs simultaneously on natural gas and diesel fuel oil. Natural gas is supplied at a low pressure to the engine and is taken directly from the oil/gas production. The engine is fully capable of switching over from gas to liquid fuel (marine diesel oil or gas oil) automatically should the gas supply be interrupted, while continuing to deliver full power.

The Wartsila 32DF engine was introduced in 2000 to marine applications to meet the requirements of a new safety class for installations with a gas pressure of less than 10 bar in a single-pipe arrangement.

Whereas the gas-diesel engine (as in the Wartsila 32GD type) injects highpressure gas fuel into the engine cylinders, the DF type employs gaseous fuels at low pressures. In gas mode, the DF engine operates according to the leanburn Otto process. Gas is admitted into the air inlet channels to individual cylinders during the intake stroke to give a lean, premixed air-gas mixture in the engine combustion chamber. Reliable ignition is obtained by injecting a small quantity of diesel oil directly into the combustion chamber as pilot fuel. The DF engines use a "micro-pilot" injection with less than one percent of the fuel energy requirement at nominal load.

The Wärtsilä 32DF engine is designed to deliver environmental benefits. It has low NOx emissions, about one-tenth those of the standard diesel version.

An important contribution to satisfactory running of the Wärtsilä 32DF engine comes from the application of full electronic control. It uses an electronic control system based on the Wärtsilä WECS 8000 system.

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Gratingless Air Circ System in Reefer Ships

Computer simulations and tests have been carried out by LauritzenCool and York Marine AB to confirm the suitability to distribute air in refrigerated cargo holds without gratings. The investigated grating-less concept was reportedly confirmed as successful by full-scale transports of bananas in a regular service over a period of half a year from Central America to Europe. The work has given valuable information in developing formulas and algorithms to design safe systems for grating-less holds in refrigerated ships. The innovation means savings in the investment of the ship on gratings, lower molded depth of the hull for the same capacity and a higher stability to carry containers on deck. It will also lower maintenance costs. The project

started in 1994 with laboratory work at ABB Ventilation Products to find criteria for the rate of cooling of bananas on single pallets. Soon, tests moved on to trials to determine the rate of cooling and temperature gradients in several pallets of bananas and citrus. Finally, regular shipments with bananas on pallets on the MV Ivory Dawn were carried out during a period of six months in a service from Central America to Europe.

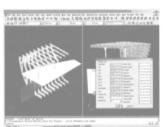
The tests and shipments have given valuable information to determine the criteria for the design and optimization of systems for gratingless holds for the next generation of refrigerated ships. Two different executions of the system were evaluated — supply of air under the pallets versus supply of air above the pallets by means

of high velocity air jets tangent to a flush ceiling. Criteria for volume, speed and pressure of the air, geometrical limitations of the cargo holds and other requirements that all give an as good as in today's conventional refrigerated ships or even better cooling rates and keeping of the temperatures of all types of produce on pallets in refrigerated cargo holds have been determined.

THE SEA SWITCH

MasterSHIP CADCAM Seminar For Shipbuilders During EUROPORT, METS

On November 12 and 13, 2001, the fifth MasterSHIP CAD/CAM seminar for ship-builders and ship designers will take place in the Netherlands. The seminar is organized by Yachting Consult. MasterSHIP helps shipyards to reduce costs, by preparing the whole ship construction in the computer, ready for NC cutting. The seminar is planned in the same week as the EUROPORT and METS exhibitions in Amsterdam, so international visitors can combine these events. This year's seminar theme is how to combine Engineering and Logistics into a profitable shipbuilding process. In one presentation will be demonstrated how the new MasterSHIP Organizer, a time saving database, helps engineers to track ship parts. Another lecture will explain the entire process of work preparation using the newest MasterSHIP 2002 release. Other presentations demon-



strate the newest examples in 3D work preparation including hull and interior construction, installations and piping routing, using software tools as AutoCAD and Mechanical Desktop. Seminar participants will also be informed on the total service concept of the Yachting Consult engineering department. On the second day two shipyards and a cutting center will be visited to see the results of this CAD/CAM approach in on going newbuilding projects. These visits offer a unique opportunity to see Dutch shipbuilding in operation and to meet shipbuilders using MasterSHIP software.

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New Technology To Debut At Europort

Europort 2001 — the 30th edition of the exhibition -- scheduled for November 13 to 17 at the Amsterdam RAI, is traditionally an event where companies from around the globe debut innovative new marine equipment and technology. While the exhibition is often considered a regional affair, the event indeed fulfills its international billing with a roster of more than 550 companies from around the globe, and halls filled with ship owners and operators with an equal international distribution. In 1999 exhibition management stated that the event drew more than 30,000 visitors from 88 countries.

This year's event will offer a few extras, including a special focus on inland shipping. There are plans for numerous companies to exhibit their wares to this sector scattered throughout the exhibition floor, and the inland shipping sector will also occupy a prominent position in the specially equipped simulator pavilion.

The 2001 edition of the event, (which

is held every two years) will fulfill its reputation, as the following companies will offer new innovations in Amsterdam. Transas Marine will introduce its latest developments in the fields of electronic chart systems, maritime simulation and vessel traffic services. Navi-Sailor 3000 will be on display to demonstrate the new-generation technology developed for Transas navigation solutions. This system incorporates all the functionality of the previously typeapproved Transas ECDIS with an additional array of innovative, state-of-theart features. Significant new capabilities offered by Navi-Sailor 3000 include integrated weather forecasting, multiple chart display and user-selectable screen layout; advanced Route Planning, Radar Overlay and Playback facilities; North-Up/Course-Up/Head-Up chart display modes; Relative and True Motion display; and advanced (U)AIS transponder interface. At the show, Transas will unveil the new modern hardware designed specifically for the Navi-Sailor

navigation systems. The updated hardware solutions from Transas are available as full-size pedestal mount and desktop consoles. ABB Marine & Turbochargers will, among other equipment, highlight the ABB CRP (Counter Rotating Propeller) azipod propulsion. This is a steerable azipod unit mounted immediately behind the standar propeller. Located on the same axis, but without any physical connection, the pulling propeller of the pod will contrarotate in relation to the shaft-driven main propeller. Bas Engineering AS (represented by Design Systems & Technologies) will exhibit its Ship-Weight engineering software, which is used for estimation and tracking weight and center of gravity for all types of vessels. HydroComp Inc. (also represented by Design Systems & Technologies) will show visitors the latest updates to its suite of advanced design programs. including NavCad, PropExpert and PropCad. NavCad allows personal development of custom solutions within a variety of programming environments. Radio Holland Marine will offer its RHRS-2005RCTFT river radar with LCD/TFT daylight-bright rasterscan, 18.1-in. multi-color, high-resolution display. Also on display will be the company's Ship@Sight monitoring of ships via the internet, a system that provides fleet and ship data such as name, ID, position, course and speed. Thrane & Thrane's Inmarsat F1 terminal provides high-speed MPDS service, enabling users to be on-line around the clock while only being charged for the data transferred over the satellite connection.

Europort 2001 Facts & Figures

November 13-17, 2001 Dates 11 a.m. - 6 p.m. except Thursday, Nov. 15, 11 a.m - 9 p.m. # Exhibitors Admission abt. \$16 Internet www.europort2001.com



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HAM 318 Hits Water In Big Way

A mammoth trailing suction hopper dredger, built by IHC Holland NV in cooperation with Van de Giessen - du Noord, was launched earlier this year to rave reviews, and was anticipated to be delivered and working this month. The vessel, which joins the company's 16 other trailing suction hopper dredgers, measures 557.7 x 105 ft. (170 x 32 m) and boasts an installed power of 28,500 kW, with a hopper capacity of 23,000 cu. m. and a maximum dredging depth of 364 ft. (111 m) — all numbers which easily rank it as the king of the HAM fleet and make it more powerful and capable by a factor of two.

Rotterdam-based HAM is one of the world's leading dredging companies, but is active in many marine related fields including: construction and maintenance of harbor infra-

structure and waterways; land reclamation; coastal and embankment protection; offshore services; environmental activities; rock drilling and blasting; and irrigation work.

HAM 318 Main Particulars

Type	. Trailing suction hopper dredger
Year built	
Length, o.a.	557.7 ft. (170 m)
Molded depth	
Dredging draft	42.6 ft. (13 m)
Hopper capacity	
Dwt	
Max. dredging depth	
# Suction pipes	
Speed, loaded	17.3 knots
Total power	
Pump drive	2 x 5,500 kW
Discharge systemBottom de	pors or connection to floating pipe
Accommodation	

Novenco Announces Major Firefighting Breakthrough

Novenco Hi-Pres introduces its new XFlow technology, which it reports offers faster and safer extinguishing of engine room fires. The system utilizes years of proven technology, along with a well-designed mix of very fine water droplets and water mist. "The droplets 'cool' down the fire and extinguish it," said Allan Graff, sales manager for Novenco Hi-Pres. "The mist encapsulates it and thus 'suffocates' the fire by keeping out the oxygen. At the same time, the droplets stabilize the mist, making it stay exactly where the problem is. The result is efficiency; a both fast and gentle fire extinction with a maximum of precaution, taken to the machinery and other vital installations."

In addition to fast and efficient fire extinguishing, the system was designed to minimize maintenance and maximize economy. With this in mind, the system was designed as a fairly low pressure system, making it possible to use standard piping and to keep power consumption low, making it possible to connect to any emergency generator.

Novenco Hi-Pres is a part of the York-Refrigera-

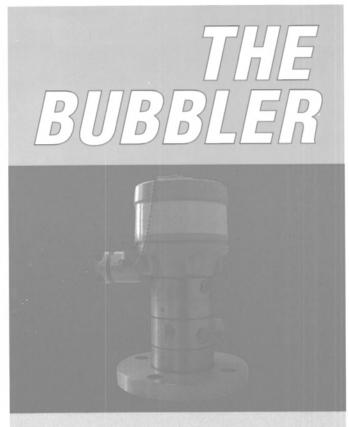
tion group, and is the Group's worldwide supplier of HVAC and firefighting systems for the marine industry.

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Schottel Displays Propulsion Innovation

German-based Schottel develops, designs, builds and delivers innovative propulsion and maneuvering systems with power ratings of up to 30 MW for maritime applications. At Europort in Amsterdam, Schottel will show its range of products and services, including: Rudderpropellers up to 6,000 kW; Twin-Propellers up to 3,500 kW; Navigators up to 1,000 kW; SSP Propulsors up to 30 MW; Pump-Jets up to 3,500 kW; Transverse Thrusters up to 3,400 kW; controllable-pitch propeller plants up to 30,000 kW, including shafting, rudder systems, and remote control devices, as well as tailor-made steering and control systems. The main exhibits are a Pump-Jet of type SPJ 57 RD and a Schottel Twin Propeller of type STP 200.

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The Bubbler is an electro-pneumatic level transmitter that allows remote level measurement using a 4-20mA analog output. The lack of air pressure poses no operational problems, due to an automatic one-way valve which closes as soon as the pressure drops below 1 bar, this prevents back flow in the bubbling line towards the transmitter. Over pressure is also protected against by an automatic one-way valve.

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Lykes Lines Upgrades Services

The launching of Lykes Runner on August 29, rounds out the retonnaging of Lykes Lines' North America — Africa Service, East Coast Loop.

This multi-purpose Astrakan Mark 3

RoRo ship joins four sisterships already on the service, operating every two weeks between Canada, the U.S. and South Africa — all of which can carry breakbulk, bulk and container traffic — including refrigerated cargo.

BP Exploration To Merge Into Amoco Oil

Effective October 1, 2001, BP Exploration & Oil Co. will merge into Amoco Oil Company. Subsequent to this trans-

action, the name of the surviving legal entity Amoco Oil Company will be changed to BP Products North America Inc.

KVH Appoints Bookataub COO

KVH Industries has appointed S. Joseph Bookataub as its new COO. Bookataub brings extensive experi-



ence in the areas of ISO procedures and certification, and supply chain management, as well as procurement and quality assurance. He most recently served as vice president of Manufacturing for Mayan Networks, an optical networking firm in San Jose, Calif.





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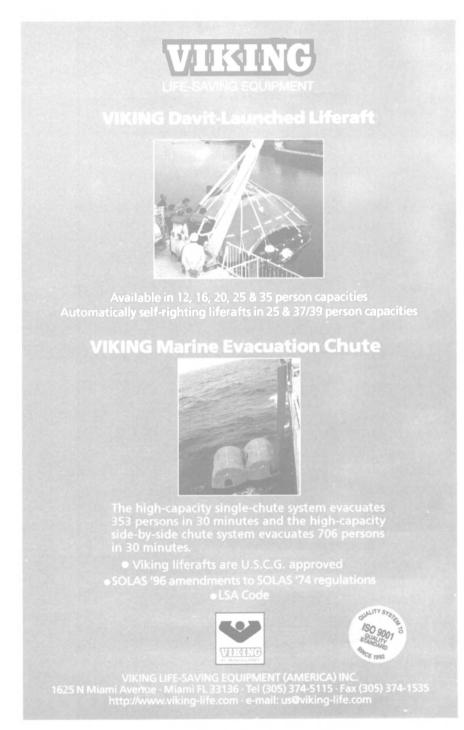
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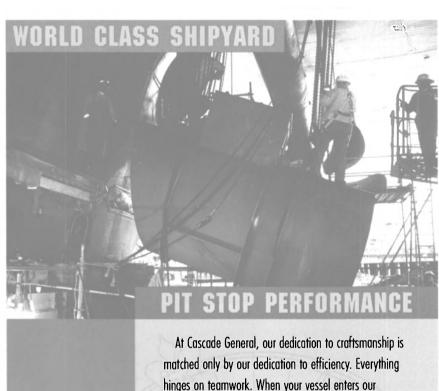
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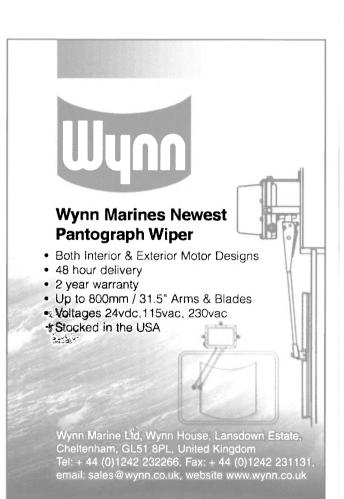
Following are corrected details from the Diesel Engine Directory as presented in the July 2001 edition of Maritime Reporter & Engineering News.

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Falckensteiner Str. 2, 24159 Kiel/Germany Ph. +49 431 3995 01, Fax +49 431 3995 2193

e-mail: ju_marketing@CAT.com, Website: www.mak-global.com

Model	Bore (mm)	Stroke (mm)	Cyl.	kw/cyl.	Rpm	Bmep	Model	Bore (mm)	Stroke (mm)	Cyl.	kw/cyl.	Rpm	Втер
MaK 6 M 20	200	300	6	170	900	24.1	MaK 16 M 32 C	320	420	16	480	720	23.7
MaK 6 M 20	200	300	6	190	1000	24.2	MaK 16 M 32 C	320	420	16	500	750	23.7
MaK 8 M 20	200	300	8	170	900	24.1	MaK 6 M 43	430	610	6	900	500	24.4
MaK 8 M 20	200	300	8	190	1000	24.2	MaK 6 M 43	430	610	6	900	514	23.7
MaK 9 M 20	200	300	9	170	900	24.1	MaK 7 M 43	430	610	7	900	500	24.4
MaK 9 M 20	200	300	9	190	1000	24.2	MaK 7 M 43	430	610	7	900	514	23.7
MaK 6 M 25	255	400	6	300	720	24.5	MaK 8 M 43	430	610	8	900	500	24.4
MaK 6 M 25	255	400	6	308	750	24.2	MaK 8 M 43	430	610	8	900	514	23.7
MaK 8 M 25	255	400	8	290	720	23.7	MaK 9 M 43	430	610	9	900	500	24.4
MaK 8 M 25	255	400	8	300	750	23.5	MaK 9 M 43	430	610	9	900	514	23.7
MaK 9 M 25	255	400	9	290	720	23.7	MaK 12 M 43	430	610	12	900	500	24.4
MaK 9 M 25	255	400	9	300	750	23.5	MaK 12 M 43	430	610	12	900	514	23.7
MaK 6 M 32 C	320	480	6	480	600	24.9	MaK 16 M 43	430	610	16	900	500	24.4
MaK 8 M 32 C	320	480	8	480	600	24.9	MaK 16 M 43	430	610	16	900	514	23.7
MaK 9 M 32 C	320	480	9	480	600	24.9	MaK 18 M 43	430	610	18	900	500	24.4
MaK 12 M 32 C	320	420	12	480	720	23.7	MaK 18 M 43	430	610	18	900	514	23.7
MaK 12 M 32 C	320	420	12	500	750	23.7							



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AIS: The Future is Now

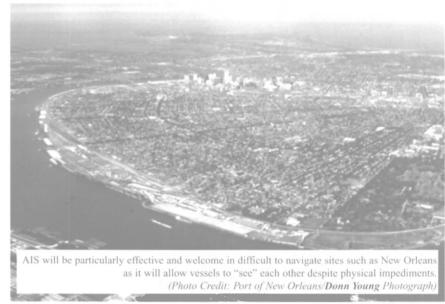
The IMO deadline for fitting new ships with Automatic Identification Systems (AIS) is less than one year away. After July 1, 2002, all newbuilds over 300 grt must be equipped with an approved AIS transponder system. Leica Geosystems, one of the pioneering companies in AIS technology, recently published a 28page book ("A Complete Guide to Automatic Identification Systems") that is loaded with useful information on AIS technology, how it works, international standards and carriage requirements. At the Norshipping exhibition in Oslo, Leica unveiled the first fully integrated GPS/DGPS/AIS shipboard system meeting all IMO, IEC and ITU equipment specifications. The following extracts are reprinted with permission from Leica Geosystems.

What is AIS?

AIS is a shipboard broadcast transponder system in which ships continually transmit their ID, position, course, speed and other data to all other nearby ships and shoreside authorities on a common VHF radio channel. AIS is designed to operate in one of the following modes:

- In a ship-to-ship mode for collision avoidance
- As a means for coastal states to obtain information about a ship and its cargo
- As a traffic management tool when integrated with a Vessel Traffic System (VTS)

The primary operating mode for AIS will be autonomous ship-to-ship reporting. In this mode, each ship transmits its data to all other AIS-equipped ships within VHF range. The unique communications scheme permits these data transmissions to take place independently without the need for a master control



station

Position and other data are fed automatically from the ship's sensors into the AIS system, where the data is formatted and transmitted in a short data burst on a dedicated VHF channel. When received on the other ships, the data is decoded and displayed for the officer of the watch, who can view AIS reports from all other AIS-equipped ships within range in graphic and text format. The AIS data may optionally be fed to the

ship's integrated navigation systems and radar plotting systems to provide AIS "tags" for radar targets. The AIS data can also be logged to the ship's Voyage Data Recorder (VDR) for playback and future analysis.

In coastal waters, shoreside authorities may establish automated AIS stations to monitor the movement of vessels through the area. These stations may simply monitor AIS transmissions from passing ships, or may actively poll ves-



sels via the AIS channels, requesting data such as identification, destination, ETA, type of cargo and other information. Coast stations can also use the AIS channels for shore-to-ship transmissions, to send information on tides, notices to mariners and local weather forecasts. Multiple AIS coast stations and repeaters may be tied together into Wide Area Networks (WAN) for extended coverage. AIS data can be logged automatically for playback in investigating an accident, oil spill or other event.

When integrated with shore-based vessel traffic systems (VTS), AIS can augment traditional radar-based VTS installations, providing an AIS "overlay" on the radar picture, or can provide a cost-effective alternative in areas where it is not feasible to establish radar-based systems. When integrated with radar, the AIS can ensure continuous coverage, even when the radar picture is degraded by heavy precipitation or other interference. The VTS center can assume control over the assignment of timeslots for AIS messages to ensure optimum data exchange within the coverage area. Special dedicated channels may be designated for localarea AIS operations. The shipboard AIS equipment will have the ability to shift to different channels automatically when directed by the shoreside VTS controller.

AIS Communications Scheme

AIS messages must be updated and retransmitted every few seconds at a minimum, since the usefulness of the data decays rapidly as a function of time. To accommodate this high update requirement, AIS uti-

lizes a unique self-organizing time-division multiple access (STDMA) data communications scheme, which uses the precise timing data in the GPS signals to synchronize multiple data transmissions from many users on a single narrowband channel.

Each ship broadcasts its AIS messages and receives messages from all ships within VHF radio range. The area in which AIS messages can be received is called the ship's "cell". Each ship is the center of its own



communication cell. The practical size of the cell can be varied according to the traffic density on the AIS channel. If the number of AIS messages begins to overload the network, the ship's AIS system can automatically shrink its cell by ignoring weaker stations further away in favor of those nearby.

Under the STDMA protocol, each minute of time is divided into 2,250 timeslots. An AIS report fits into

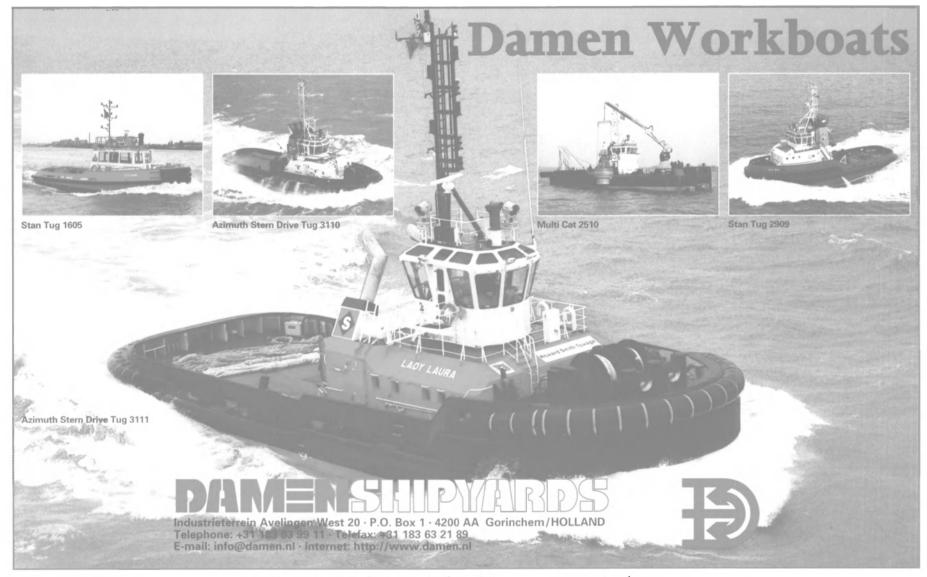
one or several of these 2,250 timeslots, which are selected automatically based on data link traffic and projections of future actions by other stations currently on the network. When a ship first enters the cell of another ship, it takes an unoccupied timeslot. The AIS stations continually synchronize their slot selections with each other. Special provisions are made for automatic conflict resolution in the event two stations end up in the same timeslot, to ensure that stations always choose unoccupied slots.

The key to the STDMA scheme is the availability of a highly accurate standard time reference, to which all of the stations can synchronize their timeslot assignments, in order to avoid overlap. This time reference is supplied by the precise timing signal in the GPS satellite message. Thus, GPS plays a critical role in AIS, providing the universal time reference as well as positioning data for each ship.

The International Telecommunications Union (ITU) has designated two dedicated frequencies for AIS. They are 161.975 MHz (marine band channel 87B) and 162.025 MHz (channel 88B). In some parts of the world, such as the United States, where these frequencies may not be available for AIS, other channels may be designated.

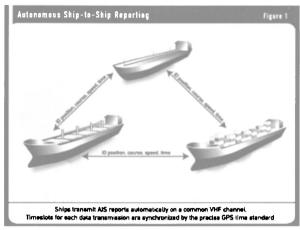
AIS Messages

AIS is designed to work autonomously and continuously in a ship-to-ship mode, but the specifications provide for switchover to an "assigned mode" for operation in an area subject to a competent authority responsible for traffic monitoring, with the data trans-



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Electronics Update



mission intervals and timeslots set remotely by the shoreside authority. Alternatively, the AIS can work in a "polling mode" in which the data transfer occurs in response to interrogation from another ship or shore station.

Information provided by the AIS falls into several categories (1) static data, such as call sign and name, length and beam, type of ship and location of the GPS antenna on the ship; (2) dynamic data, such as current position, time, course and speed over ground, heading and navigation status; (3) voyage-related data, such as ship's draft, type of cargo, destination and ETA; and (4) safety messages.

Dynamic information is derived from interfaces with the ship's GPS and other sensors. Static information is programmed into the unit at commissioning. Voyage-related data is entered manually by the master through a password-protected routine. Safety messages can be inserted at any time by the ship or shore station. The update rates for dynamic information will depend on the ship's status and speed. For instance, a ship at anchor will transmit every three minutes, while a ship underway at high speed will transmit every two seconds.

AIS Shipboard Equipment

IMO Resolution MSC.74(69), Annex 3 states that an approved shipboard AIS system shall be able to perform the following functions:

- Automatically provide information on the ship's identity, type, position, course, speed, navigational status and other safety-related matters to appropriately equipped shore stations, other ships and aircraft.
- Receive automatically such information from similarly fitted ships.
- Monitor and track ships.
- Exchange data with shore-based facilities.

A shipboard AIS system consists of the following elements:

• An STDMA radio transponder with two VHF receivers and one transmitter (it is also possible that the transponder have a Digital Selective Calling (DSC) receiver tuned to Channel 70). The radio receivers are tuned to the two AIS frequencies.

- * A control and display unit, which includes the communications processor and interfaces for taking inputs from the ship's navigation sensors and sending outputs to external systems, such as ECDIS, ARPA, VDR or Inmarsat terminal.
- One or more GPS/DGPS receivers that provide position information as well as the precise

time base needed to synchronize the STDMA data transmissions.

Carriage Requirements

The IMO carriage requirements will apply to:

- * all ships of 300 gt and upwards engaged on international voyages
- cargo ships of 500 gt and upwards not engaged on international voyages
- all passenger ships irrespective of size

Newbuilds must be fitted with an approved AIS after July 1, 2002. Existing ships engaged in international voyages constructed before July 1, 2002, must be fitted according to the following timetable:

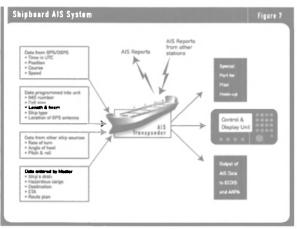
- In the case of passenger ships, not later than July 1, 2003
- In the case of tankers, not later than the first safety equipment survey after July 1, 2003

- In the case of ships other than passenger ships and tankers of 50,000 gt and upwards, not later than July 1, 2004.
- In the case of ships other than passenger ships and tankers of 10,000 to 50,000 gt, not later than July 1, 2005.
- In the case of ships other than passenger ships and tankers of 3,000 to 10,000 gt, not later than July 1, 2006.
- In the case of ships other than passenger ships and tankers of 300 to 3,000 gt, not later than July 1, 2007.

Existing ships not engaged on international voyages constructed before July 1, 2002, must be fitted not later than July 1, 2008. A flag state may exempt ships from complying with the carriage requirements if the ships will be removed permanently from service within two years of the implementation date.

Non-SOLAS Vessels

The AIS carriage requirements apply only to commercial vessels subject to the Safety of Life at Sea (SOLAS) convention. In some areas, such as inland rivers, which carry heavy commercial traffic, it is likely that port states will expand the AIS carriage requirements to include other craft, such as tug-barge combinations. Likewise, some nations



may decide to use AIS technology to monitor fishing in their littoral waters by requiring commercial fishing vessels to be equipped with AIS.

There is considerable discussion in maritime circles about developing a sort of "mini-AIS" — simplified transponders that could be installed on non-SOLAS vessels.

These devices might be shorter-range combined transmit/receive devices transmitting limited information at a reduced update rate, or in some cases "receive-only" terminals- receiving and displaying AIS data from other vessels, but not transmitting STDMA data. Specifications are yet to be determined for these types of equipment.

To obtain free copies of the book from Leica:

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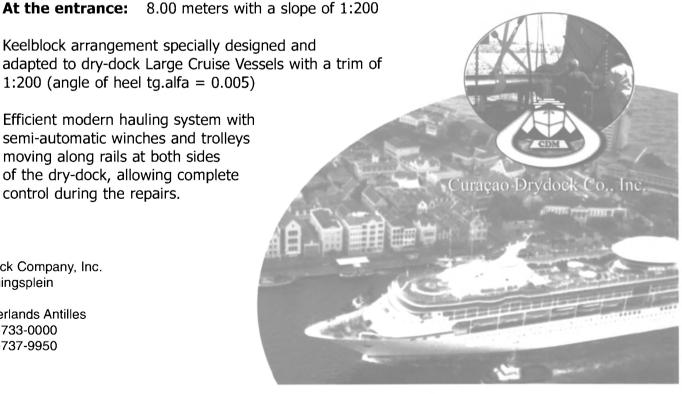
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New & Notable

Euroferrys' Fast Ferry Features Cat 3618 Power

The world's largest diesel powered fast catamaran ferry has entered service for Spanish operator Euroferrys and is now working on a route between Algeciras in southern Spain and Ceuta the Spanish principality on the north African coast, across the strait of Gibraltar.

Euroferrys Pacifica is a 331 ft. (101 m) car ferry, which is the largest of Austal's flagship Auto Express type vessel and the largest high-speed catamaran in the world with diesel propulsion.

With an immersed hull length of 291 ft. (88.7 m), molded beam of 87 ft. (26.6

m) and hull draft of 14 ft. (4.2 m), Euroferrys Pacifica has a passenger capacity of 951 passengers and 251 cars. The propulsion package comprises 4 x Caterpillar 3618 engines, 4 x Reintjes VLJ6831 gearboxes and 4 x Kamewa 125 SII waterjets. The vessel's cruising speed, with a full complement of passengers and vehicles, is 37 knots.

The four Caterpillar 3618 engines are each rated for fast commercial vessel service at 7,200 bkW (9,770 mhp) at 1,050 rpm. The 333 liter, V18 cylinder, 4-stroke Cat 3618 diesel engine weighs



Euroferrys Pacifica has a passenger capacity of 951 passengers and 251 cars. Its propulsion package comprises 4x Caterpillar 3618 engines, 4x Reintjes geaboxes and 4x Kamewa 125 SII wateriets

36,000 kg and delivers one of the lowest levels of fuel consumption — 1,707 liters per hour at rated speed — of any high performance engine in the world.

A new Austal design innovation is a hoistable vehicle deck, which runs the entire length of the vessel, maximizing the capacity to carry private vehicles and commercial/freight vehicles. This hoistable deck has four hydraulically operated sections, which can be operated together or independently and can be raised or lowered in less than one minute.

The Auto Express 101 also has a 15ton axle load — an increase on the 12ton axle load of previous vessels — and 3.5 meter lane widths as well as bow doors which allow full utilization of the 341 freight lane meters on board.

The vessel's total vehicle deck offers approximately 1,190 lane meters (including the 341 freight lane meters) and typical vehicle mix aboard the Euroferrys Pacifica would comprise 251 cars or 96 cars and 16 semi-trailers or 20 trucks

The vessel will be operating for 14 hours a day during peak season, with two interchangeable crews working for seven hours each.

All servicing and maintenance work on the Caterpillar engines will be carried out by engineers from Spanish Caterpillar dealer Finanzauto who have established a special workshop within the port of Algeciras in order to provide scheduled maintenance work and 24-hour emergency cover to support the Euroferrys operation.

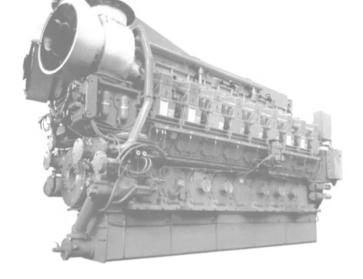
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USNS Pomeroy Joins Military Sealift Fleet

USNS Pomeroy was delivered as the seventh of eight Watson-class ships to the U.S. Navy's Military Sealift Command on August 14. Measuring 950 x 105 ft. (289.5 x 32 m), Pomeroy is a large, medium-speed RoRo (LMSR) ship that was built at NASSCO in San Diego, Calif.

The LMSR has 380,000 sq. ft. of cargo capacity, which will be loaded (in Mid-December) with tanks, vehicles and other U.S. Army equipment. Pomeroy will the depart the U.S. for Diego Garcia in the Indian Ocean where it will spend approximately 30 months on station prepositioning its Army cargo.

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PRI Fuel Treatment Helps Meet Emissions Challenges



Power Research Inc. (PRI) is a manufacturer of industrial grade fuel treatments designed to treat heavy fuel oil, diesel and gasoline. Founded in 1985, PRI chemistries incorporate proprietary thermal stability technologies that permit cleaner combustion, reduced emissions, and prevention of deposits on engine components and boiler tubes.

PRI offers PRI-R, a heavy fuel oil treatment that overcomes operability issues associated with carbon, vanadium, sulfur and sludge. First, PRI-R is a maintenance product. PRI-R has been proven to prevent carbon and vanadate deposits results in extended time between component overhauls, hence providing added value and reliability to our vessel owners, increasing bottom line profitability. PRI-R has also been tested independently and found to reduce smoke opacity, NOx and SO2.

A 1992 evaluation of PRI-R on an RTA Sulzer (380 cST fuel oil) provided NOx reductions exceeding 21 percent, with SO2 reductions topping 10 percent. Fleet managers who have incorporated the product have reported advantages ranging from double exhaust valve service time between overhauls on medium and slow speed engines, to turbo blades that remain deposit free and waste-heat boilers that are free from soot build-up.

Power Research Inc. also offers PRI-SOLV, a highly concentrated sludge control treatment that has been found to reduce heavy fuel oil

sludge by more than 50 percent.

PRI-R and PRI-SOLV are used in a wide variety of propulsion applications, including steam turbines, low- and medium-speed diesels, aboard tanker and bulker fleets, container and RoRo vessels and cruise ships.

Another product, PRI-D, is an industrialgrade diesel MDO and MGO treatment. Proven to reduce smoke opacity emissions from diesel engines as much as 50 percent, PRI-D enjoys widespread application in both commercial and recreational marine. PRI-D is marketed as a fuel stability chemistry, to preserve fuel freshness, while capable of restoring the most severely degraded fuels to refinery freshness. PRI-D also dissolves slime and sludge resulting from algae growth, and prevents hard carbon deposition on all engine types, hence extending engine component overhaul times. PRI-D has endorsements by engine manufacturers, has been extensively tested for safety and effectiveness under Nuclear Regulatory Commission (NRC) guidelines for use in standby diesel powered generators at nuclear power facilities.

PRI-D is the choice of many wholesale fuel distributors for bulk fuel treatment in upgrading diesel fuel to the premium category. Power Research Inc.'s commercial marine clients include tug and ferry fleets, commercial and sport fishing vessels, excursion passenger vessels, work boats, harbor barges, oceanographic vessels, among many others.

PRI-G is a gasoline fuel treatment — again designed to permit the cleaner combustion of all gasoline types.

As fuel prices rise, the company has seen more operators change from 180 cST bunkers to 380 cST bunkers, hence affecting operating reliability of medium speed diesels in certain

areas. Additionally, there is heightened interest in emissions control mechanisms, with marine diesel engine manufacturers exploring new design options.

There will be limits as to the degree these design changes can positively affect emissions reductions, and we believe that fuel quality enhancement through proper treatment will play an increasing role in these emissions control efforts.

A Burgeoning Market

Owner interest in fuel treatment has grown in recent years. This reflects trends in certain ports toward degraded fuel quality, and increased interest in propulsion system reliability, particularly in overcoming charter hire loss. Power Research Inc. expects continued brisk growth over the next several years, owing to continued trends in fuel quality degradation in certain areas, and heightened owner interest in

exploring new ways to improve operating reliability while cutting maintenance costs.

Emissions reductions will play a much larger role, and our extensive work in this area and documentation through independent evaluations provides excellent positioning for PRI-R as the emissions control solution. Key to our expansion is our proprietary technology — already proven to reduce smoke opacity, NOx and SO2

Power Research Inc. has positioned itself to prosper by working closely with shipboard and onshore personnel. As a manufacturing and research organization, Power Research Inc. has extreme flexibility in formulating and tailoring the product line to meet specific needs.

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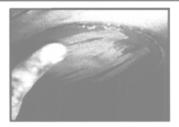


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October, 2001

New & Notable

Western Towboat Gets A New Titan

This past June, Western Towboat launched its largest piece of high-performance machinery to date: the 120-ft (36.6 m) Gulf Titan. The vessel, which

is 12 ft. (3.7 m) longer than Western's two previous builds, the Western Titan and Pacific Titan, was built with design assistance from Jensen Maritime, Seattle. The added length will improve seakeeping characteristics and increase fuel capacity by 40,000 gallons (151,600 L),

according to the company. In addition, a new five-blade propeller design with added pitch is expected to coax an extra 2,000 lbs. of bollard pull from the twin Z-drive propulsion system with high-performance nozzles.

Gulf Titan was to enter service in late-



July, towing a 14,000 long ton displacement combination railcar/container barge between Seattle and Whittier, Alaska. Propulsion power comes from two Cat 3516B High Displacement marine diesel engines supplied by N C Power Systems, Seattle. Each electronically controlled Cat engine is rated 2,260 bhp (1,686 bkW) at 1,600 rpm, and drives an Ulstein Z-drive with Nautican propeller and nozzle.

Gulf Titan is equipped with a Norwegian Rapp-Hydema tow winch holding 2,600 ft. (793 m) of 2.25 in. (57 mm) wire. Two 1,800 rpm Cat 3306B engines provide auxiliary power: one turns a refurbished Cat 135 kW generator, and the other powers a 120 kW Newage generator and a front-engine PTO-mounted hydraulic drive for the tow winch.

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Length	120 ft. (36.6 m)
Beam	
Operating Draft	
Bollard Pull	140,000 lbs. (63.6 metric tons)
Fuel Capacity	140,000 gallons (530,600 L)
Propulsion Engines	2 X Cat 3516B, each rated 2,260
bhp (1,686 bkW) at	1,600 rpm

Propulsion System .2 X Ulstein 2000HD azimuthal stern drive systems

Propellers .2 X Nautican 5-blade, skewed, stainless steel

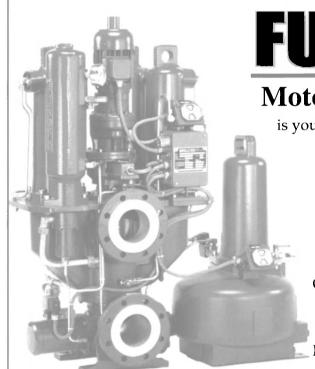
Auxiliary Engines 2 X Cat 3306B, with one Cat generator rated 135 ekW

Munson Delivers Packcat Landing Craft

William E. Munson Co. delivered a 30 x 10 ft. (9.1 x 3 m) Packcat landing craft to Moss Landing Marine Labs. Designed as a student research platform, the all welded aluminum vessel is outfitted with a $7 \times 7 \times 6$ -ft. (2.1 x 2.1 x 1.8 m) wheelhouse, two roof mounted captain seats, head compartment with 20 gallon holding tank and 150-gallon fuel system. Twin 150 hp Mercruiser diesel inboard-outboards provide a top speed of 35 mph. Equipped with a hinging radar mast, which allows the vessel to pass under low bridges at high tide, the Packcat's innovative tunnel hull catamaran design incorporates twin 16 degree vee hulls providing increased stability, exceptional rough water performance and shallow draft.

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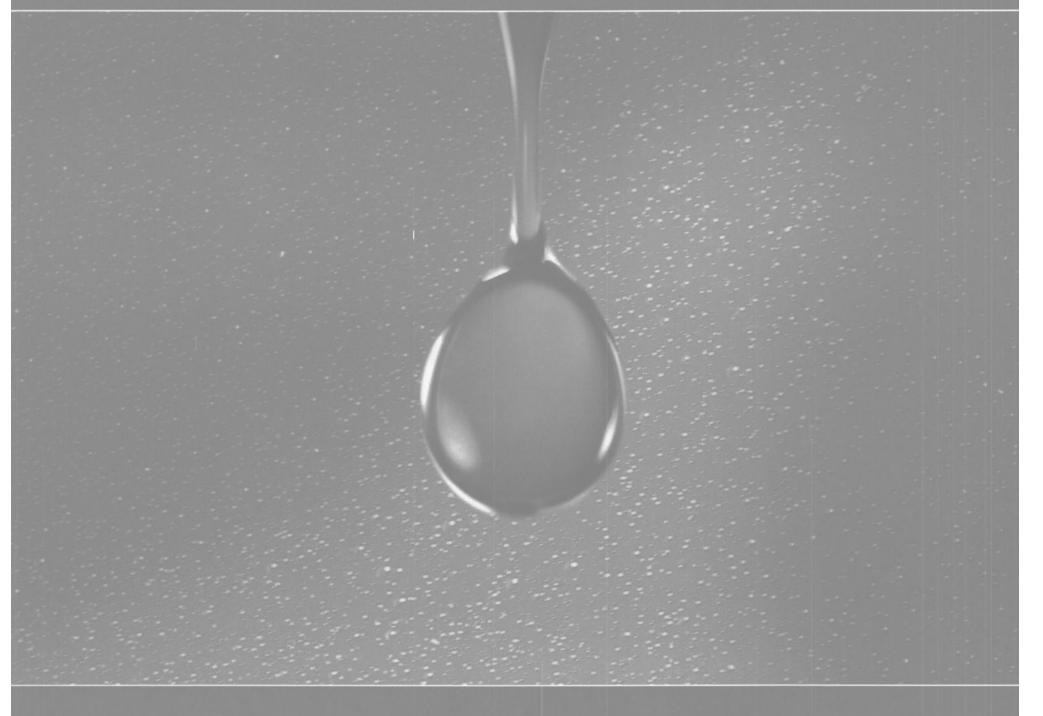
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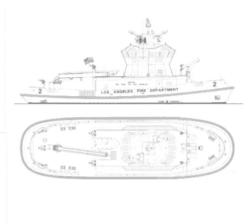
Nichols Bros. To Construct Powerful Fireboat

Nichols Brothers Boat Builders of Freeland, Wash. has signed a contract with the Port of Los Angeles for the construction of what will reportedly be one of most powerful fireboats in the world.

The new fireboat, which was designed by Robert Allan of Vancouver, B.C. will have propulsion and steering control provided by twin cycloidal propellers, Model 26 GII/165 provided by Voith Schiffstechnik GmbH & Co. each driven by a Detroit Diesel Model 12V 4,000 diesel engine, rated at 1,343 kW at 1,800

rpm. The vessel's fire-fighting system will be the same as any fireboat currently in service, with a total of 31,000 gpm delivered from a total of six pumps provided by Unitor Fi-Fi Systems.

Other notable features of the fireboat include an extending ladder, man lift for high level access and rescue operations;





extensive survivor treatment facilities; and an innovative hull form, which has been tested and developed by Robert Allan to generate low wash in the restricted waters of the Port of Los Angeles.

The vessel's construction is expected to take 12-14 months. Upon completion, the fireboat will sail south to assume its responsibilities in the Port of Los Angeles, replacing the 75-year-old Ralph J. Scott, which will then be formally retired from active service.

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Main Particulars - High Performance Fireboat
Length, (o.a.)
Length, (dwl)
Beam, (molded)
Depth, (molded)
Maximum draft
Air draft
Max. speed
Pumping capacity
Fuel oil
Fresh water500 gallons
Fi-Fi foam
Main engines
Propulsion units Voith-Schiffstechnik
Main engine pumps 2 x 6,500 gpm
Pump engine
Pump engine pumps .2 x 5,500 gpm; 2 x 3,500 gpm
Fire-Fighting Monitors:
Foredeck
Tower
Aft deck
Under wharf monitors
Hose Outlets:
Fore deck 6 x 4-in. foam/water
Aft deck \dots 10 x 4-in. water; 4 x 2.5-in. water
Foam system:
Pumps 2 x 165 gpm; 2 x 60 gpm
Crane/Man Lift:
Boom
Slewing/luffing 360 degrees, 0 to 75 degrees
Hoisting \dots 1,000 lbs. at 30-ft. horizontal radius
Platform/basket
Accessories 4 x 500 watt floodlights
Operating crew
Firefighters

Environmental Focus

Statoil Ships Run on Gas ... Liquefied Natural Gas That Is

Norway's Statoil has called upon shipbuilder Kleven Verft to construct a pair of 309-ft. (94.3-m) supply ships that will run on LNG. The vessels, which are scheduled for completion during 2003, and operated by Statoil, will be contracted from Eidesvik and Møkster Shipping. According to Knut Barland, Statoil's vice president for Environment, the LNG power concept is expected to cut the vessels' nitrogen oxide (NOx) emissions by 85 percent; annual emissions are expected to be lowered by 420 tons.

By Regina P. Ciardiello, senior editor

Why would a company knowingly add \$6 million to the construction price of a new vessel, and more than \$1 million per year in operating costs? The answer is a multi-faceted one, but basically it comes down to environmental responsibility. Known as the first operator on the Norwegian continental shelf to feature LNG powered propulsion on its vessels, Statoil said that a driving force behind its decision to go with LNG power was two-fold — the company wanted to employ a pair of vessels that would be environmentally sensitive — while building upon new technology. While the vessels are more expensive to build and operate, they also tremendously reduce emissions, a savings that can be distributed into the company's overall operations. According to Barland, the Norwegian government has allowed Statoil to credit the NOx reduction against land-based entities. "Reductions achieved in one place, can be used in other places," Barland said. He's referring to myriad of projects that Statoil is currently involved in, which includes two 400 MW gas-fired stations located in Kaarstoe and Kollsnes. The plants, which are part of a deal that involves Statoil, Norsk Hydro and Statkraft, are an issue with the Norwegian Government, according to Barland, because of their carbon dioxide CO2 emissions. Per the government, refineries must hold NOx emissions down to five parts per million (ppm), which according to Barland, is an expensive task. The reasoning behind this, he adds, is to curb the acid rain problem that is prevalent on the Norwegian continental shelf.

So instead of taking the conventional route, Statoil approached the Norwegian

Government with its idea for the LNGpowered vessels, and upon its approval, the innovation/creative process was begun. The task of bringing the innovative vessels to fruition has involved not only Statoil, but Eidesvik, who is chartering the vessels, as well as Kleven Verft, the Norwegian shipyard that has been designated as the builder.

So far, according to Eidesvik's administration director, Nils Himle, the production process is one of trial and error. "One of the challenges of this project is making the rules as you go along," Himle said. "Since this (the construction of LNG-powered ships) has never been done before, there are no guidelines that have already been established." Himle added that the company, along with both the Norwegian Government and Det Norske Veritas, is working to formulate a set of guidelines in hopes that this project is a blueprint for future LNG-powered vessel projects.

The 4,400-gt vessels will have an overall length of 311 ft. (94.9 m), a breadth of 67 ft. (20.4 m) and design draft of 25 ft. (7.5 m), and will operate at a service speed of 16 knots. According to Himle, they will be larger than most supply vessels as more capacity than usual will be taken up by the LNG tanks, which when backed up by diesel fuel, will hold 1,000 cu. m. Water ballast capacity is 2,000 cu. m. and deck cargo capacity checks in at 2,500 tons.

Upon their scheduled 2003 completion, the vessels, which will operate from the Coast Center Base near Bergen, will supply oil and gas installations in the Tampen area of the North

Main Particulars
FlagNorway
ClassDNV
Vessel Name (s) Yard No. 301 and 303
Owner/operator
Contract date June 2001
Length, (o.a.)
Length, (b.p.)
Breadth, (molded)
GTApproximately 4,400
DWTApproximately 6,300
Draft, (design)
Draft, (scantling)
Speed, service
Complement
Deck cargo capacity Approximately 2,300 tons
Bunker
Water ballast



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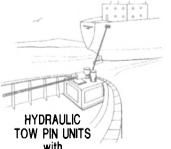
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Environmental Focus

WQIS Broadens Coverage To Meet State Requirements

The U.S. has been widely known to have the most stringent marine pollution liability laws of any country. But now the states are making the laws even

tougher for the marine community. WQIS, the Water Quality Insurance Syndicate, announces two new insurance endorsements to protect the marine community from increased state legisla-

WQIS provides a new option to cover

state spill requirements even when they are broader in scope than the Federal Oil Pollution Act of 1990 (OPA 90). In the past, when a federal officer signs off on effective cleanup of a spill and a state official demands further cleanup, the assured has been unprotected for addi-

tional cleanup costs. WQIS' broader in scope coverage removes the gap that exists between new state requirements and federal legislation.

WQIS also provides a new option to cover state civil fines and penalties. In recent years, states across the country have become more active in writing laws dealing with pollution. As part of this development, they have been imposing a growing number of civil fines and penalties. Additionally, these civil fines and penalties have been for higher dollar amounts. The states of Texas and New York are among the more active in assessing fines. For example, on consecutive days, Texas recently assessed a spill penalty of \$10,000 for a 3,000 gal. fuel spill from a dredge and \$5,000 to a seafood operation for a discharge into Texas waters during a fuel transfer. Legislation is on the books in states like California and Maryland to assess penalties of \$30 to \$100 per gallon spilled, which can create assessment fines of millions of dollars. To assist brokers and assureds in understanding the requirements of each state in which a vessel operates, WQIS launched a new website. www.wqis.com, with a powerful, interactive State Law Directory. Brokers and assureds can select a state and learn immediately if state requirements are broader in scope than federal requirements and find what remedies are avail-

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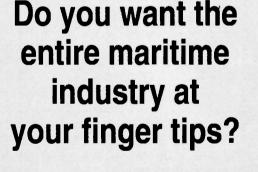
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Ensolve Biosystems Wins U.S. Navy Contract

EnSolve Biosystems has been awarded a Small Business Innovative Research (SBIR) grant from the U.S. Naval Sea Systems Command to develop a fully automated biomechanical system for removal of oily wastes from ships' bilge water so it can be safely discharged overboard. The new biomechanical technology would replace the existing mechanical oily water separators currently used by the Navy.

According to Dr. Jason Caplan, president and CEO of EnSolve Biosystems, the research program for the U.S. Navy will be based on technology originally developed by the company for the commercial marine market.

Last year, EnSolve Biosystems introduced the PetroLiminator system, which uses safe, non-pathogenic bacteria to remove oil, grease, detergents and other hydrocarbons from bilge water so it meets strict international standards for overboard discharge.

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Maritime Reporter & Engineering News

Environmental Focus

Shipping Industry Cracks Recycling Code

An inter-industry working party

comprising the International Chamber of Shipping (ICS),BIMCO, Intercargo, Intertanko, ITOPF, ITF and

OCIMF — has launched an Industry Code of Practice on Ship Recycling, outlining measures, which shipowners should be prepared to take before getting rid of redundant ships. In addition, to examining the steps that shipowners might take prior to the delivery of ships at recycling yards, such as the cleaning and certification of tanks to hot work and entry standards, the Code includes an Inventory of Potentially Hazardous Materials on Board, intended for the completion on a ship's last voyage prior to being broken up. Copies of the invencan be downloaded www.marisec.org/recycling.

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Wärtsilä Wins **Environmental Award**

Det Norske Veritas granted Wärtsilä's Finnish companies, Wärtsilä Finland Oy and Wärtsilä Technology Oy, ISO 14001 environmental certification in recognition of the functionality of Wartsila's environmental management system. Wārtsilā's ISO 14001 environmental management system covers all the company's operations: sales, manufacturing, R&D and service.

ISO 14001 is an international environmental standard. Wärtsilä's engines meet all current environmental requirements and Wärtsilä's goal is to exploit new technologies to achieve further reductions in emission levels. At the international level environmental impacts are regulated on the marine side by the International Maritime Organization (IMO) and, in the power plant market, by the World Bank.

The ISO 14001 environmental certificate is the result of systematic work by Wärtsilä's Finnish units in pursuit of better environmental performance. This work involved the participation of all employees. The units also have specific environmental teams that have supported and guided the environmental development work undertaken by the units. The teams have additionally created a system for steering and monitoring environmental matters and for maintaining the pace of improvement.

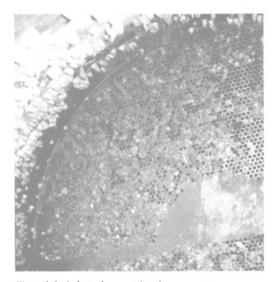
Successful Test Of Oil Spill Prevention System

Based in San Diego, Calif., MH Systems' president Mo Husain has spent the last 10 years leading a team of engineers and scientists in the development

of an advanced spill avoidance system. Known as the American Underpressure System, the process virtually eliminates oil spills on tankers involved in accidents. Funded by the Office of Naval Research, the test and validation was conducted before an assembly of government, shipping, oil and environmenexecutives, onboard Shoshone, a reserve fleet tanker at the Port of Richmond, Calif.

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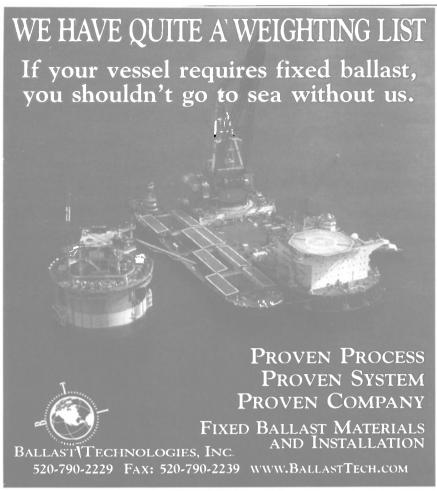
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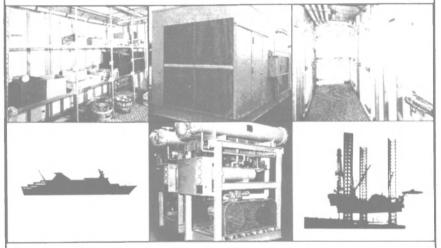


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Pumping Ballast for Ocean-Going Barges

In Seattle, Wash., two of the largest barge companies in the world use Bibo pumps from ITT's Flygt unit and axial flow pumps from ITT's Goulds Pump unit to pump ballast water for trim and balance of oceangoing barges as they load and unload their cargo of commodities.

One of the regions of the world with a large concentration of tugs and barges is the Pacific Northwest of the U.S., particularly around the City of Seattle.

Headquartered in Seattle, Foss Maritime operates the largest tug fleet on the west coast and provides a full range of marine transportation services. The cargo for Foss' barges is diverse and includes weekly scheduled tows transport agricultural products such as peas, beans, lentils, flour, hay cubes, alfalfa products, as well as milk carton stock and dimensional lumber, from the ports of Lewiston, Umatilla, and Portland, for export overseas. Refrigerated containers laden with french fries and other perishable commodities are shipped in special barges outfitted with generators.

A 286-ft. (87.1-m) ocean-going cargo barge was recently transferred from Foss Maritime to a sister company, Hawaiian Tug and Barge. Designed to transport cargo in 20 x 8 x 8-ft. (6 x 2.4 x 2.4-m) containers that are stacked on the deck of this huge barge, the barge underwent a large-scale modification at the Foss shipyard in Seattle for work in the Hawaiian islands. One of the most important modifications was the addition of a new pump scheme to simplify the ballasting system aboard the barge.

As the barge is loaded and unloaded with the massive containers that are often driven on and off the barge, the barge must stay even with the dock. When loading the containers, this means adjusting the ballast by pumping sea water out of the ballast tanks to increase the buoyancy of the barge — with the reverse being the case as cargo is offloaded; a procedure requires great communication between the barge operator and the longshoremen.

The existing labor-intensive, antiquated ballast systems on most barges usually use big, inefficient pumps, thousands of feet of expensive alloy piping, manual labor to turn valves, and lots of room for

As part of the modification of the barge, Foss Maritime requested that a Goulds Pump distributor, Beckwith & Kuffel help them re-evaluate the way operators ballast/de-ballast the barge.

According to Mark Romero of Beckwith & Kuffel, "The barge in question required four ballast systems. The goal when ballasting/de-ballasting is to trim and balance the barge as it is loaded and unloaded with ocean containers." Romero continued, noting that, "The advantage of



The Pacific Northwest boasts one of the largest concentrations of tugs and barges.

the axial flow pump is that it can run in both directions — for ballast and deballast. This unique feature and benefit allowed us to solve their problem."

Romero contacted Charlie Burrows of Goulds Pumps Ashland Operations, for assistance. Together, Romero and Burrows concluded that a Goulds axial flow pump, which can run in alternating rotation, could provide a simplified solution to a complex operation. Running the pump in standard rotation would add ballast. Reversing rotation would send water out the sea chest.

This solution resulted in the installation of four Alloy 20 MPAF pumps, including motors, control panels, and variable frequency drives. The reverse-rotation approach has greatly simplified adjusting the barge ballast. The Goulds solution has also reduced the alloy piping requirements and minimized the number of expensive valves that are required, and made changing the barge ballast simpler and faster. Now a simple push of a button will change ballast in minutes instead of hours.

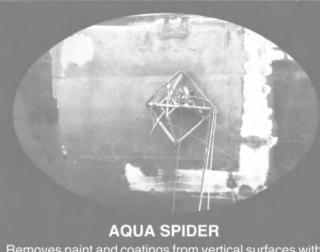
Foss Maritime has found this innovative system greatly beneficial, as it reduces the company's total cost of ownership — initial price, energy consumption, maintenance and operation costs are all dramatically reduced.

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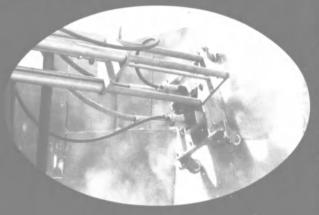
Web Site Boasts Directory Of Oil Spill Cleanup Organizations

Containing more than 1,100 oil spill response centers in 49 countries and the entire U.S., Cleanupoil.com continues to grow at a rapid pace. Known as the most comprehensive International Directory of Oil Spill Cleanup Contractors and Response Organizations (OSRO's), Pollution Cleanup Contractors and closely related service companies, the site provides a useful tool to contractors, planners, insurers and just about anyone who benefits from an oil spill responder.

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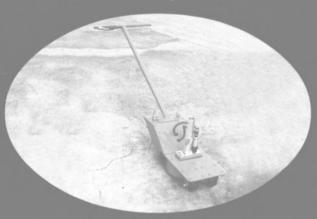
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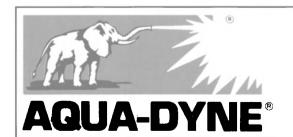
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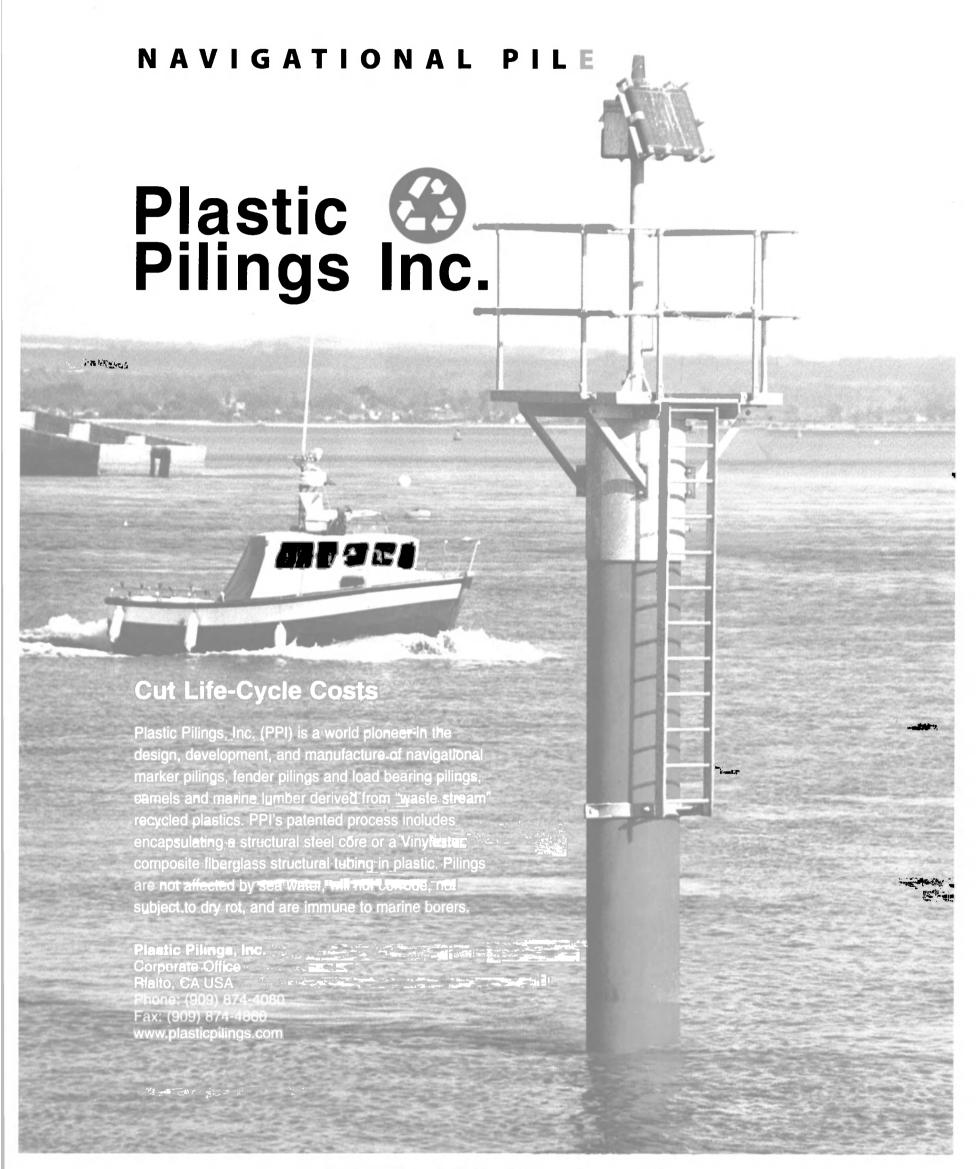
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ABB, Samsung Develop New Propulsion Concept

Playing off of each other's strengths, ABB and Samsung announced a jointly developed propulsion concept for the new 12,000 TEU containerships developed by Samsung. Instead of being outfitted with a rudder, the ships will feature a CRP Azipod unit mounted directly behind the standard propeller. Located on the same axis, but without any physical connection, the pod's pulling propeller will contra-rotate in relation to the shaft-driven main propeller. The arrangement will provide an estimated improvement of more than 10 percent in hydrodynamic propulsion efficiency.

Wärtsilä Powers The New Bay-Class Landing Ships

Wartsila Corporation has received the contract to supply the diesel generating sets for two new Bay-class Alternative Landing Ships Logistic (ALSL) building for the U.K. RFA. The four main diesel-generating sets in each ship will be powered by Wartsila 26 diesel engines: each ship having two Wartsila 8L26 and two Wartsila 12V26 engines.

Wartsila will also deliver an emergency diesel generating set to each ship. Additional ship sets for a further two vessels to be built at BAE Systems Govan yard will also be supplied subject to pending optional contract. The first two ships, newbuilding numbers 141 and 142, are to be built at Swan Hunter (Tyneside) Ltd in the U.K.

The twin-screw vessels will have diesel-electric propulsion. With an overall length of 579 ft. (176.6m) and displacement of 16,160 tons, they will provide tactical sea-lift as part of an amphibious group, and also be used for routine military transport and logistic support. They will carry troops and their vehicles, including main battle tanks and landing craft.

Halter Marine Subcontracts Noise Control Engineering

Noise Control Engineering (NCE) has been granted a subcontract from Friede Goldman Halter for the engineering and acoustical design services on NOAA's new Fisheries Research Vessel, FRV-40. The ship, which will be designed to quietly perform fish stock assessment studies in the open ocean, will reportedly be one of the most sophisticated and quietest vessels of its type. NCE will be a key player in the detail design of the vessel along with Halter Marine's Engineering Office in Gulfport, Miss.

The firm, which is preparing a variety of acoustic design studies and analysis, will be responsible for noise control treatment recommendations and their design.

The company will also perform construction inspections and eventually test the vessel to assess if it complies with the requirements for underwater sound.

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Hebridean Spirit Is First Ever Cruise Vessel To Call Ystad

On August 18, Ystad had its first ever cruise call following its plan to become Southern Sweden's cruise destination for the region of Skane — known as the gateway to Swedish culture rich with Danish history.

Hebridean Spirit, and its Captain Mark Dexter, were

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ANCHORS CHAINS

c o m e d by two military orchestras and more than 2,000 spectators pierside, as well as **Hakan Mattsson**, the mayor of Ystad.

wel-

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Schlumberger, Yukos To Create Field Development Planning Center in Moscow

Schlumberger Oilfield Services and Yukos have agreed on a three-year contract to create a field development planning center in Moscow. Representative reservoir models created at the center will provide the basis for determining the most economical design for field development lowest operating cost and capital expenditure for highest recovery and production rate. Yukos will use the field development plans to produce drilling and workover programs, surface facility designs, environmental impact evaluations, economic evaluations, and secondary recovery plans.

The new Yukos center will serve as a key technology hub for the accelerated development of production and provide a training ground for Yukos engineering staff. Equipped with the latest in technology and software, the center will enable virtual real-time access to Yukos fields for high-speed decision-making.

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Anteon Receives Information Security Contract

Anteon has been awarded a four-year (base plus three option years), \$4.7 million contract to support the Military Sealift Command's (MSC) Department of Defense Information Technology Security Certification and Accreditation Process (DITSCAP). The DITSCAP was developed to standardize the process of certifying and accrediting all DoD Automated Information Systems. Under this contract, Anteon and Corbett Technologies, a small business specializing in information assurance and the DITSCAP, will assist the MSC in certifying and accrediting its critical information technology assets.

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U.S. Military's High Speed Crew Experience MES

The U.S. Military's hand picked crew for the 315-ft. (96-m) Wave Piercing Sealift Catamaran, Incat hull number 050, were recently able to experience, first-hand, the speed and exhilaration of the vessel's Marine Evacuation System (MES).

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(17-m) inflatable slides.

The vessel, which has since been named Joint Venture, is designated HSV XI (High Speed Vessel Experimental One). It will be utilized by TACOM, the Tank-Automotive and Armament Command of the U.S. Army for its ability to perform specific mission scenarios and limited operational experiments in order to assess its usefulness in U.S. Military and Coast Guard applications, which require a platform to move troops, heavy military vehicles and equipment.

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People & Company News

Wynn Offers New Wipers

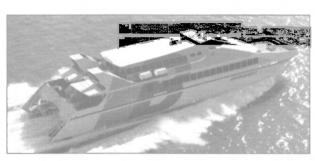
Wynn Marine has developed a new Pantograph wiper system, featuring an externally mounted motor position, which is easier to fit than its predecessor. The Wynn 1801 SeaHorse complete unit is fitted externally, which reduces

the need for bulkhead penetrations. This feature allows the system to be more flexible, while avoiding conflict with other equipment fitted above or below the bridge windows. The 1801 is suitable for newbuilds and refits. The Pantograph arc of the Seahorse wiper is

adjustable from 35 to 90 degrees, with blade lengths ranging from 300 to 800 mm; arm lengths range from 300 to 850 mm, allowing the system to meet most applications.

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Jeffboat Names Herre As President & COO

Robert P. Herre has been appointed as president and COO of Jeffboat LLC, a subsidiary of American Commercial Lines. Herre, who assumed his new

position on September 1, 2001, succeeds Robert W. Greene III, who plans to retire. Herre joined ACL 10 years ago as manager of Jeffboat's Engineering Department.



Since then, he has served in a variety of positions for the company, most recently as vice president of Vessel Management for ACL.

MTU Expands Activities In France

This past July, MTU launched the official opening of its new subsidiary MTU France in Cannes. The new company will assume all activities for DaimlerChrysler Off-Highway propulsion systems in France, with a focus on the MTU, Detroit Diesel and Mercedes-Benz diesel engine brands. The activities of the newly established French subsidiary include sales and marketing, service, technical information and spare parts service. Christian Courcelles will serve as head of MTU France; the company will maintain its corporate management offices, sales operations and one service center at the Paris headquarters, while another service center will be located in Cannes on the Mediterranean

Founded in April 2001, MTU France, which is undergirded by its two service centers and Penven as its distributor, exudes a powerful infrastructure. The company currently services more than 1,000 engines, including various engines in ships and yachts along the Mediterranean.

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Hamilton Jets For Portuguese River Catamarans

Image Marine of Western Australia, a member of the Austal Group, has ordered Hamilton Waterjets for two River Catamarans to operate in Portugal. Each of the two 121 ft. (37-m) catamarans will be fitted with twin Hamilton Model HM651 waterjets, which will be controlled using Hamilton's MECS electronic control system, to give an operational speed of 29 knots.

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Self-Cleaning Filter System Cuts Maintenance Costs

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PROP

tight quarters of the engine room the narrow galley stairs for disposal and onboard a boat is normally a messy and | new oil and filters must be carried down

boat is in dock for maintenance.

Boston Harbor Cruises found that Alfa Laval's Eliminator, an automatic selfcleaning filter system installed in com-

SOLUTIONS



Boston Harbor Cruise Line's ferry -



Robert Tarrant, engineering manager of Boston Harbor Cruise Lines, inspects the Eliminator Filter on the engine of one of the company's filters.

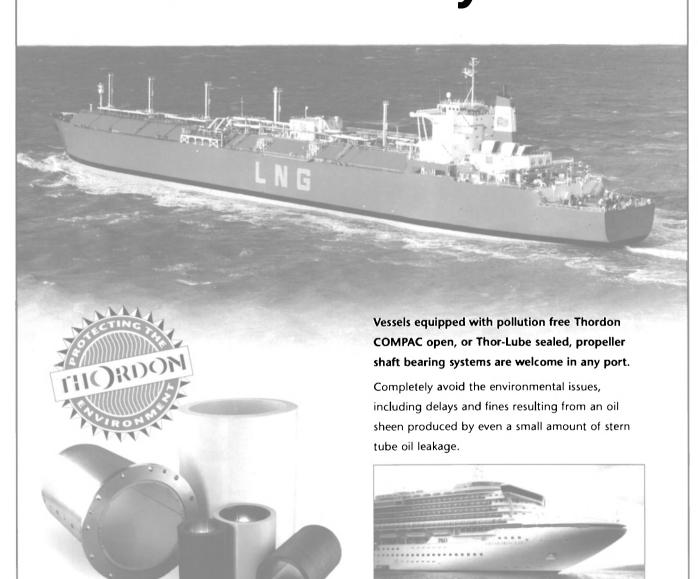
bination with Cummins' Centinel system in its high-speed catamarans, saved \$2,100 per engine per year in oil, filter and labor costs.

With a total of three boats, each with four engines, equipped with the Eliminator, Boston Harbor Cruises save a total of \$25,200 per year. "After three years in operation, we are still seeing perfect oil analysis so extended engine life is an additional payoff," says Robert Tarrant, engineering manager for the Boston Harbor Cruise Lines.

The Eliminator consists of an Alfa Laval Moatti automatic, self-cleaning filter and an Alfa Laval disc-stack centrifuge in a single, compact integrated housing. These two sections comprise a complete engine-mounted oil cleaning system. The full-flow section utilizes a series of stainless steel mesh elements to filter the oil and protect the engine. A small portion of the filtered oil is used to backflush sections of these elements to prevent dirt from accumulating on the screen. The backflushed oil containing the impurities is then fed to the separator section of the Eliminator, which is a very efficient disc-stacked centrifuge that cleans oil down to a two-micron level. All dirt removed in the full-flow

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section eventually is deposited in the centrifuge sludge where it is easily removed. The only maintenance required is replacement of the sludge collection paper in the separator.

Service Intervals Increased From 250 to 1,000 hours

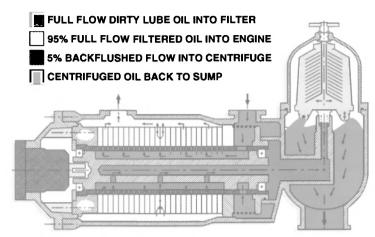
The majority of the savings are the result of reduced maintenance hours as a result of extended intervals between service. On average, each boat with four engines requires 12 oil changes per year, totaling 144 man hours. In contrast, service on the Eliminator and the Centinel engine is required at 1,000-hour intervals and takes only two to three hours per engine for separator maintenance and oil top-off.

Oil drainage intervals have been extended from 250 to 4,000 hours and, in some cases, indefinitely with good oil analysis results. "So far the oil is still golden brown instead of black; we've seen no soot at all in the oil and iron deposits were less than 13 ppm.

Cummin's Centinel system blends used oil with the fuel to be combusted in the power cylinders, which allows the oil to be converted to useful energy in the diesel engines.

Anything less than 100 ppm is not bad. We have not noticed any oil consumption either," says Tarrant. "As a bonus, we expect to see 18,000 to 20,000 hours of service before the engines need a major overhaul. The normal interval between overhauls for engines not equipped with the Eliminator has been 9,000 to 12,000 hours of service."

"There are other intangible benefits with the Eliminator filter system," says Tarrant. "Changing oil is not a fun job; you can put a price on downtime but not on aggravation and headaches. With the Eliminator, we avoid the environmental issues involved with disposing of oil and filters and safety issues with employees handling and carrying wastes up the galley stairs. Each engine needs 35 gallons of oil and that means 35 gallons of dirty oil that has to go up the stairs and 35 gallons of new oil that has to be carried down the stairs. The only waste product



with the Eliminator is one piece of paper and that is the filter. This frees up our maintenance crew to perform other duties on the boat."

Alfa Laval developed the Eliminator in the mid 1990s in cooperation with Cum-

mins Inc. in response to the need for reduced maintenance and fewer spare parts in marine applications.

The Eliminator is installed on the engines on three of the Boston Harbor Cruises' boats, Nora Vittoria, Millenni-

um and Aurora. The three identical passenger ferries, which measure 121 ft. (36.8 m), have a capacity of 400 passengers, and can operate as high-speed commuter ferries and excursion boats for whale watches in the Boston Harbor. They are owned and operated by Boston Harbor Cruises, which is one of the largest passenger boat companies in the country. Founded in 1926, the company has 175 year-round employees and 300 seasonal employees and owns and operates 25 vessels on the Boston Harbor and Narraganset Bay, carrying more than 1.9 million passengers annually.

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The preceding was authored by by **Greg Schmelz**, key account manager, Diesel OEM, Alfa Laval Inc., Greenwood, Ind.





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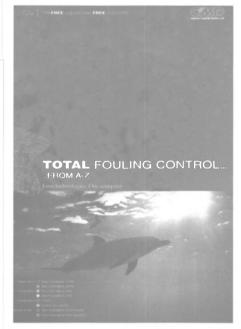
Coatings and Corrosion Control

CMP Packs Decade of Tin-Free Experience

The International Maritime Authority has proposed a worldwide ban on tributyl tin (TBT) based antifouling paints,

starting in January 2003. Confirmation of these dates is expected at the IMO diplomatic conference this October.

Although some ship operators have already converted to tin-free antifoulings, most ship operators are waiting



until the ban is confirmed before they decide a policy on the use of tin-free antifoulings. This is due to cost and performance considerations. It is clear that most ship operators are not informed about the available tin-free technologies and are not aware that there are products, which are equal in performance to TBT-based antifoulings.

Considerable experience with tin-free antifoulings is found in Japan, as the Japanese were first to ban the application of TBT antifoulings in 1992. Thus, much development work on alternatives has come from Japanese based marine paint companies, such as Chugoku Marine Paints, Ltd. Chugoku Marine Paints has experience in new generation tin-free antifoulings, mainly due to its 50 percent market share in its home country of Japan. CMP has now coated more than 8,000 vessels with their tin-free technology.

There are four mainstream tin-free technologies available and Chugoku Marine Paints are unique in providing all four technologies. This allows unbiased advice to be given to ship operators. Dry-docking specifications can be made up of a combination of the technologies below to produce the ideal price/performance combination.

Third Generation Tin-Free Antifoulings — Sea Grandprix 1000 (Sea Grandprix 2000 for coastal ships):

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- Self-polishing and self-smoothing to minimize fuel consumption
- Chemically very similar to TBT-based antifoulings

Typical uses are on trades with a high fouling risk such as LNG and VLCCs trading in the Persian Gulf, cruise ships, short sea and coastal vessels operating in the Mediterranean and Caribbean.

Second Generation Tin-Free Antifouling - Sea Grandprix 500 (Sea Grandprix 700 for coastal ships)

Based on Metallic Acrylate resin, this technology offers good performance to most deep sea and coastal vessels. Benefits include:

- Equivalent performance to medium strength TBT based antifouling
- Three- to five-years between dry-dockings, dependent on trade
- Large, successful track record of more than 2,000 full ship applications
- Self-polishing and self-smoothing to minimize fuel consumption
- Can be applied direct to all other antifoulings
- Chemically similar to TBT-based antifoulings

Typical uses are on bulk and tanker trades, ferries, RoRos and car carriers.

First Generation Tin-Free Antifouling - TFA10 and Seatender Series

This original self-polishing, tin-free technology is widely used and devel-

oped during the 1980's. Also called ablative, eroding or controlled depletion, the polishing mechanism in seawater is not as controlled as for second and third generation antifoulings. Benefits include:

- Relatively low cost
- Large track record at new building and repair more than 5,000 full ship applications
- Up to three years between dry-dockings
- High volume solids to reduce solvent emissions
- Can be applied direct to all existing antifoulings
- Typical uses are on bulk trades, ferries, RoRos and car carriers.

Biocide-Free Systems

Sea Grandprix Eco-Speed products are proven copper and biocide-free systems. A non-toxic (biocide-free), fouling control system is important to certain high profile industries, such as navy's and environmental agencies. Containership and cruise ship operators are also interested in this technology due to potential fuel savings during five-year dry-docking cycles.

The coating employs special silicone rubber coatings present such a slippery, non-stick surface that fouling does not adhere well to the surface. Any fouling is easy to remove and normally these systems are self-cleaning. When water passes over the surface, the fouling is literally pushed off. So they are not antifoulings, they are foul release sys-

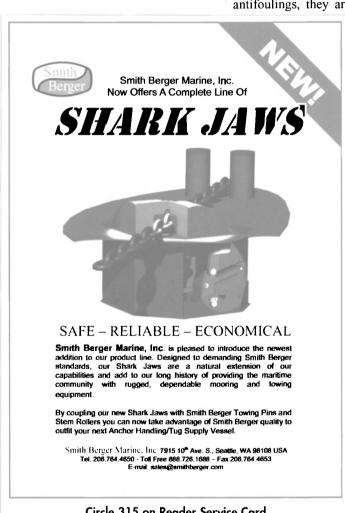
tems. Two versions are available for use on ships:

First Generation for deep sea and fast coastal vessels — Sea Grandprix Eco-Speed; and second Generation for slow coastal and low activity vessels — Sea Grandprix Eco-Speed C

Benefits include:

- Biocide-free and environmentally friendly
- Up to five-years between dry-dockings
- Slippery and ultra-smooth surface for reduced drag and fuel consumption
- Low slime build up and self-cleaning from 10 knots

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Coatings and Corrosion Control

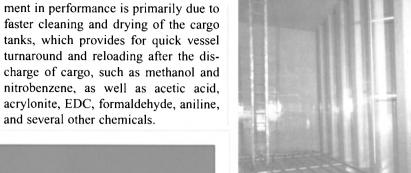
MarineLine Boosts Clearwater's Profitability

Before Holland-based Clearwater Group's newbuild MT Coralwater, a 5,300-dwt chemical tanker, entered service in July of 1998, the vessel's cargo tanks were coated with MarineLine, the

Siloxirane polymer-based anti-corrosion system developed and manufactured by Advanced Polymer Sciences, Inc. As a result, the number of revenue-earning voyages completed by the vessel is more than 40 percent greater than that of vessels treated with other coatings systems.

The Coralwater's substantial improve-

ment in performance is primarily due to faster cleaning and drying of the cargo tanks, which provides for quick vessel turnaround and reloading after the discharge of cargo, such as methanol and nitrobenzene, as well as acetic acid, acrylonite, EDC, formaldehyde, aniline,



MarineLine is designed to be impermeable, with negligible absorption of cargo into the coating. The product also offers a smooth surface, which contributes to shorter tank washing and drying times.

"This means Coralwater is able to undertake 63 more sailing days per year" than vessels treated with other coatings, said Don Keehan, CEO and director of research at Advanced Polymer Coatings. "On the basis of a projected profit of 43,500 per day, multiplied by the extra 63 days of revenuegenerating service, this means \$220,500 additional profit per year," he added.

The new series of Clearwater Group chemical tankers each have 10 cargo tanks and two slop tanks, representing a coating surface of 3,850 sq. m. Keehan noted that when this figure is related to the additional profit per year, Marine-Line generates an extra \$57.27 a year, and emphasized that on larger ships, the profit earned is greater still.

As a result of Clearwater's positive experience with Coralwater, the company specified MarineLine as the tank coating to be used for two newbuilds delivered this year.

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Coflexip Stena Offshore Chooses Cathelco

The installation earlier this year of pipework antifouling systems on three Coflexip Stena Offshore vessels means that almost the entire fleet is now protected by Cathelco equipment.

The latest ship to be fitted with a Cathelco system was the CSO Constructor, which underwent a major conversion at Cammell Laird Tyneside for deepwater offshore operations. As a diving support and subsea construction vessel, it is capable of working throughout the world in various weather conditions in any sea.

Cathelco supplied pipework anti-fouling and corrosion suppression systems to protect the vessel's forward and aft engine seawater cooling services and



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ancillary services.

The forward system is designed to provide protection for flow rates of up to 1,660 cu. m. per hour by utilizing two pairs of copper and aluminum anodes fitted in the seachests and fed with an electrical current from a Cathelco modular panel.

The installation on CSO Constructor followed a similar project performed on the purpose-built diving support vessel CSO Alliance in October 2000.

Other Coflexip ships fitted with Cathelco systems include CSO Orelia, CSO Apache, CSO Seawell, and CSO Marianos, CSO Wellservicer.

The Cathelco system has been installed on more than 6,000 ships around the world. It is based on the electrolytic principle and is designed to suppress corrosion inside pipes and safeguard vessels against the growth of barnacles and mussels that settle in the pipework and cause difficultto-remove blockages.

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Krautkramer's DMS 2 Features TopCOAT

Krautkramer's DMS 2 portable ultrason-

thickness offers gauge TopCOAT, patented feature that simultaneously measures and displays the remaining wall thickness of pipes and other equipment



well as the thickness and velocity of the coating used to protect them. It features a large, high-resolution LCD screen where measurements are displayed. The instrument is designed to save users time and money by eliminating the need to remove and reapply the coating in order to take

measurements. TopCOAT is also designed to provide increased sensitivity to heavy internal corrosion and pitting.

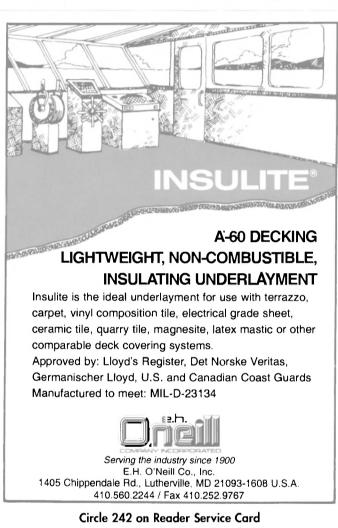
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Dewcheck Series Measures Climatic Parameters

Thermiport Quality Control's Dewcheck series 2 is a newly developed gauge for measuring climatic parameters that are relevant during coating jobs. The product measures or calculates air temperature, relative humidity, dewpoint and surface temperature, as well as the difference between dewpoint and surface temperature, and alarms the user when climatic conditions are unsafe for painting.

The Dewcheck's ergonomic, rugged design is intended to withstand the harsh environment of the protective coatings industry. It also features an illuminated display and keyboard for use in poor light.

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Coatings and Corrosion Control

Trelawny Offers Needle Scalers For Coatings Removal

Trelawny's wide range of pneumatic needle scalers are designed for corrosion and coatings removal on irregular and hard-to-reach areas such as rivet heads. weld seams and corners. A wide range of types and sizes allows selection of the best tool to meet specific application requirements. Hand-held models are available in various sizes with 12 to 42 needles. Adjustable front tubes concentrate needle coverage for better performance and reduce needle bending. Needles are heat-treated and are also available in stainless steel and spark-resistant beryllium copper. Chisel-tip needles are standard, and flat-tip and pointed-tip alloy steel needles are also available.

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3M Deburring Wheels Perform On A Variety of Metals

3M XK Wheels are designed to provide a consistent cut and improved edge



retention while generating minimal dust. The wheel features a molded construction that stabilizes the abrasive grain throughout the wheel to create a faster, more aggressive cut ideal for heavy-duty or large-part deburring and cleaning. In addition to deburring, the wheel can also be used for parting line removal, scale removal, and refining machine marks. The XK Wheel is designed to perform on a variety of metals, including stainless steel, titanium, carbon steel, brass and bronze. XK Wheels are currently available in 6-in., 8-in., 10-in., and 12-in. diameters in fine and medium grades, and the line is expected to expand in the future.

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Sherwin-Williams Coatings Provide Waterborne Solutions

Waterborne coatings from Sherwin-Williams, such as Dura-Pox WB epoxy coatings and Centurion water-based urethane, are designed to offer high-quality



performance even when environmental regulations or application consideration affect coatings choices. Dura-Pox WB Epoxy finish and Dura-Pox Epoxy Primer are designed to provide an impact-resistant epoxy cycloaliphatic amine finish that holds up well to weather, chemicals and abrasion. It is fast-drying and forms a high-gloss finish. All three coatings are VOC-compliant, clean up easily in water, have a low odor, and are non-flammable.

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SJD-1206 IRCS Workstation

With this one workstation it is possible to operate a multitude of radio communication facilities. A user-friendly design ensures easy operation by all operators.

JMA-9800 Color ARPA Radar

This futuristically designed radar unit features a large 29-inch high-definition color CRT display. It enables quick detection of small targets.

JAN-3598 ECDIS Total Navigator

This advanced ECDIS system permits fully automatic navigation. It features a large color LCD and abundant functions unique to JRC, including radar video overlay, grounding prevention, NAVTEX data, route safety check, alarm displays and engine data display. The result is greater safety and economy.

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Surface Preparation Guide Describes Methods, Standards



Surface Preparation Guide, a new brochure from Sherwin-Williams Industrial and Marine Coatings Group, describes proper surface preparation methods for various substrates and SSPC standards.

The six-page brochure describes the steps needed to achieve proper surface preparation considering the substrate, the environment, the coating selected and the expected ser-

vice life of the coatings system. Surface cleaning and mechanical and chemical surface preparation methods are described. All substrate types are covered, including concrete and masonry, previously coated surfaces, and non-ferrous and ferrous metal surfaces.

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Dampney Manufactures Advanced Coatings

For more than 80 years Dampney Company, Inc. has manufactured technically advanced, corrosion resistant protective coatings. Complete testing facilities are available to help solve coating and corrosion problems and to evaluate existing and new protective coatings, systems and raw materials. The company's line includes Apexior Number 3, a single component air cure coating for immersion in fresh and salt water. Designed as easy to apply, it is formulated for the waterside corrosion prevention of metal surfaces. It has outstanding wetting properties and adheres well to power tooled cleaned areas. Apexior Number 3 is resistant to continuous immersion in fresh or salt water as well as frequently wet or high humidity environments.

Apexior Number 3 prevents pitting corrosion and stops

corrosion that has already begun — except for badly pitted areas. It aids in the reduction and prevention of tight bonding of hard scale and allows for easy cleaning and removal of scale buildup. Apexior Number 3 performs ideally with water treatment.

Epodur 786 is a 100 percent solids high build epoxy coating, which can be applied to wet or submerged surfaces and will cure in both fresh and sea water at temperatures as low as 30°F (-1°C).

Epodur 786 protects steel surfaces subjected to immersion in fresh or salt water, exposure in tidal or splash zones, or burial in soil.

It is effective on the interiors of tanks and lines containing brine, crude oil, petroleum products, sewage or strong alkalies.

It is resistant to a wide range of chemical fumes, mists and splashes. Suitability for prolonged immersion in specific chemicals should be determined by tests prior to use. Epodur 786 can be mixed with sand to make a grout for use in filling cracks in concrete, or for repairing eroded areas.

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SSPC Publishes Visuals For Waterjetting, Blast Cleaning

SSPC: The Society for Protective Coatings has published two new collections of surface preparation reference photographs: SSPC-VIS 4 and SSPC-VIS 5.

SSPC-VIS 4 illustrates the appearances of steel surfaces prepared by waterjetting while SSPC-VIS 5 shows steel surfaces prepared by wet abrasive blast cleaning. Both contain a written guide and explanatory notes, as well as additional photographs that depict degrees of flash rust after cleaning.

SSPC-VIS 4 and SSPC-VIS 5 were developed in collaboration with NACE International under the direction of the SSPC/NACE Joint Task Group on Wet Blast Visual Standards.

SSPC visual standards and reference photographs are used to access the condition of coated and/or uncoated steel before and after cleaning, and to help verify that the requirements of certain AAPC surface preparation specifications are met.

Requirements for the conditions depicted by SSPC-VIS 4 are stated in the joint SSPC/NACE surface preparation specification for high- and ultrahigh-pressure waterjetting (SSPC-SP 12/NACE No. 5), which also discusses equipment, techniques, productivity rates and safety issues. The conditions in SSPC-VIS 5 are defined by the SSPC/NACE specifications for commercial blast cleaning (SSPC-SP 6/NACE No. 3) and near-white blast cleaning (SSPC-SP 10/NACE No. 2).

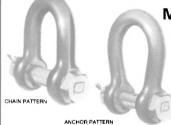
Equipment, materials and techniques are described by the joint SSPC/NACE technology report on wet abrasive blast cleaning.

The written surface preparation specifications are the primary means for verifying cleaning requirements. The visual standards and reference photographs are intended only as a supplement to the written information and are not meant to be used independently or as a substitute. However, the visual materials are produced through the same development and review processes as the written specifications and represent a consensus of balanced interests.

SSPC-VIS 4 and 5 are the most recent reference photographs published by SSPC. Previously issued SSPC visual standards include SSPC-VIS 1-89, Visual Standard for Abrasive Blast Cleaned Steel, and SSPC-VIS 3, Visual Standard for Power- and Hand-Tool Cleaned Steel.

To order the new SSPC-VIS 4 and SSPC-VIS 5, contact the SSPC Publication Sales Office by phone at (877) 281-7772 or (412) 281-2331 and by e-mail at books@sspc.org. These publications can also be ordered online through the recently updated SSPC Online Bookstore. For details, go to www.sspc.org/site/books.html and follow the "bookstore" link.

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E-Commerce

Tankerworld Expands Market Coverage

Tankerworld.com — the Internet tanker project incubated at Telemarine in London, has substantially expanded its coverage of the large tanker markets. The expansion comes after a surge of interest in the website from key tanker market players.

Tankerworld, which runs to more than 6,000 webpages dedicated solely to the oil tanker industry, works closely with key tanker brokers and the expert analysis team at Seatrends. The expansion of the site includes a full directory of tanker brokers and agents, as well as extensive search facilities on anything related to ocean going tankers. This is in addition to the existing directories of owners, charterers, vessels and yards. According to Tankerworld, the main attraction of the site is the interactive tanker fixture section that enables users to discover in some depth the current and past trading history of each tanker.

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Seabulk Launches New Web Site

Seabulk International has launched its new web site at www.seabulkinternational.com. The new site reinforces the company's recent name change to Seabulk International and the rebranding of its three primary business segments under the Seabulk trio of companies

Seabulk Offshore, Seabulk Tankers and Seabulk

Towing.

Special features include a searchable Fleet List database, including every vessel in Seabulk's 206-vessel fleet. Home pages for each of the company's subsidiaries can be accessed from the corporate home page through its Offshore, Tankers and Towing incons.

On the financial side, an Investor Relations section provides financial documents online, the latest earnings release, links to live stock and warrant quotes and a Frequently Asked Questions section. A press room feature provides information and resources for the media, and a careers section is a valuable resource for job seekers around the world, who now have the opportunity to access listings for employment in their respective fields.

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OceanConnect.com Marks Million-Ton Milestone

OceanConnect.com, the global online marketplace for the purchase and sale of marine fuels, has reached the million-ton milestone for bunkers sold by offering the only comprehensive online and offline bunker purchasing system.

Neptune Orient Lines Ltd (NOL), created the transaction that put OceanConnect over the top. Their inquiry generated 14 bids by four suppliers and closed online with Fuel and Marine Marketing LLC (FAMM).

"It is fitting that OceanConnect achieved this milestone with Neptune Orient Lines Ltd. (NOL), who is on the forefront of using technology to optimize efficiencies and costs," OceanConnect president **Tom Reilly** said.

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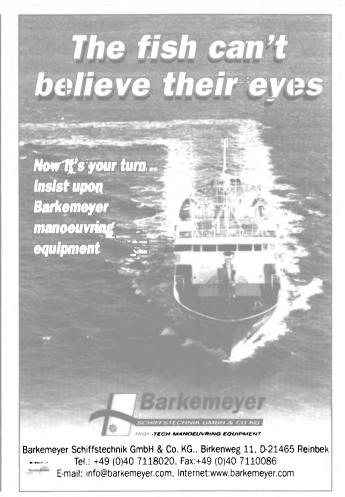
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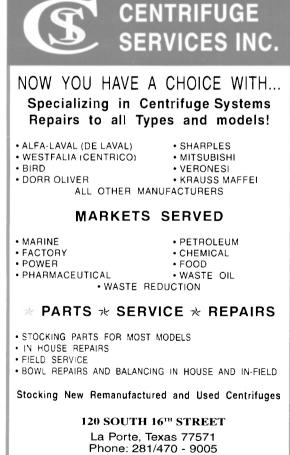
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MarineTalk Awarded \$2.1 Million For Innovative Engineering Support

MarineTalk Ltd. has been awarded the largest funding ever granted by CANARIE. This \$2.1 million funding will be of major assistance in the development of a unique engineering and procurement support software, positioning MarineTalk at the forefront of advanced business application providers.

MarineTalk is developing a sophisticated expert system and knowledge modeling software to improve business processes in the marine and other vertical markets.

Known as the Sourcing Management and Requisition Tool (SMaRT), the product will be made available using the Internet as the delivery network. This unique solution addresses engineering functions and facilitates rapid generation of well-defined and accurate technical specifications essential for the procurement and integration of complex systems and equipment.

SMaRT has the capability to revolutionize and streamline the acquisition process. Its unique expert system operates with an extensive knowledge database that includes engineering expertise and describes typical marine subsystems and equipment. SMaRT will be offered to users as a stand-alone application, in conjunction with enterprise software management systems.

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Shipanalysis Forecasts Shipping Trends On-Line

Shipanalysis provides advanced products and software for maritime and related industries covering forecasting and trend change signals in the dry cargo and tanker market, as well as forecasting for some major stocklisted shares, such as Frontline, TK, OSG, OMI and Knightsbridge Tankers.

The company has gone a step ahead with the design of a small, resource friendly, easy-to-use application which is mainly a graphical user interface (GUI) displaying different databases compiled by Shipanalysis.

The program, which can be loaded directly from the desktop or start menu covers the following: 50,000-plus distances between ports world wide, 6,000-plus ports; 500-plus tanker terminals; latitude/longitude positions for all ports and terminals; tanker terminals includes name, type, operator and restrictions; and URL links to port authorities and/or agents worldwide.

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News

Wärtsilä Engines To Power Queen Mary 2

Wartsila Corporation will deliver four Wärtsilä 46 EnviroEngines totaling 67.2 MW power output for Cunard Line's new luxury transatlantic liner, Queen Mary 2. These engines will incorporate the latest common-rail fuel injection technology for operation without any visible smoke.

Due for delivery in late 2003 by the French shipbuilder Chantiers de l'Atlantique in Saint Nazaire, Queen Mary 2 will be the world's largest passenger vessel. Measuring 1,131 x 131.2 ft. (345 x

40 m) and drawing 32 ft. (10 m), the 150,000 grt liner will have a maximum speed of about 30 knots. Electrical power for propulsion and all shipboard services will be generated by a 115.5 MW combined diesel- and gas turbineelectric power plant. Propulsion will be by four electrically driven podded dri-

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ves, two fixed and two azimuthing.

The four Wartsila 16V46 Enviro-Engines will be manufactured at Wartsila's Turku factory in Finland. They are due to be shipped in June 2002. The engines will each have a maximum continuous output of 16,800 kW (22,840 bhp) at 514 rpm. For redundancy, the diesel generating sets will be housed in two separate engine rooms on board the Queen Mary 2.

The Wartsila EnviroEngine arose from a joint project between Carnival Corporation, the parent company for Cunard Line, and Wartsila Corporation to develop a new "earth-friendly" power system.

The Wartsila 46 EnviroEngines use an electronically-controlled common rail fuel injection system which enables injection pressures to be kept sufficiently high at all engine loads and speeds even at the lowest levels — to achieve clean combustion with no visible smoke emissions.

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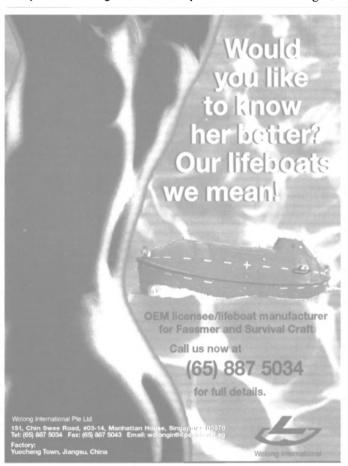
U.S. Port Security Is Tightened Further

The U.S. Coast Guard (USCG) has advised that it is in the process of instituting a new port security measure. USCG categorically denies the rumors that vessels flying specific countries' flags and their crews are being totally banned from entering U.S. ports.

The USCG is currently working on a change to their notice of arrival regulations that will increase the advance notice requirements to 96 hours (currently 72 hours). While the USCG expect that regulation changes will be published throughout the month of October, members are encouraged to submit the required crew and passenger list to USCG as soon as possible after the vessel departs its last port to facilitate clearance into its US destination port.

In addition, ship operators should work directly with the appropriate USCG Captain of the Port (COPT) for information on any local restrictions that may be in place.

This new measure is not part of the long-standing Special Interest Vessel (SIV) Program. It is an effort to ensure that suspect individuals and individuals with criminal records do not enter the country unbeknown to federal officials. Each Captain of the Port (COTP) has discretion with regard to how the policy is enforced, depending on local conditions. Some COTPs are also more carefully scrutinizing vessels that have made recent port calls in ports of specific nations, but there is no uniform policy in this regard.



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Modeling and

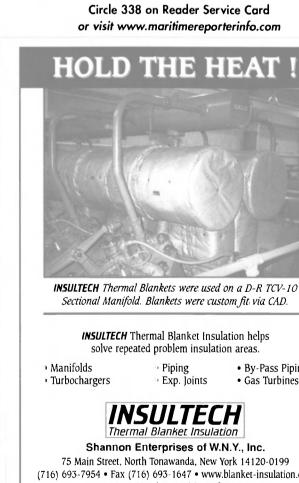
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Salvor's system

.Economy system

Ship Stability and Strength Software:

GHS LOAD MONITOR.....Onboard system

BHS/YACHT.....Yacht designer's system

GHS/SALVAGE...

70

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The new EPOCH 4 is the latest addition to the Panametrics flaw detector line, representing the fourth generation of instruments since the pioneering EPOCH 2001, the world's first portable digital flaw detector. Lighter, easier-to-use, with a faster display rate, this powerful flaw detector provides unsurpassed ultrasonic performance,

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Hoffer Flow Controls

Hoffer Flow Controls supplies flow measurement products for shipboard flow processes with experience in applications including fuel flow measurement for the propulsion plant, R/O system flow measurement, flow switches for use in the fire control system, trim and drain/ballast systems and more. Hoffer also handles vari-

ous flow applications on floating oil and gas production facilities either located subsea or on the surface.

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noid valves, flame arrestors & system electronics. An internal leak detector provides complete system integrity in compliance with the latest class regulations.

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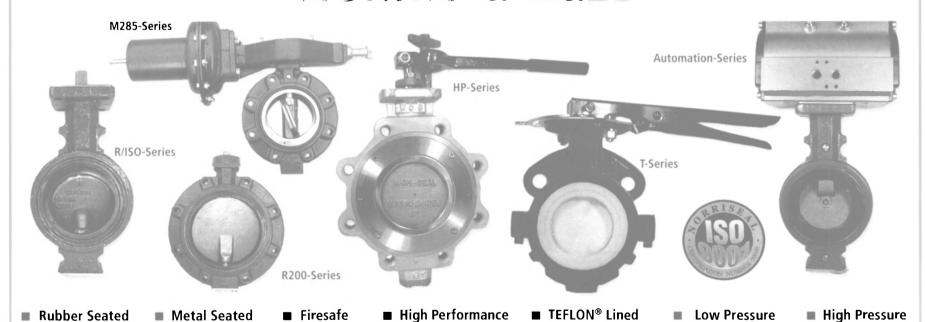
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(continued on page 75)

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Keppel Hitachi Zosen Delivers Semi-tender Rig

Keppel Hitachi Zosen (KHZ) has delivered a Semi-Submersible Self-Erecting Tender Rig (SSETR) to Smedvig Asia Ltd (Smedvig). The SSETR was named West Alliance by Mrs. Patricia Chan, wife of Mr. Chan Heng Wah, Drilling Manager of Esso Production Malaysia Inc, at a naming ceremony held in Keppel Shipyard on September 29, 2001.

West Alliance has a one plus one optional year drilling contract with Esso Malaysia, which is scheduled to commence in early November this year. Following the exercise of its option, Smedvig will own 100 percent of West Alliance, and bring the total capital expenditure of the rig to about \$85 million. West Alliance represents the newest generation of SSETRs, incorporating the latest technology and equipment. It is designed for deepwater drilling operations in combination with floating wellhead platforms in benign

Although similar in design and specifications to West Menang, West Alliance has increased deckload capacity of up to 3,300 dwt and larger accommodation facilities to accommodate 130 people. Keppel Hitachi Zosen is one of the largest and most versatile ship repair and shipbuilding groups in Asia. It has the expertise to undertake the repair, conversion and the building of a diverse range and capacity of vessels.

The Group comprises Keppel Shipyard, Hitachi Zosen Singapore and Keppel Singmarine Dockyard in Singapore. Its overseas yards are in the Philippines and the Middle East.

Smedvig Asia, based in Singapore, is a wholly owned subsidiary of a leading offshore drilling contractor, Smedvig asa, with headquarters in Stavanger, Norway. Smedvig has had a strong and increasing presence in the South East Asia petroleum market since 1990 when they purchased drilling contractor, Robray Offshore Drilling Company.

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Logica to Help Develop Next-Generation Network For Inmarsat

Logica, the global solutions company, has secured a \$9 million contract to help develop future higher bandwidth satellite communications for global mobile satellite communications provider, Inmarsat Limited.

This contract forms part of an over \$45 million program with Thrane & Thrane, a leader in the market for satellite communications equipment, to build the satellite interface and other equipment that will allow Inmarsat's Broadband Global Area Network (B-GAN) services due for launch during 2004 to be transmitted to and from terrestrial networks.

Currently Inmarsat operates its Global Area Network (GAN) service which supports data speeds of up to 64 kbs, almost seven times faster than speeds offered by current GSM networks. Its B-GAN services are planned to provide higher bandwidth services at data speeds of up to 432 kbs based on mobile packet data technology. These are expected to be delivered via two new satellites on a virtual global basis to 80 percent of the land mass in which users of Inmarsat's existing services operate.

Logica and Thrane & Thrane have been contracted to jointly develop, produce and install a Radio Access Network (RAN), which supports satellite communications connectivity between Inmarsat users and the terrestrial network. Logica will supply Thrane & Thrane with a satellite interface which will be a key element of Inmarsat's B-GAN solution. This critical component supports the transfer of multimedia traffic streams between the satellites and the core network.

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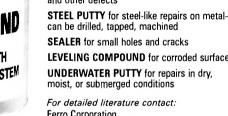
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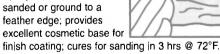
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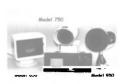
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OWNER OPERATOR	COUNTRY SO	SHIPYARD	COUNTRY SB	ТҮРЕ	No	TEU	DWT	DELIV	PRICE M S
VESSEL MANAGEMENT SERVICES	US	BAY SHIPBUILDING	U.S.	BARGE	2	_	20000	02	NA
CERES HELLENIC (G P LIVANOS) NIPPON YUSEN KAISA (NYK)	GREECE JAPAN	SASEBO OSHIMA SHIPBUILDING	JAPAN JAPAN	BULK CARRIER BULK CARRIER	2	_	170000 90000	02 02	80 26
SAFETY MANAGEMENT OVERSEAS	GREECE	TSUNEISHI	JAPAN	BULK CARRIER	2	_	76000	04	NA NA
MI-DAS LINE SAMOS STEAMSHIP	— GREECE	KANASASHI CO. HITACHI ZOSEN	JAPAN JAPAN	BULK CARRIER BULK CARRIER	1	_	75500 75000	02 03	NA 21.5
NKK CORP	JAPAN	TSUNEISHI CEBU	JAPAN	BULK CARRIER	6	_	52000	02/03	NA
MI-DAS LINE CLIPPER GROUP	— DENMARK	SHIKOKU DOCKYARD JING JIANG	JAPAN CHINA	BULK CARRIER BULK CARRIER	1	_	29000 27000	02 03	NA 36
UNKNOWN	_	NKK CORP.	JAPAN	BULK CARRIER ORE STRENGTHENED	2	_	172000	02/04	NA NA
COECLERICI TRANSPORT POOL ATLANSKA PLOVIDBA	italy Croatia	SASEBO Ulianik	JAPAN CROATIA	BULK CARRIER ORE STRENGTHENED BULK CARRIER ORE STRENGTHENED	1	_	170000 75000	02 03	NA NA
K LINE	JAPAN	OSHIMA SHIPBUILDING	JAPAN	BULK CARRIER ORE STRENGTHENED	į	_	74000	02	23
ITOCHU CORP UNKNOWN	JAPAN —	SANOYAS CORP. TSUNEISHI CEBU	JAPAN PHILIPPINES	BULK CARRIER ORE STRENGTHENED BULK CARRIER ORE STRENGTHENED	2	_	65000 52200	02 02	NA NA
CLIPPER GROUP	DENMARK	JING JIANG	CHINA	BULK CARRIER ORE STRENGTHENED	i	_	51000	03	NA
NEW SPIRIT LINE DOUN KISEN	 JAPAN	OSHIMA SHIPBUILDING OSHIMA SHIPBUILDING	JAPAN JAPAN	BULK CARRIER ORE STRENGTHENED BULK CARRIER ORE STRENGTHENED	1	_	47900 36575	02 03	NA NA
SIMISE KAIUN	JAPAN	SHIN KOCHI JUKO	JAPAN	BULK CARRIER ORE STRENGTHENED	i	_	17000	03	NA NA
ER SCHIFFAHRT HANJIN SHIPPING CO.	GERMANY KOREA	Samho New Shipyard Hanjin	KOREA Korea	CONTAINER CONTAINER	2	6000	37560	03	NA NA
E. R. SCHIFFARTS	GERMANY	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	CONTAINER	2	3581	=	00	NA NA
NVA ORIENT MARITIME	GERMANY JAPAN	Shanghai Shipyard Shin Kurushima	CHINA JAPAN	CONTAINER CONTAINER	2	3130 2600	_	03 02/03	NA NA
GEBAB	GERMANY	THYSSEN NORDSEEWERKE	GERMANY	CONTAINER	ĺ	2500	_	02/03	30.7
LEONHARDT & BLUMBERG LEONHARDT & BLUMBERG	GERMANY GERMANY	GUANGZHOU GUANGZHOU	CHINA CHINA	CONTAINER CONTAINER	2 2	1520 1400	_	02/03	NA
YANG MING MARINE CORP	TAIWAN	IMABARI SHIPBUILDING	JAPAN	CONTAINER	3	1400	_	03/04 03	NA NA
WORDEN, K.W.T BRIESE SCHIFFAHRT, GMBH	GERMANY GERMANY	ZHONGHUA SHIPYARD WEIHAI	CHINA CHINA	CONTAINER CONTAINER	2	1370	_	03	NA
REEDEREI KARL SCHLUTER	GERMANY	DAMEN SHIPYARDS	NETHERLANDS	CONTAINER	3	1300 850	_	03 03/04	NA NA
NAVIGIA FERROSTAAL	NETHERLANDS GERMANY	DETLEF HEGEMAN GALATZ	GERMANY ROMANIA	CONTAINER CHEMICAL TANKER	1	700	_	02	NA
IINO KAIUN	JAPAN	SHIN KURUSHIMA	JAPAN	CHEMICAL TANKER CHEMICAL TANKER	1	_	85000 30000	02	NA NA
PG & M CASTALDI	ITALY	CANTIERE NAVALE FRATELLI ORLANDO	ITALY	CHEMICAL TANKER	1	_	23000	03	38.5
UNKNOWN IINO KAIUN	 JAPAN	SHIN KURUSHIMA FUKUOKA SHIPBUILDING	JAPAN JAPAN	CHEMICAL TANKER CHEMICAL TANKER	1	_	19300 19000	02 02	NA NA
ULTRAGASA	_	IZAR	SPAIN	CHEMICAL TANKER	i	_	19000	03	NA
IINO KAIUN UNKNOWN	JAPAN —	USUKI MUTZELFELDTWERFT	JAPAN GERMANY	CHEMICAL TANKER CHEMICAL TANKER	1	_	19000 16000	02 03	NA NA
JAPANESE GOVT.	JAPAN	ASAKAWA SHIPBUILDING	JAPAN	CHEMICAL TANKER	2	_	14000	02	NA
CLIPPER GROUP KOYO KAIUN KK	DENMARK JAPAN	YARDIMCI KURINOURA	TURKEY JAPAN	CHEMICAL TANKER CHEMICAL TANKER	1	_	10000 9500	02 02	16 NA
WOOLIM SHIPPING	KOREA	NOK-BONG	KOREA	CHEMICAL TANKER	i	_	7800 7800	03	10.6
BESIKTAS SHIPPING EXXON	TURKEY U S	Marmara Shipyard Hyundai Heavy Industries (HHI)	TURKEY KOREA	CHEMICAL TANKER FPSO	2	_	7100	02	22
NKNOWN	_	SHIN KURUSHIMA	JAPAN	GENERAL CARGO	i	_	9900	04 02	800 NA
UNKNOWN ERIK THUN	_	SHIN KOCHI JUKO	JAPAN NETHERLANDS	GENERAL CARGO	1	_	6300	02	NA
UNKNOWN	_	FERUS SMIT BODEWES VOLHARDING	NETHERLANDS	GENERAL CARGO GENERAL CARGO	2	_	4775 4200	03 04	NA NA
UNKNOWN	-	SHIN KURUSHIMA	JAPAN	GENERAL CARGO	1	_	1850	02	NA
UNKNOWN H&K HEINRICH	— GERMANY	.VOLHARDING J.J. SIETAS	NETHERLANDS GERMANY	GENERAL CARGO HEAVY-UFT CARGO	2	502 830	_	02 03	NA NA
NIGERIAN NAT PETROLEUM	NIGERIA	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	ING	4	_	77000	05/06	680
k line Golar ing	Japan Norway	Kawasaki H.I. Daewoo	Japan Korea	ING ING	1	_	75000 72000	05 304	NA 165
EXMAR	BELGIUM	DAEWOO	KOREA	ING	1	_	69000	05	165
LEIF HOEGH / MOL K LINE	NORWAY/JAPAN JAPAN	MITSUBISHI H.I. MITSUI	JAPAN JAPAN	ING LNG	2	_	67300 66400	06 05	NA NA
GOLAR LNG	NORWAY	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	LNG	i	_	_	04	165
BRITISH GAS TAIYO KAIUN	UK JAPAN	SAMSUNG HITACHI MAKAISHIMA	KOREA JAPAN	LNG LPG	2	_	1200	04/05 02	326 NA
PETREDEC	BERMUDA	ZHEJIANG	CHINA	LPG	i	_	_	02	9.5
TAUBATKOMPANIET CHINESE-POLISH JSC	NORWAY CHINA	JINLING SHANGHAI SHIPYARD	CHINA CHINA	MULTI-FUNCTION SERVICE MULTI-PURPOSE	2	_	30000	03 03	NA 120
TRANSTEJO TRANSPORTES	PORTUGAL	AUSTAL SHIPS	AUSTRALIA	PASS/FERRY	2	_	_	02	5
UNKNOWN OTTO CANDIES	U.S.	XINHE HOUMA	CHINA U S	PASSENGER / CARGO PLATFORM SUPPLY VESSEL	1	_	_	03 02/03	NA NA
SANKO KISEN	JAPAN	SUMITOMO	JAPAN	PRODUCTS TANKER	1	_	105000	02/03	40
CHINA SHIPPING GROUP (CSG) CHINA SHIPPING GROUP (CSG)	CHINA CHINA	HUDONG SHIPYARD JIANGNAN	CHINA CHINA	PRODUCTS TANKER PRODUCTS TANKER	2 2	_	75000	04	74
D'AMATO DI NAVEGAZIONE	ITALY	HUDONG SHIPYARD	CHINA	PRODUCTS TANKER	2	_	75000 72000	04 03	NA 66
TSAKOS GROUP	GREECE	IMABARI SHIPBUILDING	JAPAN JAPAN	PRODUCTS TANKER	2	_	68000	02/03	60
MITSUI O.S.K. LINES (MOL) ASAHI TANKER	JAPAN JAPAN	IWAGI IWAGI	JAPAN	PRODUCTS TANKER PRODUCTS TANKER	1	_	48000 48000	04 04	NA NA
BYZANTINE INTEGRITY SHIPPING	GREECE —	3 MAJ	CROATIA KOREA	PRODUCTS TANKER PRODUCTS TANKER	1	_	47000	03	28
SOVCOMFLOT	RUSSIA	hyundai heavy industries (HHI) Hyundai mipo	KOREA	PRODUCTS TANKER	2	_	47000 47000	03 03	NA 58
NOVOSHIP	RUSSIA	ULIANIK	CROATIA	PRODUCTS TANKER	2	-	47000	04	58
SK SHIPPING SOCIETA ATTIVITA MARITTIME ED AEREA (SAMA	KOREA NITALY	HYUNDAI MIPO JIANGDU SHIPYARD	KOREA CHINA	PRODUCTS TANKER PRODUCTS TANKER	2	_	46000 46000	03/04 03/04	NA 106
CIDO SHIPPING	JAPAN	SHIN KURUSHIMA	JAPAN	PRODUCTS TANKER	1	_	45800	03	NA
OMI CORPORATION TORM A/S	u s. Denmark	BRODOSPLIT DAEWOO	CROATIA KOREA	PRODUCTS TANKER PRODUCTS TANKER	2	_	45000 45000	02 03	62 NA
MITSUI O.S.K. LINES (MOL)	JAPAN	MINAMI NIPPON	JAPAN	PRODUCTS TANKER	ĩ	_	45000	03	29
NISHIYAMA KISEN HAEDONG	Japan Korea	KURINOURA HUDONG SHIPYARD	Japan China	PRODUCTS TANKER PRODUCTS TANKER	1	_	4990 3400	01 01	NA NA
NANIWA TANKER	JAPAN	yamanaka zosen	JAPAN	PRODUCTS TANKER	ĩ	_	2400	01	NA
IZUMI KISEN PENANG PORT	JAPAN —	YAMANISHI SHIPBUILDING NAVAL DOCKYARD	JAPAN MALAYSIA	RORO RORO	1	_	8000 440	02 02	NA NA
ATWOOD OCEANICS	US	KEPPEL FELS	SINGAPORE	SEMOD	i	_	_	03	125
MITSUI & CO WORLD-WIDE SHIPPING	JAPAN BERMUDA	HITACHI ZOSEN DAEWOO	Japan Korea	TANKER TANKER	2	_	300000 297000	03 03/04	160 288
WAH KWONG SHIPPING	HONG KONG	HITACHI ZOSEN	JAPAN	TANKER	ī	_	296000	03/04	75
KRISTEN NAVIGATION ONASSIS GROUP	GREECE MONACO	DAEWOO NAMURA ZOSENSHO	KOREA JAPAN	TANKER TANKER	2	_	159000	03/04	NA 104
PETROBRAS	BRAZIL	EISA SHIPYARD	BRAZIL	TANKER	2	_	156000 130000	04	104 154
SEAARLAND SHIPPING STEALTH MARITIME	AUSTRIA GREECE	SANOYAS CORP IMABARI SHIPBUILDING	JAPAN JAPAN	TANKER TANKER	2	_	114000	03	80
TAI CHONG CHEANG STEAMSHIP (TCC)	HONG KONG	KOYO DOCK	JAPAN JAPAN	TANKER	1	_	110000 107000	03 03	41 41
TCC	_	IMABARI SHIPBUILDING	JAPAN KOREA	TANKER	1	_	105000	03	NA
MITSUI (para CHEVRON) PREMUDA	JAPAN ITALY	SAMSUNG SAMSUNG	KOREA Korea	TANKER TANKER	2	_	105000 71000	104 03	42 NA
PETROBRAS	BRAZIL	EISA SHIPYARD	BRAZIL	TANKER	2	_	70000	_	94
NYNAES VESSEL MANAGEMENT SERVICES	U.S.	SHANGHAI EDWARD MARINETTE MARINE CORP	CHINA U.S.	TANKER (BITUMEN) TUG	2 2		6000	03	NA NA
SINGAPORE INTERESTS	SINGAPORE	WUXI	CHINA	TUG	2	_	_	01	NA
SUD AMERICANA DE DRAGADOS UNKNOWN	_	YUEXIN PAN:UNITED SHIPYARD	CHINA SINGAPORE	TUG UTILITY VESSEL	1	_	_	01 02	NA 15
JAPANESE INTERESTS	JAPAN	IWAGI	JAPAN	WOOD CHIP CARRIER	1	_	23000	01	NA
74									



and harsh environments. With no illuminators required, the cameras can be used even in total darkness, smoke and

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Statistics show that failures in hull structures have been the reason for every third serious bulk carrier casualty. Hullmos, a hull stress monitoring system, has especially been developed to improve safety at sea. The system alarms

when there is a risk of damage to the hull structures or cargo caused by improper loading or high speed in heavy weather.

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There's a simple solution to virtually every product removal challenge you face: highpressure water jetting from NLB Corp. With NLB water jets (1,000 to 40,000 psi, or 70 to 2,800 bar) you can

quickly remove built-up residue or clear clogged tubes and screens. Water iets cut quickly and cleanly through a wide range of materials, without any blades to be sharpened or sanitized. Circle No. 118

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Kockum Sonics AB

Sweden-based The company Kockum Sonics AB, the supplier of the original TYFON, has recently

launched a new multi-purpose sound and light signal controller called TLG 2000.

The unique TYFON whistle, air-, electricallyor electronically driven is available for all kind

Now the TYFON family has received a modern and newly designed controller unit. The new controller runs on 115-230 V AC or 24 V DC consuming 15W and is enclosed according to IP65.

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Soundcoat Co.

The Soundcoat Company has been involved in noise control for the marine industry since 1963. Working with naval architects, the U.S. Navy, boatyards and marinas, Soundcoat has



provided solutions to a wide variety of shipboard noise problems for vessels of all sizes. Soundcoat products are manufactured to the highest standards, and are subject to continuous quality control.

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TechnoFIBRE

TechnoFIBRE provides professional lifeboat and davit maintenance worldwide. ISO 9002 Certified, it is also an authorized service company to over 20 lifeboat and davit

manufacturers.

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Armortec has provided Erosion Control Solutions and Professional Support for more than 20 years in the following: Flood Channel and Culvert Lining, Boat Ramps and Access Roads, Coastal and

Wave Applications, Spillways and Retention Basins, Pipeline and Cable protection.

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HRP Thruster Systems

The line of HRP Thruster Systems products, comprising of: 360-degree steerable propulsion units; retractable azimuth thrusters and tunnelthrusters are

designed, marketed, sold and manufactured by HRP Thruster Systems, located in Krimpen aan de Lek in the vicinity of Rotterdam.

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Merewido

Merewido Holland BV is a specialist in the development and manufacture of pneumatic transport systems. The company's extensive product line includes a choice selection of pneumatic transport systems

for various target groups.

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Wheelabrator Abrasives

Angular-shot cleans faster than standard shot and thereby reduces to overall cleaning costs when compared with shot.

Studies show that the performance characteris-

tics of Angular-shot are similar to steel shot but also have the extra initial aggressiveness of an angular material. Angular-shot is used when you want a smoother peened surface and GB, GL or GH grit can be used when you want a matte finish with a good anchor pattern for overcoating.

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E.H. O'Neil

A-60 Decking lightweight non-combustible, insulating approved by Lloyd's Register, DNV, Germanischer Lloyd, U.S. & Canadian Coast Guards.

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Aqua-Dyne, Inc.

Aqua-Dyne 1 has been manufacturing water-jetting equipment, systems and parts for more than 29 years. These units typically operate at 10,000 to 40,000 psi and are used in surface preparation, internal

cleaning of pipes and heat exchangers, concrete removal (hydrodemolition), and as cutting alternative to saw blades and laser cutting machines for parts fabrication.

Circle No. 127 www.maritimereporterinfo.com



Aqua-Strip

Back To Nature Products Co. introduces Aqua-Strip Safer Marine Paint & Varnish Remover. It removes multiple layers of bottom and topside coatings in one application.

Aqua-Strip is environmentally safe, biodegradable, non-flammable and contains no methylene chloride.

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Adrick Marine

Adrick Marine was the turn-key provider of the entire HVAC system onboard a new casino boat constructed at Washburn and Doughty shipyard. The project included the supply of

the chilled water air conditioning equipment, air handling units, fan coil units, toilet exhaust fans, fresh air blowers and engine room supply and exhaust fans.

Circle No. 129 www.maritimereporterinfo.com



Chugoku Marine Paints (CMP)

CMP manufactures synthetic resin paints, specializing in paints for marine vessels. The new Nova 5000 Barrier is designed especially for ballast water tanks. The

barrier is designed to be easily applied at a high film thickness and then prevents water penetration, and corrosion is halted. The new Umeguard Super-H, a highly abrasive cargo holding coating, is designed to extend the period between major grit blasting of cargo hold up to 50 percent.

Circle No. 130 www.maritimereporterinfo.com



with IOOMM lens

D&B Technology/ Hoteye

The HOTEYE PT8 is a fixed-mount, pan/tilt infrared camera. Designed specifically for harsh outdoor environments, the camera is

enclosed in a dry-nitrogen pressurized housing and protected against EMI. The unit can also

be attached to an electronically controlled pan/tilt assembly if needed.

Circle No. 131 www.maritimereporterinfo.com



Miller Electric

Miller Electric has introduced the Suite-Case 8VS, a voltage sensing wire feeder designed to meet the portability and performance needs of ship-yard welding applica-

tions. With an empty weight of 23.5 lbs., the SuiteCase 8VS weighs two to 10 lbs. Less than competitive units. Its slim profile-14.5 x 6.5 x 15-5/8 permits easy maneuvering through tight portholes.

Circle No. 132 www.maritimereporterinfo.com



Jan Verhaar Omega Thrusters

Jan Verhaar builds reliable, long-life Omega bow and stern thrusters, with a thrust direction that's adjustable over 360 degrees. Omega thrusters will keep any ship on the right course.

They're the ideal complement to a DF system with a Bollard Pull of 24.9 LBF/kW. The complete construction is placed inside the ship, so no vulnerable parts under the bottom plate. The state-of-the-art Omega thrusters are available with power ratings from 150 to 1,500 kW.

Circle No. 133 www.maritimereporterinfo.com



King-Gage

LevelPRO multiple tank processor provides continuous monitoring of liquid levels in cargo or service tanks. The processor accepts up to eight transmitter inputs (4-

20 mA), supplies 24 Vdc excitation, overload protection and multidrop network connectivity up to 256 inputs. **Circle No. 134 www.maritimereporterinfo.com**



Alaska Cargo Transport (ACT)

Alaska Cargo Transport, Inc. (ACT) is a common carrier and project cargo company, with weekly scheduled services from Seattle to

Central Alaska. ACT also operates four vessels in the charter market between ports in Europe and Africa. **Circle No. 135**

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Neutrarust

The entire family of Neutra Rust products have been proven extremely effective in a variety of highly



corrosive environments. All Neutra Rust products are

non-toxic, non-hazardous and non-flammable,

in addition to being environmentally and ecologically safe. They are used on oil and natural gas pipelines, offshore drilling rigs, and aboard numerous commercial marine vessels. These versatile products also have numerous uses in industrial, government and institutional settings.

Circle No. 136 www.maritimereporterinfo.com



Machine Support

Machine Support is a service organization in the marine field for the erection, alignment and mounting of both main propulsion units and auxiliary equipment. The company offers an all-round engineering

service and can obtain the necessary certification from classification societies.

Circle No. 137 www.maritimereporterinfo.com



Geislinger

Geislinger GmbH is located in Salzburg, Austria and produces torsional vibration dampers as well as elastic damping couplings for diesel and gas engines. Geislinger

products are used for the propulsion of ships, powerplants, trains and hydraulic excavators. They are reducing torsional vibrations and protect the shafts, camshafts and crankshafts as well as the gears.

Circle No. 138 www.maritimereporterinfo.com



Kelvin Hughes

Kelvin Hughes is the Naval and Marine Division of Smiths Group Plc and is responsible for naval, marine and radar products. The company has been providing maritime equipment and supplies for

more than 200 years.

Today, Kelvin Hughes has a worldwide reputation for naval and maritime navigational radar and ships navigational systems. The company is one of the world's largest marine navigational charts and correcting agent.

Circle No. 139 www.maritimereporterinfo.com

Goodway

Goodway Technologies Corporation was



founded in 1966 by Per K. Reichborn. Since its earliest days, the

company has built a reputation for manufacturing the highest quality cleaning systems in the world.

Goodway's current product line encompasses a wide range of tube/pipe cleaners, duct cleaners, vacuums, floor machines, hi-pressure washers, and other maintenance related equipment.

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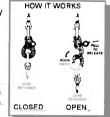
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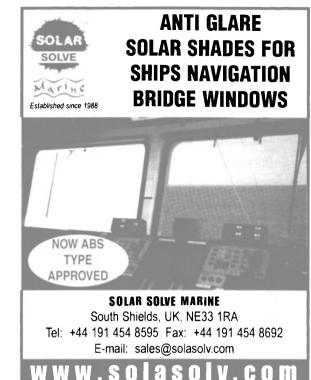
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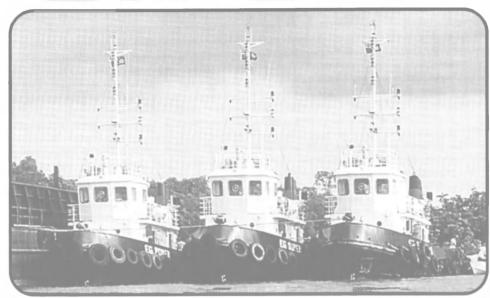


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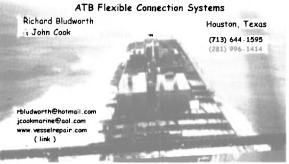
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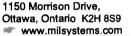


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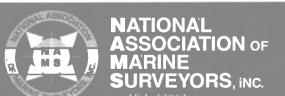
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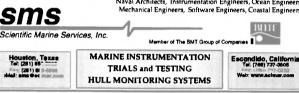
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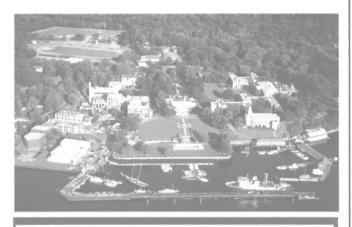
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