

MARITIME REPORTER AND ENGINEERING NEWS

No Smoke

Carnival Spirit features the much anticipated "smokeless" diesel engines

Meet the "Floating Volvo"

Hyundai is nearing completion of the innovative V-MAX twin engine VLCC

Bunkers Gone Bad?

IBIA contends that the bunker barge business has gotten a bad rap

Rotting Away

A team of investigators has cited "hyper accelerated corrosion" as the cause of the Castor problem

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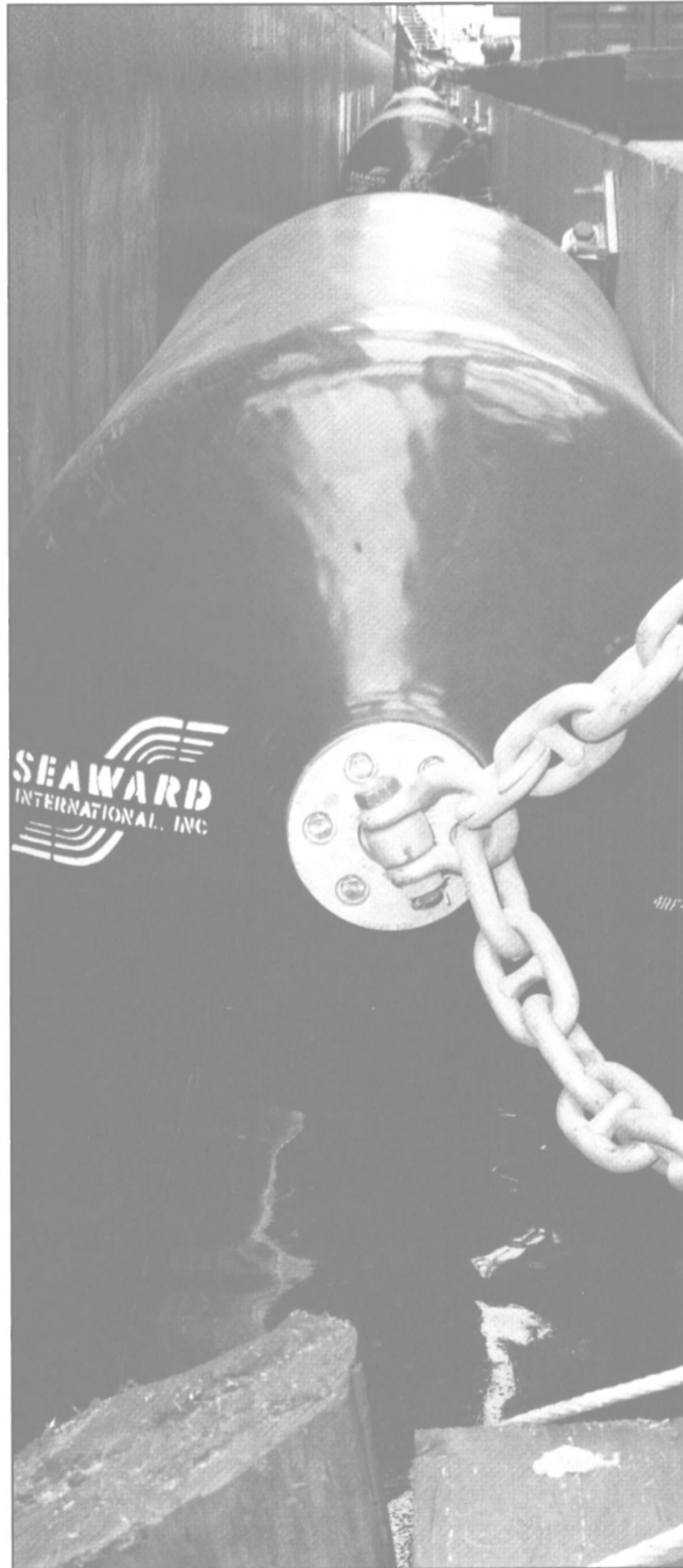
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On the Cover: Carnival Spirit recently made its way from Kvaerner Masa-Yards' New Helsinki Shipyard to the U.S. The ship, of the Panamax-Max type, boasts a number of interesting features, including smokeless diesel engines and balconies for 70 percent of all passenger rooms. See story page 44.

8 Hapag Lloyd Goes Big

Germany's Hapag Lloyd will, this fall, get the first in a new series of innovative 7,500 TEU containerships. Also, **Wartsila Corporation** has broken with the traditional 12-cylinder limit on in-line diesel design, by proposing a 14-cylinder version of its potent Sulzer RTA96C series.— by **David Tinsley**



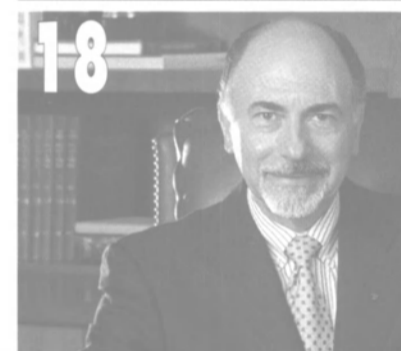
12 Welcome the "Floating Volvo"

The first in a series of ground-breaking, twin engine VLCC, the Stena Vision, was recently christened at Korea's Hyundai Heavy Industry. The ship reportedly will set new standards for safety and operation.



18 Hyper Corrosion Hurt Castor

Clues to why an otherwise healthy ship developed a near fatal deckplate crack are now being found by ABS.

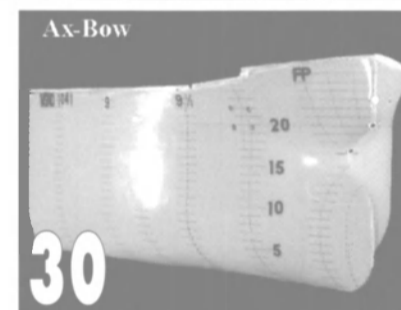


24 One Builder

General Dynamics' \$2.6 billion bid to buy Newport News Shipbuilding looks as though it will face little resistance.

30 Cutting Through the Waves

A group of engineers from the Tsu Research Lab has developed a new bow design, which its claims will allow a 20 to 30 percent reduction in a ship's sea margin.



38 Fuel & Lube Report: Bargaining Ahead

Chris Leigh-Jones, chairman of IBIA, defends the practice of barge operators in the marine fuels industry, and contends that nowhere is the expertise of barge to ship transfers demonstrated than in the U.S.

44 A New Spirit on the Water

Carnival Spirit was delivered by Kvaerner Masa-Yards, Helsinki, and the Panamax-max ship, from its "smokeless" diesel engines to its eclectic interior style, is truly a testament to Finnish cruise ship building prowess.



14 **New & Notable** IZAR hits new RoPax heights

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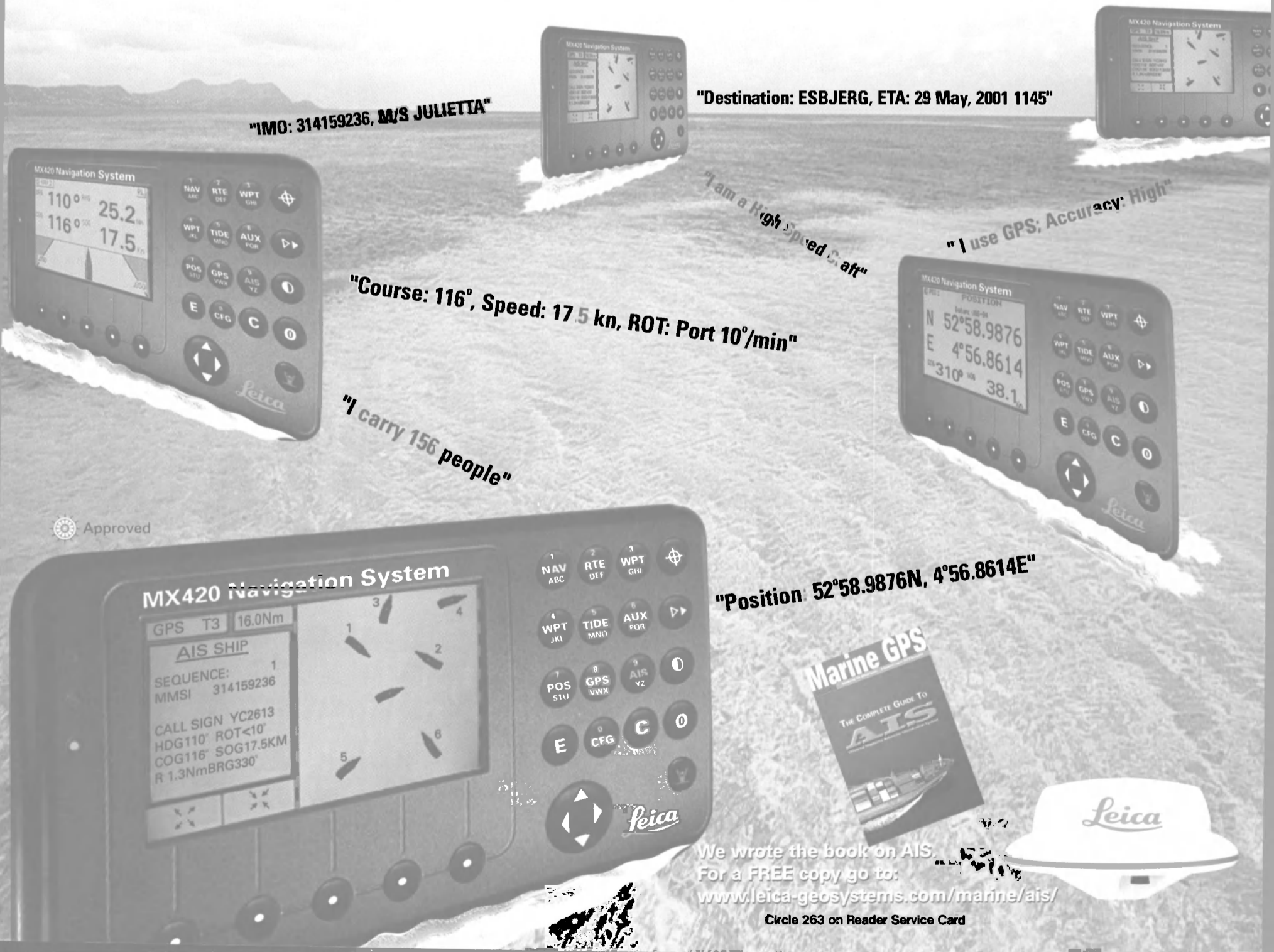
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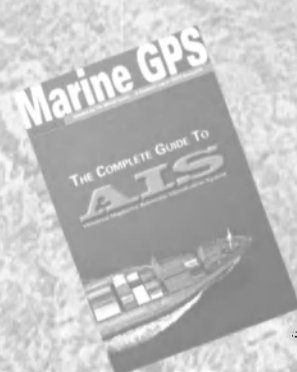
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EU Subsidy Program To Be Considered

The long-running feud regarding shipbuilding subsidies is far from complete, and word is that the EU is proposing to subsidize its embattled shipyards in a long-standing dispute over what it views as unfair competition from South Korea. The EU will reportedly make the proposal to an EU industrial council meet-

ing in Sweden on May 15. The EU, which has been holding talks with South Korea about the issue for the past two years, could take the case to the World Trade Organization (WTO), but that could take many years, thus the move for a subsidy program of its own. Accusations have arisen that the South Korean government was supporting the Korean shipbuilding industry through debt forgiveness programs by state-con-

trolled banks, in essence allowing Korean shipbuilders to build ships at up to 40 percent below costs. The Korean Shipbuilders' Association maintains that the country's shipbuilders have won market share through increased cost efficiency and quality following substantial investments. Last year, Korean shipyards received nearly 38.7 percent of global orders, compared to 25 percent for Japan and 16 percent for the EU.

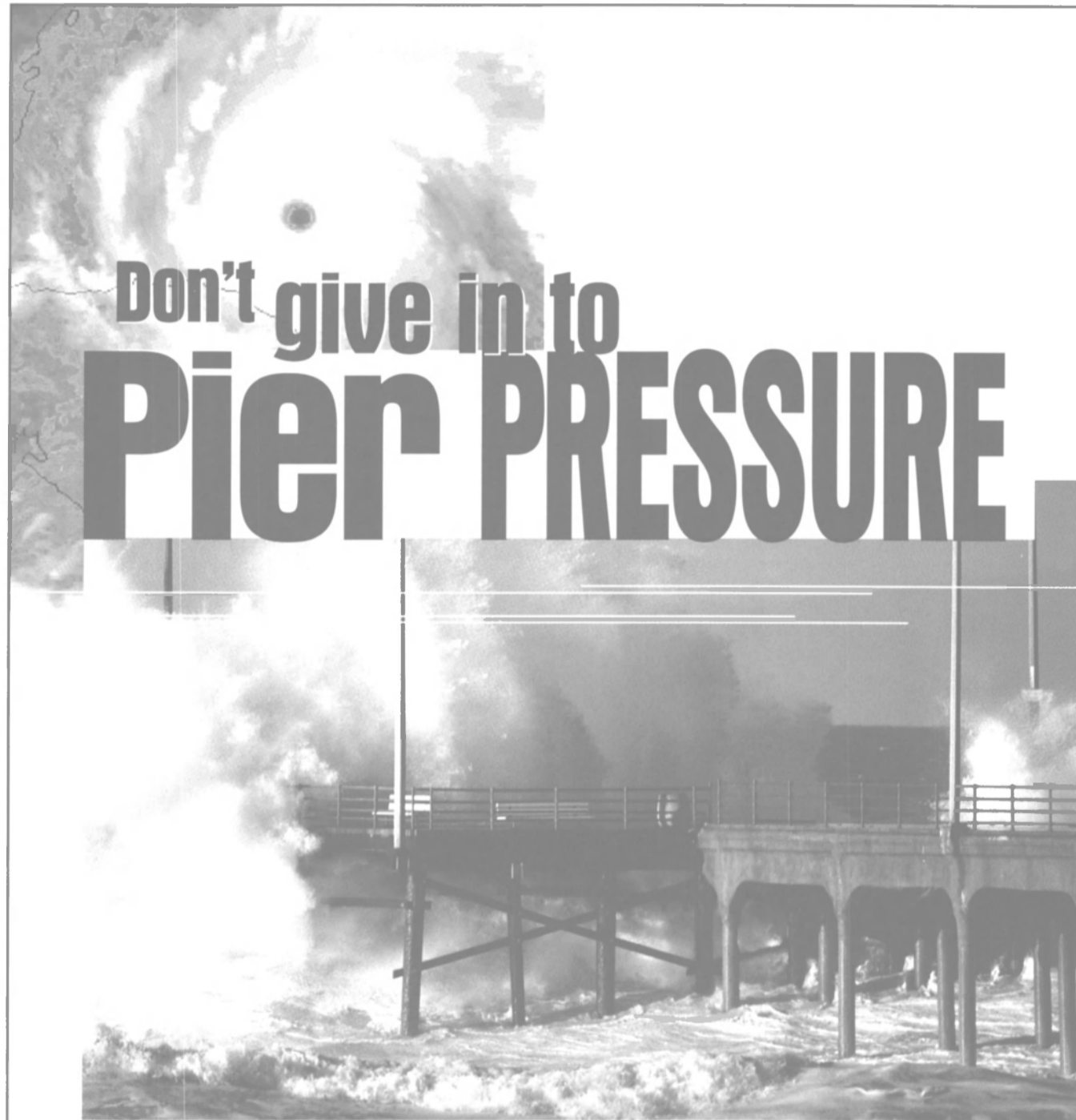
Nichols Brothers Delivers 39-knot Catamaran

The transit between Long Beach and Catalina Island will be reduced to "well under" one hour when the "Jet Cat Express" joins the Catalina Express fleet. "This will take place before Memorial Day," according to **Greg Bombard**, president of the California company. The 381-passenger, 145-ft. (44.1 m), 39-knot catamaran ferry was delivered to Catalina Express in ceremonies on Whidbey Island, Washington, on April 28.

The vessel, designed by International Catamarans Designs, Ltd., (Incat) Australia, was the 26th passenger catamaran built by Nichols Brothers Boat Builders, Inc., for U.S. service since the program began in 1983. Meanwhile, Nichols Brothers is building two other Incat catamarans for the San Francisco bay area. The company expects to deliver a 139-ft. (42.3 m), 400-passenger vessel to the Golden Gate Bridge, Highway and Transportation District in July and a 115-ft. (35 m), 315-passenger vessel to the Alameda/Oakland Ferry Service later this year. The vessel incorporates a "third bow," as well. This structure is installed forward between the double hulls to slice through head seas preventing waves from slapping the undersides of the boat. The main deck layout involves seats on the aft deck, a baggage compartment, airline style seats in the main cabin, and a refreshment bar. The upper deck provides seats on the open aft deck and some 79 seats in the first-class "Commodore Lounge." The upscale interior and bars were constructed by Arduous, Inc. and the seats by Beurteaux.

The "Jet Cat Express" is propelled by a four-engine arrangement of a type that is becoming popular in the larger twin hull configurations. Two Cummins KTA 50 diesel engines, developing 1,875 hp at 1,950 rpm, are mounted slightly offset in tandem in each hull. ZF BU 460 DHWL non-reversing marine gears, with a ratio of 1.689:1, are also offset. An engineered arrangement of carbon-fiber shafts and pedestal bearings carries power to four HM651 Hamilton water jets. Main engines were supplied through Cummins Northwest, which provided assistance in engineering the propulsion plant.

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Editor's Note

Marine business in these United States continues to get increasingly: A] Encouraging; B] Depressing; or C] Interesting, depending on who you talk to and at what time of day.

The entire market, from inland to oceangoing, naval to commercial, is abuzz with activity.

On the naval front, corporate intrigue has taken center stage as General Dynamics bids once again to acquire Newport News Shipbuilding. The major difference between the takeover attempt today versus the unsuccessful bid two years ago is the fact that Bill Fricks and the Newport News team is welcoming the offer, and all that remains is a thumbs up from shareholders and anti-trust concerns. Both parties, however, seem reasonably secure that the transaction will be completed in the third quarter, effectively creating a single source of nuclear submarine and aircraft construction in the U.S. General Dynamics, following the big defense consolidation surge, will dominate the U.S. shipbuilding market, owning four of the "Big Six" shipyards.

On the commercial side, attention is adequately split between Washington D.C. and the Gulf of Mexico. In the nation's capital, industry proponents are pushing for the re-installation of \$100 million in funding for the popular Title XI program, which had its funding cut by the new administration to next to nothing. In the Gulf, suppliers, builders and operators eagerly await the much-anticipated Offshore surge, which by all many accounts should start rolling strong by the end of 2001; beginning of 2002 latest.



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New Dimension for Hapag-Lloyd



by David Tinsley,
technical editor



The first of a new breed of 7,500-TEU containerships for Hapag-Lloyd. The new 100,000-dwt ships will stow 17 boxes abreast and will measure about 1,049 ft. (319.7 m) overall.

Although long in the vanguard of containership technology, Germany's Hapag-Lloyd did not feel compelled to join the early rush towards vessels of wider-than-Panamax gauge. Once the prudent Hamburg company decided to embrace the concept, however, it opted for one of the largest and most powerful embodiments of the post-Panamax genre to date.

Its planned commissioning this fall of the first of a new breed of 7,500-TEU linehaul carrier follows recent years' heavy investments in Panamax-optimized tonnage up to 4,890-TEU capacity, and signals a step change in unit scale economics applied to its Europe/Far East express service. The new behemoths will be of around 100,000-dwt and 80,000-gt, stowing 17 boxes abreast on the weatherdeck, within main dimensions of about 1,049 ft. (320 m) length, with a beam of 140 ft. (42.8 m) — the latter being more than 34 ft. (10.5 m) in excess of the Panama Canal limit. Although contract formalization only took place in March 2000, with steel

cutting implemented as recently as February this year, delivery of the lead vessel is projected for October 2001.

Hapag-Lloyd's selection of Hyundai Heavy Industries as its contractual partner said as much about the perceived capabilities of the South Korean major in meeting such tough lead time stipulations as it did about the yard's commercial competitiveness.

At a reported price of \$72 million apiece, relative to a high technical specification, largely unmatched slot capacity, and sustainable speed of 25-knots, there is no doubting the value to be obtained from the shipbuilding powerhouse on the Korean peninsula. HHI's ability to provide deliveries within 2000 for an entire, preceding series of seven 4,890-TEU vessels was a factor in the yard's favor when the German carrier came to consider the final shortlist for the 7,200-TEU newbuild project.

The fact that the detailed planning, which immediately preceded actual construction of the first ship at Ulsan took virtually as long as the build time pro-

grammed for the vessel was a measure of the drive to balance efficient production with the owner's specific needs in terms of final design detail and equipment outfit. As with all complex and protracted discussions, a shipowner is looking to optimal cargo stowage, ease of operation and a service life of at least 25 years, while a shipbuilder has for competitive reasons to maximize standardization and promote production throughput.

The main engine selected for the first of the new Hapag-Lloyd quartet will become the most powerful diesel at sea. A veritable 'cathedral' engine, the MAN B&W 12-cylinder K98MC is rated at 93,360-bhp (68,640 kW), providing the carrier not only with the raw power to make as much as 25.3-knots when 'full-and-down', where necessary, but also with the means of better ensuring year-round scheduling dependability through all the rigors of a deep-sea, long-haul trading environment. By adopting seven-cylinder versions of the K98MC series for its 4,890-TEU Panamax ships,

the German company laid down a basis for assimilating valuable operating experience with the super-wide-bore, two-stroke class prior to the service entry of the post-Panamax ships. In addition, the 7K98MC had yielded a space saving of four meters relative to an alternative engine of similar power, helping to take the Panamax category to a new slot capacity level.

Relative to Hapag-Lloyd's 7,500-TEU series, the 9,200-TEU concept design recently developed by Germanischer Lloyd, in anticipation of upcoming projects by liner companies in Europe and the Far East, has a broader beam of 151 ft. (46 m), slightly longer waterline length of around 1,083 ft. (330 m) and marginally shallower draft of 47 ft. (14.5 m). The latest S-class newbuilds for A. P. Møller's Maersk Line have an official capacity of 7,200-TEU, notwithstanding a length of 1,168 ft. (356 m), and width of 141 ft. (42.9 m), giving what is thought to be an enclosed volume equivalent to 91,000-gt and about 105,000-dwt at a draft of 48 ft. (14.5 m).

Cathedral Power

An RTA96C 12 cylinder

After a rash of containership design and propulsion system initiatives aimed at extending the reach of the most potent engines already in production, the industry has now been presented with a powering option offering an unprecedented output from a single-engine plant. Wärtsilä Corporation has indeed pushed back the bounds, breaking

with the traditional 12-cylinder limit on in-line diesel design, by proposing a 14-cylinder version of its largest two-stroke class.

The addition of a 14-cylinder option to its potent Sulzer RTA96C series has been given extra effect by a four percent across-the-board uprating, such that a single-engine solution can now be offered



Investment in Design

for power requirements up to a stunning 108,920-bhp (80,080-kW). The 19,280-bhp (14,200-kW) step-up in maximum unit output secured by the uprating in combination with the inclusion of a 14-cylinder model offers a 25-knot, single-engine, single-screw answer for vessels of up to 10,000-TEU. It also enables faster speeds to be engendered in existing sizes of post-Panamax container carrier, assuming that the space and weight penalties can be offset by the speed gains.

After all, increased power of the magnitude offered will necessarily mean higher engine weight and increased engine room length. Furthermore, there may be something of a psychological barrier to be crossed by shipping company engineers in adopting a 14-cylinder format of crosshead engine. But radical engineering steps are needed to secure the advances in linehaul vessel capacity demanded by shipping economics.

The industry's clear preference for single, diesel prime mover installations gives a pragmatic commercial basis to the Wartsila move, complementing the technical case. In fact, rival MAN B&W has conceptualized 13- to 18-cylinder in-line versions of its large-bore K98 engines, which could potentially cover the needs of a future generation of 25-knot vessels with stow capacities up to 18,000-TEU.

Experts believe that ship sizes between

10,000- and 12,000-TEU can be anticipated in future, although practical considerations seem to preclude an advance in the medium-term to drafts greater than 50 ft. (15.3 m).

As it stands, nowhere in Europe has the production capability for the 14-

cylinder Sulzer engine proposed by Wartsila. The Finnish power system supplier's largest factory, the former Grandi Motori Trieste plant in Italy, can build diesels up to the 8RTA84C size, of some 44,000-bhp. The RTA96C accordingly falls exclusively within the

province of Far Eastern licensees.

Hyundai, the world's most prolific marine diesel engine manufacturer, has recently taken a global lead by readying its global works to fabricate and test two-stroke engines in excess of 100,000-bhp.

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VT Chosen By The Royal Navy

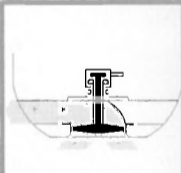
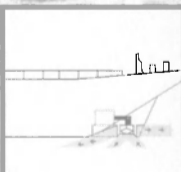


Vesper Thornycroft has won the competition to build a trio of Offshore Patrol Vessels in Southampton for the Royal Navy together with related logistic support.

The contract calls for the lease of three ships over an initial five-year period together with a full support package. The vessels will be used by the Royal Navy to replace existing ships involved with Fishery Protection Duties. The design has been especially prepared for the Royal Navy's requirement but will have export prospects in the growing Economic Exclusion Zone market.

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News

STN Atlas Lands \$2.5 Million Norwegian Contract

Bremen-based STN Atlas Elektronik has been awarded a contract worth \$2.5 million by the Norwegian National Coastal Administration for design and installation of new VTS facilities at

Kvitsoy in the southwest coastal region of the country. The VTS center itself will be equipped with a series of Atlas 9750 multi-media, dual-display operator workstations and associated processing equipment supported by secondary display terminals for database information as well as remote VHF and CCTV con-

trol. They collectively will provide continuous graphic presentations of all traffic situations, including overlays of radar images on electronic charts; additional functions include synchronized logging, recording and replay radar and voice communication.

Circle 9 on Reader Service Card

Robert Allan Collaborates With Washburn & Doughty

The first of a new class of high-performance tugs designed by Robert Allan of Vancouver, B.C. for Wilmington Tugs, will be built by Washburn & Doughty of East Boothbay, Maine. The new vessel will complement and expand Wilmington's advanced ship-handling services in the Delaware River region.

Designated as the ASD 25/55 Class, the vessels' design features a similar hull form to that of other Robert Allan designs. A partially raised forecastle and an elevated wheelhouse will ensure high visibility when the tug is called to handle large barges with high freeboard. While its primary use will be as a day-boat, the tug will house overnight crew accommodations.

It is expected that the tug's performance will be 52 tons (114,650 lbs.) bp, with a free-running speed of 12.5 knots.

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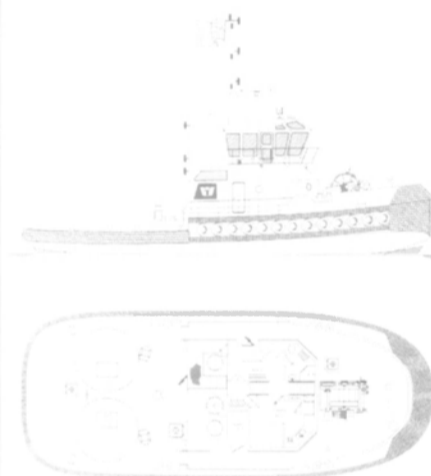
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Main Particulars

Length, (o.a.)	80 ft. (24.3 m)
Beam, molded	32 ft. (9.7 m)
Depth, molded	17 ft. (5.1 m)
Hull draft	9 ft. (2.7 m)
Maximum draft	13 ft. (3.9 m)
Main engines	Two Detroit Diesel 12V 4000
Z-drives	Rolls Royce/Ulstein

Dreggen Crane Receives 25-Crane Order

Dreggen Crane has been granted an order for 25 cranes worth \$3.3 million for several cable laying vessel projects around the world during the last few months. The company received an order from an Asian yard for 18 deck cranes — six of which will be supplied on 7,800-dwt cable laying vessels for a U.S. company — including options for four additional vessels.

For each vessel, Dreggen will deliver two telescopic boom pedestal cranes with a capacity of 10 tons at 82 ft. (25 m), in addition there is also a smaller stores crane with a capacity of two tons at 49 ft. (15 m) in each set.

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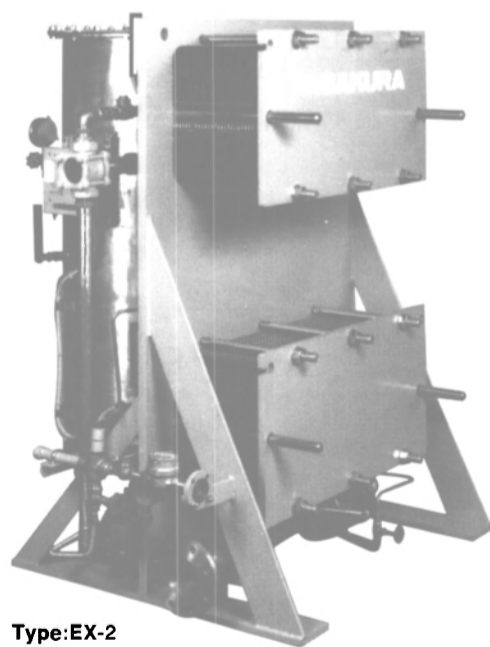
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Type:EX-2

World's shipyards taking next step in automation

Grit blasting soon to be a thing of the past

High-production robotic coatings removal is currently revolutionizing the world's shipyards. UltraStrip Systems has developed a state-of-the-art hydroblasting robotic system that is setting the standard for coatings removal. This exciting new system has the highest production rate in the world (approx. 200 square meters per hour). While ship owners are turning away from traditional grit blasting, shipyards are turning to hydroblasting.

Increased profitability and production

The direct operating costs of this new system is dramatically lower than what shipyards are currently paying. There is also a significant time savings. Not only is the time for the coatings removal process significantly reduced, but additional repair work can take place while the hydroblasting robot is at work. By permitting repair and maintenance work to occur concurrently with surface preparation, the robotic hydroblasting system effectively creates additional dry-docking capacity and additional shipping capacity for ship owners at no additional price. Simultaneous repair operations will increase productivity of their ships, while

shipyards can have the equivalent of new docking facilities without the need for substantial capital investment.

Here's how it works

The M2000 is comprised of three major component assemblies: the robotic vehicle, an ultra-high-pressure (UHP) pump and a vacuum/filtration system. The robot is controlled by an operator with a highly sensitive "joystick" device, allowing 360° movement and astounding responsiveness to ship curvatures. The pump supplies filtered water to the magnetically attached robotic vehicle which strips coatings and corrosion to the ship's clean steel substrate with a patented and proprietary method.

The vacuum/filtration system separates the contaminated water from the waste water and returns clean water back to the closed loop for environment.

Superior

With a salt removal rate 10 times faster than conventional methods, the M-2000 system extends the life of your ship.

M2000's closed loop system allows zero discharge to the environment

"You only have to take a walk around any ship repair facility today to see the mountains of used blast medium which are toxic and which are a major headache not only for the environmentalists, but also for the shipyards themselves. When you add to that the fact that the hulls of today's ocean going vessels are coated with tin based anti-fouling soon to be phased out, then unless some controlled, environmentally acceptable method of coatings removal is found, it will be an environmental disaster. I believe that the



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HHI Builds Twin Engine V-Max VLCC

Vision, a unique VLCC built by Korea's Hyundai Heavy Industries Co., Ltd. (HHI) in that it features twin-engines and twin-propellers, was recently christened at the Ulsan Shipyard. Concordia Maritime AB's new ultra-large 315,000-dwt VLCC was christened by Mrs. **Karen Fidler**, wife of the president of Sunoco Inc., the company that chartered the VLCC.

Built for Concordia Maritime, of the Stena organization, the VLCC is a revolutionary type of crude oil carrier. The 1,102 ft. (336 m) long Stena V-Max design VLCC differs from other large tankers built in the world to date.

In addition to double hulls, the VLCC has double, completely separate engine rooms, double rudders and double propellers. This twin-engine configuration gives the VLCC substantial advantages since one main engine can be shut down

for maintenance while the vessel continues its voyage with the other. But these double functions represent an extra safety feature, and provide the VLCC with maneuverability touted as far superior to that of other conventional VLCCs.

"This ship not only has unique double hull design features, but is also equipped with two separate engines in two completely separate engine rooms, two rudders and sets of steering gear, two propellers and duplicate control systems. The V-MAX is thus designed to overcome any single type of system failure — a yet unrivalled active safety capability which we consider just as important as the passive safety of a double hull," said **Lars Carlsson**, Concordia's managing director. "Statistically more than 30 percent of serious tanker accidents are caused by vessels losing control due to machinery and system failures. This risk is all but eliminated in the V-MAX.



Stena Vision ... The V-MAX Reality.

Using only one of its twin engines, the vessel can maneuver during a period of minimum 72 hours at a speed of at least six knots in a head sea and gale force winds of Beaufort force 8. This reserve of power makes it the first VLCC tanker to satisfy Det Norske Veritas' Redundant Propulsion Separate (RPS) requirements." In terms of maneuverability the V-MAX reportedly performs considerably better than a conventional modern tanker. At a maneuvering speed of eight knots, the vessel's turning circle is tighter than that of a Suezmax of half its

size. The new VLCC — with a service speed of 16.9 knots — also employs an exceptionally beamy, shallow-draft hull form. The vessel has a beam of 229.6 ft. (70 m), compared to the normal 190-197 ft. (58-60 m) one for VLCCs. These features make it possible for the VLCC to offer a 30 percent higher loading capacity on a limited draft than more conventional VLCCs. The second of the two-ship order is scheduled for delivery in June.

As navigation errors account for about a third of all tanker accidents, great

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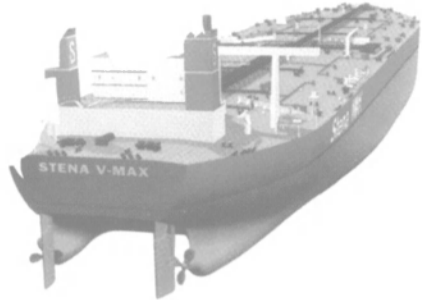
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The V-MAX Concept.

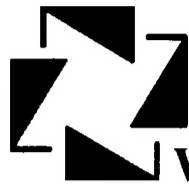
emphasis has been put on the arrangement, equipment and layout of the navigation bridge, as well as on the training of deck officers. For instance, the bridge provides a 360 degree window view from a centralized co-pilot conning station where all control and monitoring can be performed through the state-of-the-art Integrated Bridge Control System (IBCS). Training has been conducted in cooperation with local pilots using a full-scale bridge simulation model featuring the vessel's primary trading environment, the Delaware River.

Affectionately known as 'the Floating Volvo' — a nickname branded by Admiral **James Card** of the U.S. Coast Guard — the V-MAX has slow-speed main engines which satisfy the new IMO requirements for Nitrogen Oxide emissions and also have separate tanks for more environmentally friendly fuel for operation in sensitive areas calling for reduced emissions. She is prepared to be the first large tanker equipped with 'intelligent' engines (**MAN B&W 7S60 MC-C**) with enhanced combustion control, enabling fuel consumption or NOx emissions to be minimized in each speed range. Also lubrication oil consumption is significantly reduced. In the interests of long term corrosion resistance, the ballast tanks are double coated with epoxy totaling 300um, and the cargo tanks are coated from the tank bottom and one meter up and from the under deck and two meters down; including complete coating of the transverse web frame. Particular efforts have been made in meticulous preparation of the steel surfaces and climate control for ultimate paint adhesion. As a result, the ship has a life expectancy in excess of 30 years.

Particulars of the V-MAX:

Length, o.a.	1,092 ft. (333 m)
Length, b.p.	1,049 ft. (320 m)
Beam	229.6 ft. (70 m)
Depth (molded)	84 ft. (25.6 m)
Design draft	55.1 ft. (16.8 m)
Scantling draft	62.3 ft. (19 m)
Ballast draft	28.2 ft. (8.6 m)
Deadweight at design draft	268,000 mt
Deadweight at scantling draft	314,000 mt
Main engines (2 Sets)	MAN B&W 7S60 MC-C
Maximum output two engines	42,900 bhp
Design draft	16.9 knots
Scantling draft	16.3 knots
Ballast draft	17.7 knots

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New & Notable

IZAR Takes Lead In RoPax Market

IZAR, the new Spanish shipbuilding consortium formed with the combination of the former Astilleros Espanoles and Bazan, has delivered to Stena Line its brand new ferry Stena Hollandica,

which entered service in the Hook of Holland-Harwich route. In October 2000 Stena Line had already introduced its sister ship Stena Britannica.

Stena Hollandica was built at the

IZAR Puerto Real yard, as well as the Stena Britannica and the first and second in series, Finneagle and Finnclipper, operated by the Finnish owner Finnlines. IZAR Puerto Real yard has

became a world leader in the construction of RoRo and passenger ferries, as in the last three years it has delivered seven totaling an output over 225,000 gt. To solidify its position further in this high-value vessel niche, IZAR Puerto Real will cooperate with Stena Line in developing RoPax and train ferry projects.

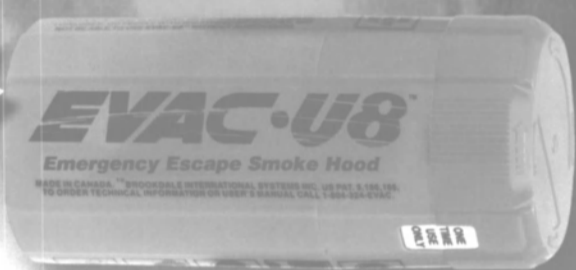
Stena Hollandica, Stena Britannica, Finneagle and Finnclipper are sister vessels based on the Seapacer design developed by Stena. According to Pim de Lange, Stena route director for the Hook of Holland-Harwich service, the two new ships are offering improved frequency and reliability. With a 22-knot cruising speed, the ship offers 452-passenger capacity with 192 cabins.

Innovative Cargo Access System

The vessels have a substantial cargo access system on the main deck aft, consisting of a stern ramp/door with a 64 ft. (19.5 m)-wide driveway that is capable of handling two lanes of traffic simultaneously. The 49 ft. (15m)-long ramp leads to a hull opening 66 ft. (20 m) x 17 ft. (5.2 m). At the bow there is an 61 ft. (18.5 m) ramp providing a 21 ft. (6.5 m) driveway into the 21 x 17 ft. (6.5 x 5.2m) forward hull opening. When closed, the inner part of the three-section ramp/door forms a watertight door at the collision bulkhead with the outer section folding behind the bow door. A second watertight door is located behind it. A pair of longitudinal bulkheads split the seven-lane main deck into three sections. Doors close off the two-lane port and starboard sections forward and aft. The arrangement of the longitudinal bulkheads on the main deck conforms to Solas 90+50 cm sub-division and stability rules. The doors are watertight at the base and sides when closed, and are stowed parallel to the deck in the open position. The ramp at the bow is partially hoistable, that part hinged to the cellar deck being 111 ft. (33.7 m) in length and 10 ft. (3.1m) wide. End-hinged water-tight covers close off both ramp apertures.

In the upper deck access, the series differs from similar designs, having a single hoistable ramp on the port side located just forward of midships. Trucks that traverse the 19 ft. (5.9 m) wide internal ramp have to make two 180 degree turns before leaving the ship via the bow ramp. The internal ramp can be lifted into its stowed position with a 240-ton load. Two 82 ft. (25 m)-diameter turning areas have been laid out fore and aft on the upper deck, sufficient for the longest articulated vehicles. Apart from the supports surrounding the access casing on the portside, the upper deck is entirely free from pillars and obstructions. A separate drivers' restaurant and lounge and a single business

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Norwegian Wind

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New & Notable

lounge are evidence of the anticipated dual use of the vessels. On deck eight, 87 two-berth cabins, 28 four-berth, two cabins for handicapped passengers, and two VIP cabins are provided, with a further 66 two-berth and six four-berth cabins on deck nine. A total of 25 crew cabins are located at the forward end of deck nine.

Big Capacity at High Speeds

Reflecting the trend toward higher-speed RoRo vessels, the sister vessels have a service speed of in excess of 20.5 knots and a trial speed of 22 knots at 90 percent MCR. The propulsion machinery is based on four main engines, each with an output of 5,760 kW (7,720 bhp) at 510 rpm. The combination of four

main engines and twin CP propellers was selected as the most flexible option. The engines drive the propellers through twin-input/single-output gearboxes with power take-offs for 1,600 kVA shaft alternators. Three 870 kW gensets, driven by auxiliary engines, provide sufficient electricity for use in port, and when the twin 1,200 kW bowthrusters

are in use. Together with the bowthrusters, a pair of flap rudders guarantee excellent maneuverability. The vessels are equipped with large surface-area fin stabilizers. An active anti-heeling system, which has a pump capacity of 3,000 tons/hr., is also installed.

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OOIL Orders Two Containerships For \$160M

Orient Overseas (International) said two of its subsidiaries have entered into a contract with Samsung Heavy Industries Co. to build two post-Panamax container vessels. The two post-Panamax container vessels are worth a total of \$160 million, which represent about 20.9 percent of OOIL's net tangible assets. Each can carry 7,400 teu.

ZNA's J.J. Marie Inducted Into French Legion of Honor

J.J. Marie, president and CEO of Zodiac of North America (ZNA), was inducted into French Legion of Honor, holding the title Chevalier de la Legion d'Honneur. He was presented with the award in January at a private ceremony in the residence of Francois Bujon de L'Estang, French ambassador to the U.S. in Washington, D.C. The Legion of Honor, which is considered France's highest honor, was created by Napoleon Bonaparte in 1802.

Marie began his career in the French Merchant Marine, followed by the French Navy. He became president of ZNA in 1990, after serving the company for 10 years. Marie is a high-profile advocate of boating safety and holds leadership positions at many boating safety organizations.

LMN Announces Promotions

Litton Marine Systems has announced the following promotions: **J. Nolasco DaCunha** as vice president and GM of the Commercial Sector; **Wayne Humphreys** as vice president and general manager of the Military Sector; and **Norman Addington** as vice president of operations. DaCunha assumes responsibility for marketing and sales, strategic business units and regional issues and activities worldwide for the Commercial Sector. Humphreys, formerly vice president, defense marketing, will have similar responsibility for marketing, sales, strategic business units and related regional issues and activities for the Military Sector.

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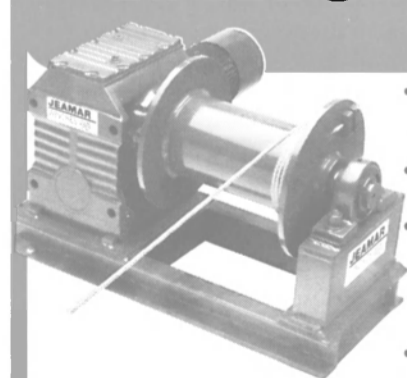
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SOLICITATION FOR COMPETITIVE SEALED BIDS

The New York City Department of Transportation (NYCDOT), Staten Island Ferry Division, is soliciting interest from qualified shipyards to submit bids for the Shipyard Construction of Three (3) New Ferry Vessels for the City of New York's Staten Island Ferry System.

Contract Number: PIN 84100SISI039

NYCDOT intends to construct three new ferry vessels for its service between Manhattan and Staten Island. The double ended ferries will be 310 ft. long, with a 70 ft. beam at main deck, a design draft of 13ft.-6 in. and a depth to main deck of 21 ft.-4 in. at centerline. The ferries will have conventional fixed-pitch propellers and a diesel electric power plant with three diesel generator units powering two electric propulsion motors at each end. The total in-service output is 6,000 SHP. The ferries will carry approximately 4,400 passengers on four decks and thirty vehicles. The displacement at design draft is 3,200 L.T.

It is also the intent of NYCDOT to take delivery of the 1st ferry 21 months after the notice to proceed, the 2nd ferry 26 months after the notice and the 3rd ferry 31 months after the notice.

Contract Documents may be picked up from the NYCDOT ACCO Office, Rm 824A, 40 Worth St, NY, NY, 9AM-3PM, Mon-Fri.

Submit your company's correct address, telephone and fax numbers when picking up contract documents.

Bid documents must be submitted by 11AM, Monday, June 18, 2001 to 40 Worth St, Rm 824A, NY, NY 10013.

Prospective bidders are **STRONGLY URGED** to attend a pre-bid conference convening at 10AM on Monday, May 21, 2001 at the NYCDOT's Battery Maritime Building (BMB), 4th Flr Conference Rm, NY, NY 10004.

For additional information contact: Raymond M. Takla, P.E., Project Mgr., 212/487-5694, at BMB, 4th Flr.



New York City
Rudolph W. Giuliani, Mayor

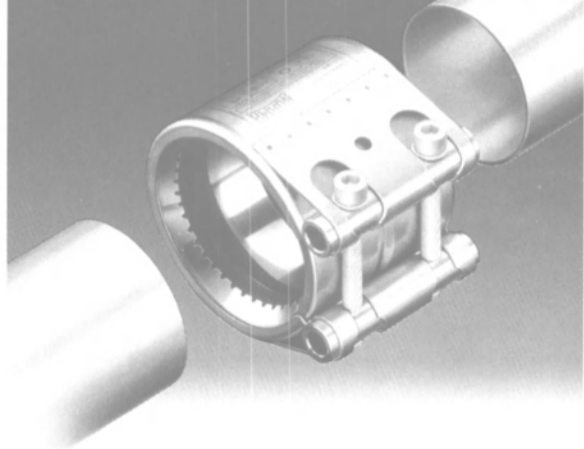


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Department of Transportation
Iris Weinstahl, Commissioner

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News

New ATB Joint Venture Is Formed

Richard Bludworth, CEO of Bludworth Marine LLC, and **John Cook** formerly with Odyssey Transportation, Inc. and Marine Specialty Company, have formed a new joint venture, Bludworth Cook Marine, to design and manufacture an updated pad style articulat-

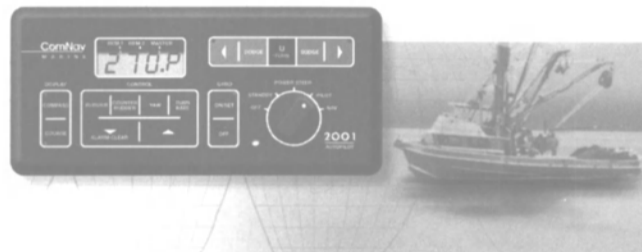
ed tug and barge connection (ATB) system providing new technology to an already proven concept.

The company principals, having been involved over the last 20 years with the design, fabrication and installation of most of the Bludworth style connection systems currently in service today, will provide an enhanced ATB connection system that will offer improved performance and reliability for economical

tug-barge retrofits or for newly constructed ATB units. The new company is also working on technical upgrades for existing systems and a second generation dual mode system that will address the requirements for offshore lightering, permitting the tug to remain positively connected to the barge during cargo operations at sea.

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Chevron Acquires Two Tankers

Chevron Shipping Co., LLC will acquire two, double-hull oil tankers from Mitsui & Co., Ltd. and Samsung Heavy Industries Co., Ltd., of Korea. The Aframax tankers will be built in Samsung's Koje Island yard and are expected to be delivered in 2003.

Chevron will charter the vessels, which Mitsui will own, for 10 years. This is the seventh boat built by Samsung for Chevron. When designing the tankers, Chevron intends to use high quality materials, accommodations and state-of-the-art safety equipment.

OMI Acquires Vessels

OMI Corporation has acquired a 35,000-dwt product carrier from Kulukundis Shipping Investments Inc. Built in 2000, the carrier is expected to arrive in April or May. OMI will issue 1,150,000 shares of its common stock to the seller at \$8 per share and pay the balance in cash. To the extent that the average of the closing prices for 120 trading days following registration is less than \$8 per share, OMI is obliged to pay the difference between \$8 and that average. If the stock closes at \$8 or above 30 days (10 consecutive) no amount is payable. The maximum additional payment is \$2.3 million.

Amer Reefer Files For Bankruptcy

Amer Reefer and its seven subsidiaries filed petitions in New York for reorganization under U.S. Bankruptcy Code chapter 11. The filing comes after six months of intensive negotiations between the company and its bondholders in respect of restructuring its 10.3 percent senior notes due 2008. In March, company advisors believed they had reached a commercial agreement, which was acceptable. However, the settlement was frustrated by the failure to agree on a settlement involving escrow funds.

Unauthorized Welding Caused Carnival Ecstasy Fire

Unauthorized welding on laundry room equipment triggered a fire aboard the cruise ship Ecstasy off Miami in 1998, injuring 22 people and causing more than \$17 million in damages, U.S. safety investigators concluded.

The National Transportation Safety Board (NTSB) said that sparks from the welding equipment caused a fire that quickly spread and ignited a large accumulation of lint in the laundry room ventilation ducts. The fire migrated through that system to the aft mooring deck where it fed on dock lines, generating such intense heat that it knocked out an electrical system that helped power the ship's engines.

Ecstasy, with 2,565 passengers and 916 crew, was left adrift several miles east of Miami before rescue crews put out the fire and towed the ship back to port. Sprinkler systems activated by heat and smoke prevented the fire from spreading to upper decks and other areas of the ship, the safety board found. However, the board concluded that the lack of a fire suppression system on the mooring deck enabled the fire to rage.

Investigators largely praised the crew for its handling of the emergency, but noted shortfalls in procedures for distributing life jackets and accounting for passengers during an emergency.

In its recommendations, the board said Carnival should change its procedures to prevent any unauthorized welding or work that could cause a fire and revise

information on safety procedures during emergencies. Crews working on the laundry equipment aboard the Ecstasy failed to obtain the necessary permit to do the work, investigators found.

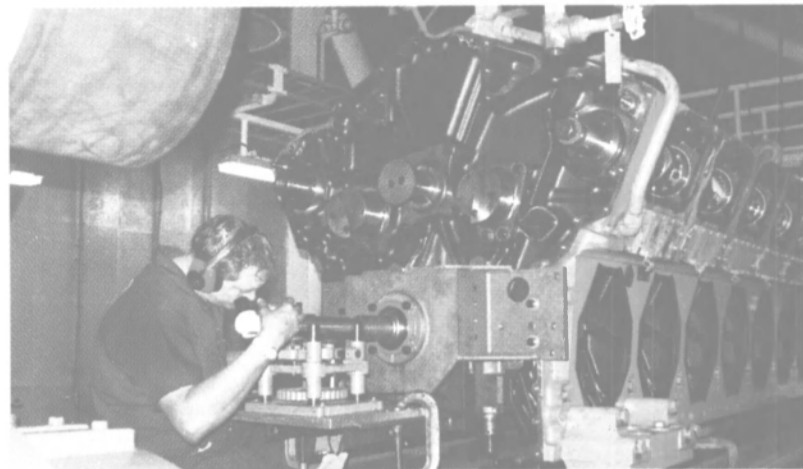
The board also recommended that the company inspect, and, if necessary, modify electrical circuits to ensure that a single failure could not disable a ship's propulsion system. They also recommended that the cruise ship industry should ensure that fire suppression systems were placed on the mooring decks if they carried equipment in that area of the ship that could burn, and suggested the ships should have emergency call systems in staterooms and crew cabins so people trapped during a fire could at least signal their location.

Litton Ingalls Lands \$196.5M Navy Contract

The U.S. Navy awarded Northrop Grumman Corp.'s Litton Ingalls Shipbuilding an additional contract worth \$196.5 million to its shipbuilding unit for work on an amphibious assault ship. Litton will continue work towards the construction of an eighth WASP (LHD 1) Class large-deck, multipurpose, amphibious assault ship. The contract includes options for later exercise by the Navy for building early ship assemblies and procuring additional material and equipment; options worth about \$82 million. The contract modification will be followed by additional incremental awards as remaining options are exercised during the calendar year.

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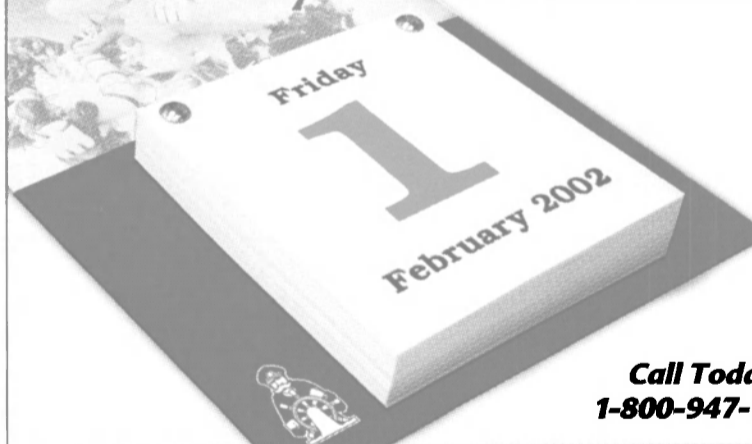
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Circle 247 on Reader Service Card

Castor's Downfall: Hyper-Accelerated Corrosion

Few marine incidents have vexed the collective international marine community as much as the recent situation with the damaged product tanker Castor, a ship, which experienced a near fatal deckplate crack in mid-voyage and then

was denied safe harbor for fear of the ship splitting open and spewing its gasoline cargo. Though the ship was eventually docked safely without environmental incident, the name Castor will serve as a lightning rod in the IMO to more

firmly establish rules and procedures for ships in distress at sea.

As the political wrangling and finger pointing start to subside, attention is now turned on the ship itself, and more accurately finding out the reason that an

assumed healthy ship developed a near fatal deckplate crack. Following an exhaustive inspection and analysis of the damaged product tanker Cas-



Frank Iarossi

tor, the Cyprus Department of Merchant Shipping and ABS have jointly announced preliminary findings that point to hyper-accelerated corrosion as the probable principal cause behind the structural failure.

"The Castor has become a floating laboratory, which is providing us with some surprising findings," said ABS chairman and CEO **Frank J. Iarossi**. "If these initial conclusions hold up, there will be significant implications for class and possibly wider implications for the manner in which the new generation of double hulled tankers should be constructed and maintained."

A formal report into the casualty will not be issued by the Cypriot authorities and by ABS until the conclusion of detailed laboratory testing of steel samples cut from the damaged section of the tanker. "It will take some time to scientifically verify that our interpretation of events is correct," said Iarossi.

"The Castor represents an unprecedented level of cooperation between the class society and the Flag State involved in a casualty," said Captain **Andreas Constantinou**, senior marine surveyor for the Cyprus Department of Merchant Shipping.

The 600 tons of steel, primarily in the deck plating and underdeck longitudinals, that was renewed on the Castor at Special Survey in late 1997 has provided the key to understanding what tran-

The underdeck and remains of an underdeck longitudinal in the affected section. You can see the original coating and where there has been coating breakdown. The longitudinal shown had the flange replaced at the last special survey in 1997. This was welded to a web that, at that time met class requirements and had wasted less than 18 percent from its original 15mm dimension. What has happened in the interim is that the adjacent deck coating and the new steel on the flange were both more resistant to corrosion than the partly wasted web. The galvanic action attacked the weakest component, the web, which became the sacrificial anode. Obviously it did not waste to zero but it did waste sufficiently to be unable to sustain the buckling load and fractured. The deformed but intact web is an indication of the residual strength that remained in the structure.



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spired in the interim. "Our gaugings indicate that sections of this steel have already wasted by as much as 30 percent," said Iarossi. "This indicates an annual corrosion rate of as much as 1.5 mm compared to normal rates of about 0.1 mm or less." The critical element, according to the preliminary findings, is the presence, and absence of coatings. "The original steel had been coated,"

explained ABS chief surveyor **Gus Bourneuf**. "This coating had begun to break down with age. At the fourth special survey, the new steel was not coated. There were no sacrificial anodes in the tanks so the uncoated steel in the underdeck area acted as the anode with the partially corroded, original steel providing the principal point of attack."

According to an independent corro-

sion expert brought in by ABS to analyze the condition of the ship, three other elements are considered likely to have contributed to the rapid deterioration. The vessel had been engaged in the gasoline trades, the most corrosive of all oil products. The critical no. 4 tanks were used for ballast purposes, introducing salt water into the chemical equation. And the vessel had been trading

into hot areas, such as West Africa, greatly raising the ambient temperatures in the ullage spaces and creating a fertile environment for the corrosive action.

"Given the scantlings applicable to this size of ship, the loss of nearly 5 mm of the new steel in just over three years of trading represents a very high percentage loss of section," said Bourneuf. "The loss of section of the uncoated steel that was not replaced was clearly greater. It is reasonable to conclude that this loss of strength in this critical area of the vessel may have contributed to the buckling, and subsequent cracking of the deck plating in the severe weather conditions encountered on passage." Iarossi stressed that the focus of the ongoing investigation will be on necessary remedial steps that need to be taken by ABS, recommended to IACS and, if necessary, proposed at IMO. "Once we have definitive conclusions to the investigations, Cyprus will raise the need for any changes in IMO requirements at the governmental level," Constantinou confirmed.

"It must be remembered that the Castor had met all class requirements when the major steel replacement was completed, and had remained in class with no outstanding," said Iarossi. "We have always felt that the Rules are sufficiently conservative for any operational environment. Although it must be emphasized that the Castor was structurally sound, it did not sink, it did not lose any cargo or cause any pollution, and no one was injured or lost their life, if there are shortcomings in the requirements we need to rectify that, and do so quickly." Castor is a steel single hull product carrier vessel with a gross tonnage of 18,565 and a deadweight of 31,068 metric tons, built at the Busan shipyard of the Korea Shipbuilding & Engineering Corporation. The ship suffered heavy weather damage while on passage from Romania to Nigeria on December 30, 2000. It was denied a sheltered area to tranship the cargo of 29,500 tons of unleaded gasoline by seven coastal states in the Mediterranean area. The vessel is currently undergoing inspection and repair in Piraeus.

This picture is taken looking up at the underside of the deck plating with the edges of the longitudinals visible on either side. The longitudinals were not replaced in 1997 but the deck plating was. The photo demonstrates the level of corrosion that has been sustained by the deck plate in just over three years. It also clearly shows the crack and the weld. As you will see, the crack did not follow the weld but rather the path of least resistance (i.e.) through the corroded plate.

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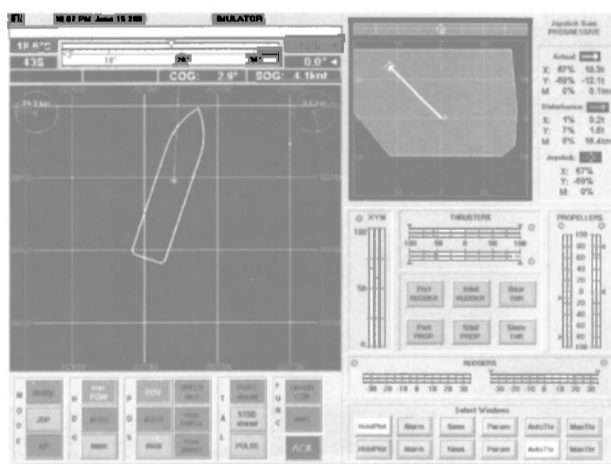
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The American Group announces name change:



The American Group was created by the merger of Samson Ocean Systems, American Manufacturing and Herzog Rope in 1993 and the subsequent acquisition of First Washington Net Factory in 1999. From this merger was born one of the largest rope and cordage manufacturers in the Northern Hemisphere. In total, The American Group represents well over 300 years of rope making experience.

Each company can lay claim to innovations that set new industry standards. By joining the pacesetters of the last century and maximizing the strengths of each, one company was created with a common mission: leadership in rope technology into the next century.

To better reflect our common mission, and the strength of our combined histories, The American Group has been renamed. The new corporate name, Samson Rope Technologies, draws upon our combined past while reflecting our mission for the future. The Samson name, along with the trademark of Samson and the Lion is the oldest continuously registered trademark in the United States. It is a great symbol to represent the combined strength and performance of our product line. It also symbolizes strength over time; longevity which can only be achieved through commitment to continuous development and the creation of new fiber combinations and constructions to provide greater strength, safety and security.



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1876-1884:

Samson trademark is registered to the J P Tolman Company.

1888:

Tolman incorporates Samson Cordage Works.

1889:

American Manufacturing Company Founded.

1948:

AMCO Introduces synthetic 3-strand nylon ropes.

1952:

Herzog Rope founded in Canada. Specialize in ropes for the Northwest fishery.

1955:

First Washington Net Factory established. First company to produce nylon knotted netting to fishing industry.

AMCO Introduces the first 3-strand polypropylene in the US.

1961:

Samson introduced the first all synthetic fiber double braided rope.

1972:

Samson Nystron is the first synthetic fiber rope used to moor an oil tanker to a loading buoy in the North Sea.

1989:

Herzog develops Permafex leadline for the seine fishery.

1992:

AMCO perfects coextrusion and produces Ultra Blue fiber, 30% stronger and 3 times more abrasion resistant than polypropylene.

1993:

The American Group is formed by merging AMCO, Herzog and Samson Ocean Systems.

2001:

Samson Rope Technologies is the banner that unites four illustrious cordage industry innovators under one name and one mission: Leadership in rope technology.



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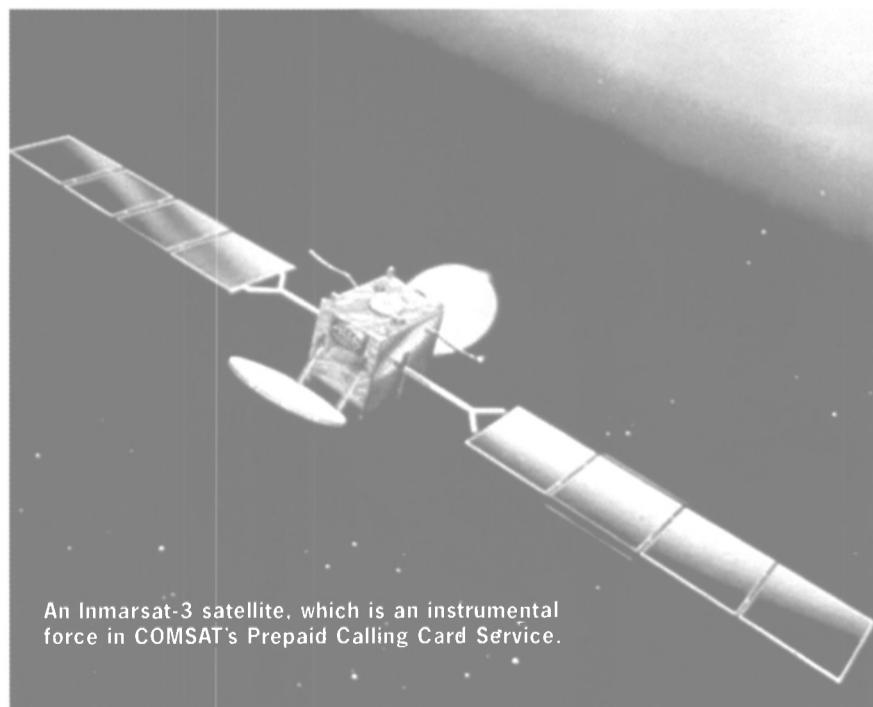
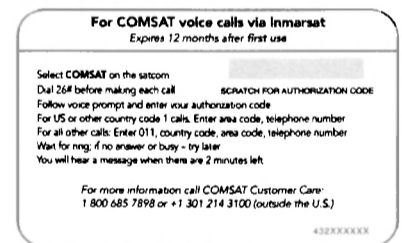
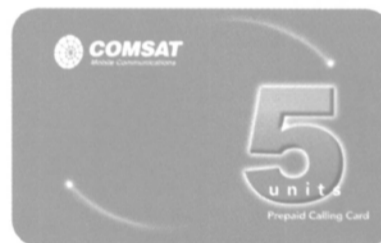
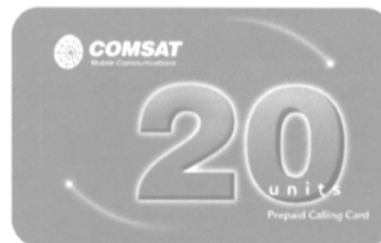
'CMC developed this new service to meet our customers' growing demand for prepaid services in the maritime, aeronautical and land

mobile markets," said Kathryn Y. Holman, vice president and general manager of COMSAT Mobile Communications. "Prepaid calling allows customers to manage their communications costs and stay within budget. It also eliminates burdensome tracking of crew and personal calls, making a single satellite terminal accessible to multiple users."

The new system is installed in CMC's Southbury, Conn., land earth station and is administered by CMC technicians and customer service specialists. This reduces operational costs and the savings are passed onto CMC prepaid calling customers.

Each CMC prepaid calling card comes with a unique six-digit authorization code on the back of the card. The dialing process has been streamlined, so users follow just two quick and easy steps to place a call.

The new prepaid service is also designed to make satellite calling easier. It incorporates enhanced calling features that include call continuation, card recharging and simplified dialing. Call continuation is a convenient feature that allows a caller to



An Inmarsat-3 satellite, which is an instrumental force in COMSAT's Prepaid Calling Card Service.

Pay-as-you-go with COMSAT Mobile's prepaid calling card, which boasts a variety of uses, including an easy, streamlined dialing process that requires just two steps.

continue a call from one prepaid card to another. A caller will receive a warning when one minute of call time remains. The caller can then enter a new six-digit authorization number for a new card and continue the call. Customers can also recharge their CMC calling cards for any amount. To recharge a calling card, customers need only to have either a major credit card or CMC account.

Developed for multi-industry use, the card is being touted as a morale booster or reward for those who work in remote locations, where regular telephone service is not readily available. The card is also ideal for those in the armed forces, who are stationed on the high seas, as well as to employees involved in the offshore and gas exploration industry, who are work-

ing on remote offshore rigs.

An added bonus to employers is that the card is available on a pay-as-you-go basis, making it a cost-effective option that doesn't demand a large up-front investment. This is especially conducive if a large amount of cards, such as 200 are ordered, as the employer will not owe anything until one of the cards is activated.

For more information on COMSAT Mobile's new Prepaid Calling Card Service, contact CMC at tel: (800) 685-7898 (U.S.); (301) 214-3100 (worldwide), or by e-mail: cmc-sales@comsat.com

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Good Vibes Surround General Dynamics, NNS \$2.6B Deal

In a move that could possibly trigger the final slowdown in naval shipbuilding corporate asset consolidation, General Dynamics late last month made a \$2.6 billion (a total which includes nearly

\$500 million of current debt takeover) bid to buy Newport News Shipbuilding. The move — while hardly a shock to defense insiders who have witnessed the proliferation of fewer, larger corporate

entities serving the military markets — in essence provides the Pentagon a one-stop shop for the purchase of nuclear submarines and nuclear aircraft carriers. Just two years ago a similar attempt by

General Dynamics was thwarted, largely because the bid in 1999 was hostile in nature and because of concerns regarding a monopoly of nuclear newbuilding capability. Less than 24 months later, however, the picture has changed rather drastically.

First, and perhaps foremost, the demand for nuclear powered submarines is dwindling, and with only one customer to serve — the U.S. Navy — quite frankly there is not enough business to go around. "This deal is no loss for competition, because there is no competition (between the two shipyards,)" said **William Fricks**, chairman and chief executive of Newport News. According to **Nicholas D. Chabraja**,

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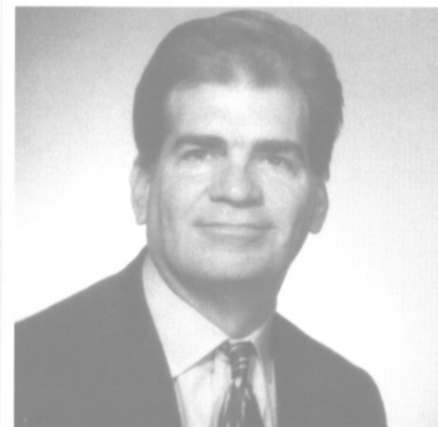
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William Fricks, NNS

General Dynamics chairman and CEO, the two yards have not effectively competed against each other since 1991. For the past three years, in fact, the two have been cooperating in the joint building of the Virginia class submarines, a factor of familiarization that has helped to bring the newly proposed merger to fruition. "Our businesses are complementary, as opposed to competitive," said Chabraja. "These companies cry out to merge together. It's a natural phenomenon and a logical next step."

Another positive sign for the deal: the current offer is actually welcomed by NNS. "This acquisition will provide Newport News shareholders an attractive price, and our employees will benefit from being part of a larger, more diverse company," said Fricks.

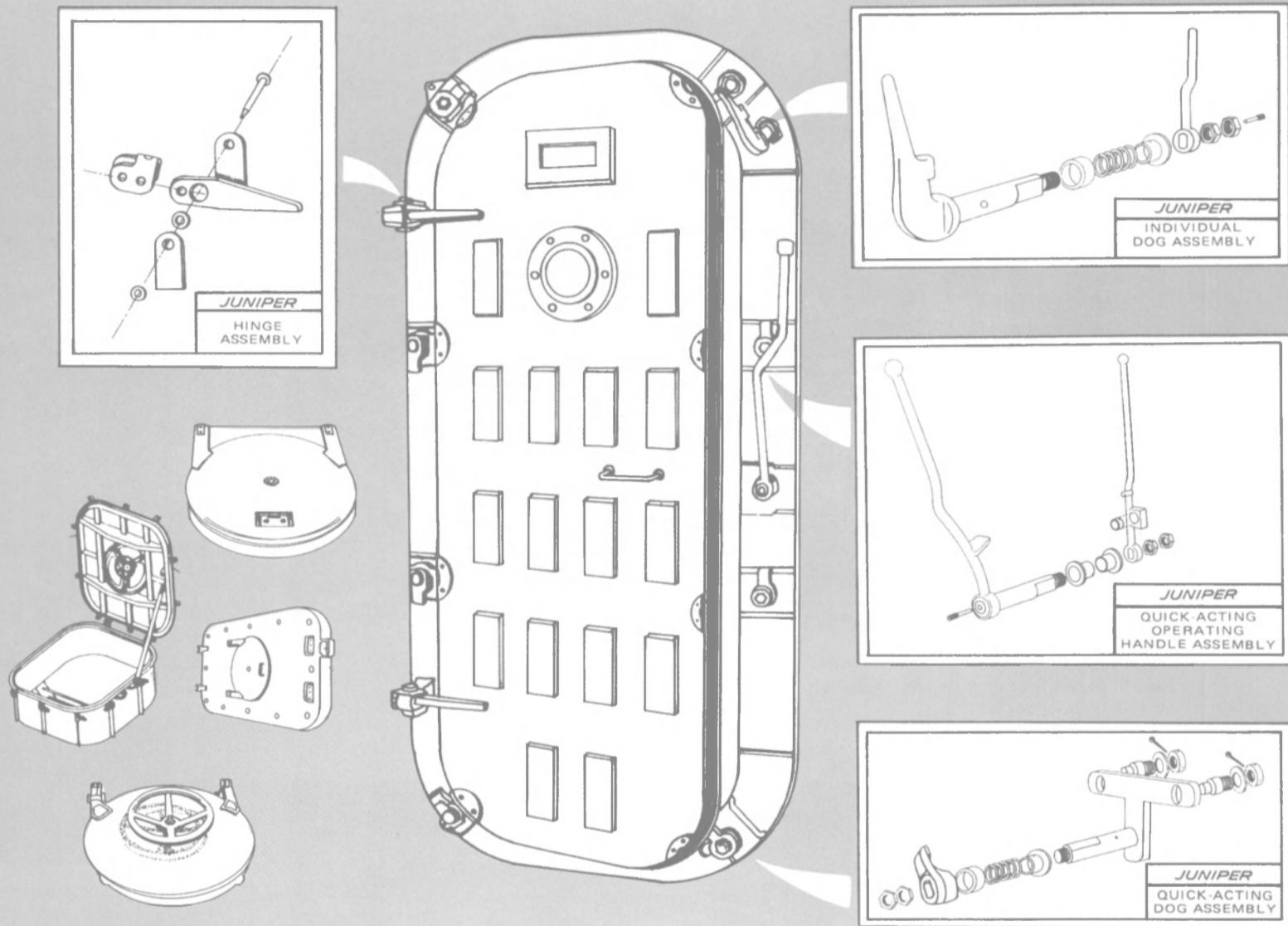
In addition, the Bush administration is widely regarded to be more favorable to such consolidations, much more so than former president Clinton.

The deal would also not be setting precedent, General Dynamics' bid follows Northrop Grumman Corp.'s \$3.8 billion purchase last year of shipbuilder Litton Industries. Finally, the merger now has the support of U.S. Sen. **John**

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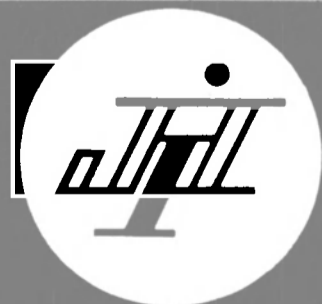
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Naval Report

Warner, chairman of the Senate Armed Services Committee. The Virginia Republican was a strong opponent of a General Dynamics-Newport News combination in 1999.

"Newport News is a solid, well-run company with sustainable revenues and

earnings and strong cash flow. Our offer reflects its inherent worth, offers Newport News shareholders an attractive premium, and provides a wonderful opportunity to save significant amounts of money for the U.S. Navy while retaining both nuclear shipyards," said

Chabraja.

Chabraja would not set a target on total cost reductions from the deal. He stressed that there were no plans to close shipyards or reduce staff, which tempers labor concerns in Virginia, the home state of both companies. In, as Fricks

pointed out, the recent review of the Navy business expressed a specific need for two nuclear-capable yards in the U.S.

General Dynamics, headquartered in Falls Church, Va., employs approximately 46,000 people worldwide and anticipates 2001 sales of approximately \$11.5 billion. The company has leading market positions in business aviation, information systems, shipbuilding and marine systems, and land and amphibious combat systems. It currently owns three of the "Big Six" U.S. shipyards, Bath Iron Works, General Dynamics-Electric Boat, and NASSCO.

Newport News Shipbuilding, headquartered in Newport News, Virginia, designs and constructs nuclear-powered aircraft carriers and submarines for the U.S. Navy and provides life-cycle services for ships in the Navy fleet. The company employs approximately 17,000 employees and had 2000 revenues of \$2.07 billion, and net income of \$90 million.

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The merger of General Dynamics with Newport News would effectively create one company in the U.S. with the capability to build nuclear aircraft carriers (such as the John C. Stennis, CVN-74, pictured at builder's trials); and nuclear submarines, such as SSN 766 Charlotte, pictured on sea trials. Both companies maintain, however, that they have not been directly competitive since 1991.

NNS 1Q EPS Up 19%

Newport News Shipbuilding reported net earnings of \$24 million, or \$0.75 per diluted share, for the first quarter of 2001. Earnings before interest and taxes (EBIT) for the quarter were \$51 million, up from \$47 million last year. "We are pleased to start 2001 with a continuation of our very strong financial track record," commented Chairman and CEO **William P. Fricks**. "Performance gains across our major programs have resulted in revenues and earnings that exceeded our earlier estimates. As a result, we are increasing our 2001 EPS estimates by 10 percent over prior guidance of between \$3.05 and \$3.10 before any transaction related expenses associated with the proposed acquisition of Newport News by General Dynamics Corporation." Newport News posted first quarter revenues of \$485 million, up from \$469 million in the first quarter of 2000. The favorable revenue comparison was driven by strong gains in the Construction segment. "First quarter 2001 Construction revenues advanced

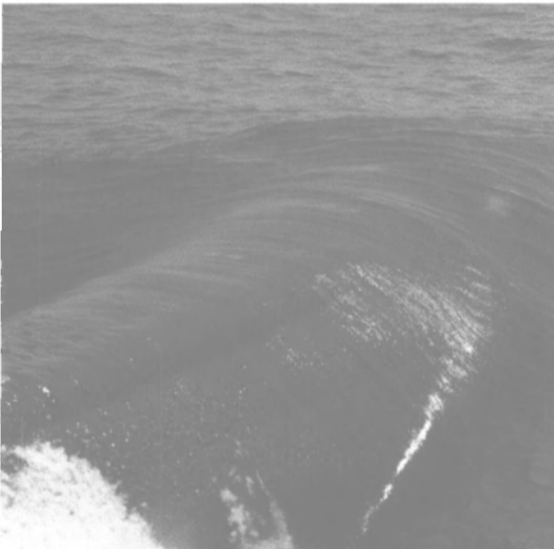
ment." Fleet Services revenues of \$185 million decreased slightly as the Nimitz refueling and overhaul approaches its mid-2001 delivery date. "Revenues will start to trend upward in Fleet Services later in the year as we begin the refueling and overhaul of the carrier Eisenhower," noted Fricks. "Our Engineering segment's revenues of \$67 million were

consistent with the prior year's quarter."

Newport News' backlog increased to \$6.9 billion at the end of the first quarter with the \$3.8 billion contract award for CVN 77 in January 2001. The company expects another significant addition to the backlog during the second quarter with the signing of the Eisenhower refueling and overhaul contract.

Moody's To Review General Dynamics Debt Rating

Moody's Investors Service placed the debt ratings of General Dynamics Corporation (GD) under review for possible downgrade and the debt ratings of Newport News Shipbuilding Inc. (NNS) under review for possible upgrade fol-



12 percent compared to the first quarter of 2000," said Fricks. "Increased volume on the Virginia-class submarine program coupled with the build-up on the new CVN 77 carrier construction contract drove the growth in this seg-



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Naval Report

lowing the announcement of a definitive agreement for GD to acquire NNS in a cash tender offer for all NNS's outstanding shares. The transaction is valued at approximately \$2.6 billion, including approximately \$500 million of existing NNS's debt. GD, continuing the consolidation process of the defense sector, plans to acquire NNS in a transaction

that will combine its Navy shipbuilding and submarine business with the submarine and aircraft carrier businesses of NNS. This transaction would make GD the sole supplier of submarines and aircraft carriers for the U.S. Navy.

Moody's review will focus on the strategic benefits of this transaction for GD as well as on the potential synergies

of combining the shipyard operations of the two companies. These potential synergies will be considered in the context of any limitations or requirements that may be imposed by regulators or the DOD as part of the approval process for the transaction. In its review, Moody's will also consider the challenges which GD may face in integrating NNS into its

operations, and the company's ability to avoid the difficulties that have occurred in other recent business combinations in the aerospace/defense sector.

Navy Honors Propeller Expert

Senior naval officers and government officials will recognize the career of Dr. **William B. Morgan** in a naming ceremony April 27 at the U.S. Navy's Large Cavitation Channel (LCC). This unique engineering test facility will bear the name of the former head of the Naval Surface Warfare Center, Carderock Division's Hydromechanics Directorate who retired in December after 50 years of service to the nation. The facility will be known as the William B. Morgan Large Cavitation Channel.

The ceremony takes place 10 years after the April 1991 dedication of the facility. Since that time, the LCC has provided almost 6,000 hours of advanced hydrodynamic and hydroacoustic testing. U.S. Navy test programs supported include the latest naval ship designs such as the Virginia and Seawolf Class submarine and Arleigh Burke Class destroyer. The LCC has also supported basic research programs with universities such as Mississippi State, University of Michigan, California Institute of Technology and Johns Hopkins University.

The LCC is the largest and most technically advanced, pressurized, closed-loop, recirculating water tunnel in the world. The hydrodynamic and hydroacoustic test facility supports advanced ship research and design testing as well as basic research. The buildings and land were originally part of a commercial installation on President's Island. After several years of leasing during the construction and start-up phase, the Navy purchased the site in 1994.

U.S. Navy Commissions Latest Aegis Destroyer

The U.S. Navy commissioned the USS Lassen (DDG 82), the newest in a series of Aegis guided missile destroyers built by Litton Ingalls Shipbuilding, a subsidiary of Northrop Grumman Corporation. Measuring 509.5 ft. (155.2 m) and 9,300 tons, USS Lassen, which is the 32nd ship of 58 Arleigh Burke (DDG 51) Class destroyers currently authorized by Congress — is the 14th to be built by Ingalls. Following DDG 82, Ingalls has contracts and options to produce 11 additional Aegis destroyers, with six of those ships in various stages of production. Upon USS Lassen's departure from Tampa, the vessel will be homeported in San Diego as an element of Destroyer Squadron 23, headed by Cmdr. **Sean E. O'Connor**, USN.

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L-3 Communications Delivers Premiere Production HVR

L-3 Communications' Aviation Recorder Division has delivered its first production Hardened Voyage Recorder (HVR) to Consilium Navigation — a manufacturer of high technology equipment for the maritime industry.

In joining forces with Consilium, L-3 Communications' HVR is scheduled to be installed on the world's largest cruise ferry, Ulysses, which is owned and operated by Irish Ferries, on May 3. The installation marks the first active deployment of L-3's HVR.



Modeled on technologies present in L-3's product line of Cockpit Voice Recorders (CVRs) and Flight Data Recorders (FDRs) for commercial and military aircraft, L-3's HVR records voice, radar, radio and shipboard performance data on solid-state memory housed in a crash-protected capsule.

The capsule, which is designed to withstand the harsh environments of ocean going ships, including those environments associated with an accident such as impact, deep-sea pressure and fire, is housed with an underwater locator beacon, the HVR can be easily located if deep-sea immersion should occur.

L-3 developed its HVR in response to increased interest within the maritime community to improve safety at sea. In recognition of this concern/interest, the IMO passed regulations, which will require RoRo ferries, passenger ships and large cargo vessels to be outfitted with crash survivable recorders.

L-3's HVR meets and exceeds all of the specifications for crash survivable recorders contained in the IMO regulations.

"This initial delivery represents the beginning of a global initiative to increase the safety of ocean going vessels. Aviation Recorders has developed key partnerships with the leading Voyage Data Recorder (VDR suppliers)," said **Bruce Coffey**, president of L-3 Communications' Aviation Recorders.

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WWII Epic "Pearl Harbor" Hits Theatres This Month

Premiering on Friday, May 25, 2001, Touchstone Pictures and Jerry Bruckheimer Films', "Pearl Harbor" focuses on the life-changing events that occurred on December, 7, 1941. Headlined by a cast featuring **Ben Affleck** and **Cuba Gooding, Jr.**, the film boasts myriad of wartime action.



Capsizing of the USS Oklahoma
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New "Ax-Bow" To Increase Ships' Efficiency

Considerable effort, particularly following the oil embargo of the 1970s, has been placed on reducing the fuel oil consumption of ships, a task readily handled by a series of improvements in hull

shapes, the fitting of energy savings devices, and improvements to the performance of main engines. A group of engineers from the Tsu Research Laboratories — **Koichiro Matsumoto,**

Kazuyoshi Hirota and Kenji Takagishi - however, noted that while performance in still water was gaining, other factors, namely wave resistance was taking its toll. Thus a study was launched to

develop new ship shapes in order to reduce the resistance increase due to waves, in order to lower sea margin.

NKK Corp. has developed the ax-shaped bow that allows a reported 20 to 30 percent reduction in ships' sea margin compared with conventional bows. The company will fit the new bow to a 172,000-dwt Capesize bulk carrier that is currently under construction at the yard's Tsu Works, being built for Mitsui OSK Lines. As ship operators increasingly demand more efficient operation, particularly under rough conditions, NKK decided to focus on how to reduce a ship's resistance on the bow above the still water surface. In 1996, teaming with Osaka University marine engineering researchers, the company developed a sharp-edged bow, which proved effective cutting through waves and reducing sea margin.

NKK has continued model tests of the Ax-Bow with partial funding from the Ship & Ocean Foundation, and con-

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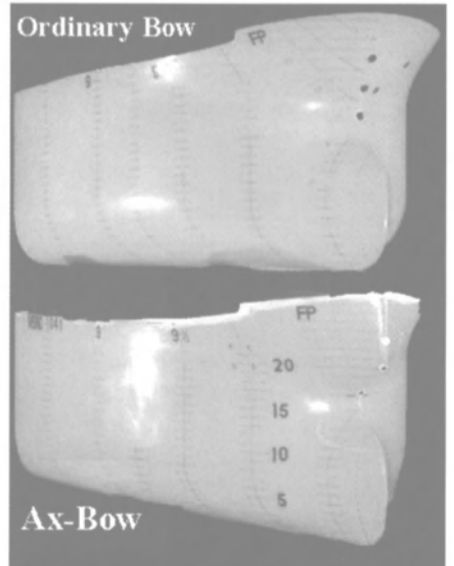
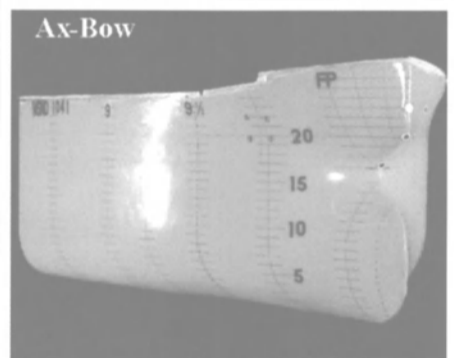
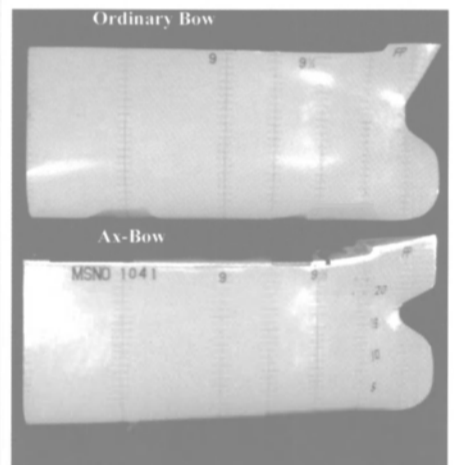
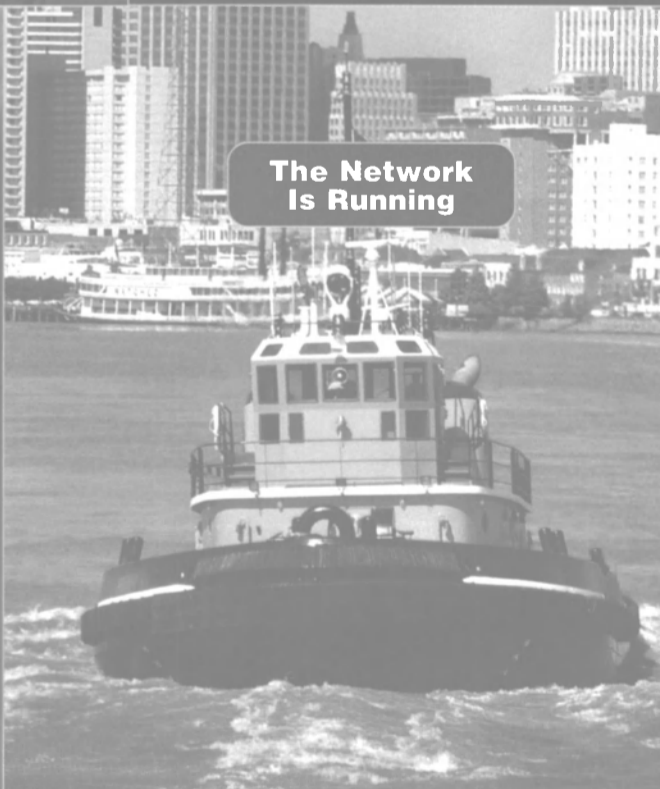


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firmed that the Ax-Bow can reduce a ship's sea margin by 20 to 30 percent. The bulk carrier is to be delivered in June 2001.

The team found that, in order to decrease the diffraction of waves at the bow, it is necessary to reduce the bluntness of the bow shape, especially above the still waterline. To design the opti-

mum bow shape under various practical restrictions, an estimation method of added resistance due to wave considering hull shape above the waterline is needed.

One solution formulated was the Beak-Bow, so named for its similarity to the appearance of a bird's beak. It entailed a sharp and extended triangular

shaped bow above the waterline, which served to effectively reduce wave resistance.

From a practical standpoint, however, it in some cases added too much length to the ship. For example, in the case of a 170,000-dwt bulk carrier, the ship length became 984 ft. (300 m) with the Beak-Bow, which made the ship, by reg-

ulation for its size/type, 36 ft. (11 m) too long to enter a European port. The shape was then modified to form the Ax-Bow, a bow shaped modified to shape the waterline as sharp as possible, keeping the profile of the bow as a solid line. It also, by nature of its shorter profile, helps to ensure that ships stay within length regulations.



Ro-Clean Desmi Sets World Record For Largest Oil Containment Boom

Ro-Clean Desmi A/S of Denmark has been officially awarded the Guinness World Record for developing the largest offshore oil containment boom in the world. Known as the RO-BOOM 3500 this boom has an overall height of 11.5 ft. (3.5 m). Traditionally offshore booms have only been around 6.5 ft. (2 m) in height.

This unusually large boom was developed for use in the Norwegian sector of the North Sea in Europe where the sea conditions are especially harsh with waves reaching up to 23 ft. (7 m). RO-BOOM 3500 has an overall deflated width of 3.5 m, an operational freeboard of 4 ft. (1.3 m) and a draft of 5 ft. (1.5 m).

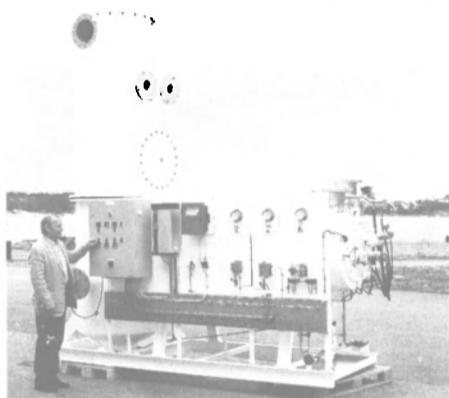
The operational performance of this boom was tested extensively in the North Sea more than three years, and the oil retention abilities were confirmed with underwater cameras.

A typical system comprises of 1,312 ft. (400 m) of RO-BOOM 3500 wound onto a specially developed hydraulic reel that can store, deploy and recover this massive boom. The boom is inflated using an ultra high capacity air blower. The system is completed with a specially designed set of towing equipment that includes a transverse bridle for the formation a skimmer pocket.

RO-BOOM 3500 oil containment boom is manufactured from heavy-duty neoprene rubber with a Hypalon external skin. This unique one-piece molded composite construction has complete cross vulcanization of rubber and reinforcing fabrics. The construction has high abrasion resistance, peel resistance and tensile strength. RO-BOOM lies completely flat when deflated allowing for easy cleaning and storage. The individual air chambers provide high integrity. RO-BOOM is fitted with stainless steel fittings and a hot galvanized ballast/tension chain. Stainless steel hinge connectors are fitted as standard.

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Gas Generation Systems



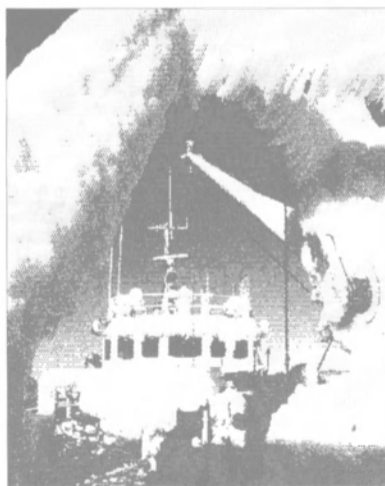
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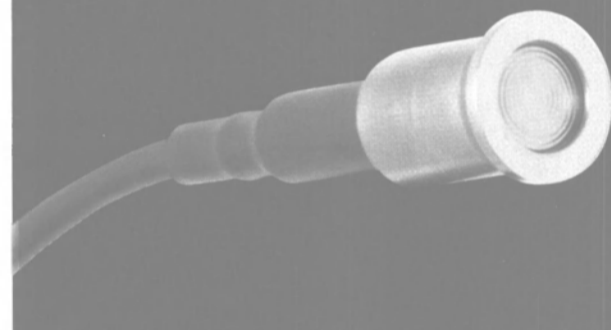
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Shipyards and marine and offshore fabrication facilities across North America are being offered a new way to fill their design and drafting requirements. Genoa Design International Ltd. has

launched a unique web-based system that facilitates the delivery of detail design and drafting services through the Internet.

From its base in Newfoundland, Canada,

Genoa Design manages projects through a combination of traditional and on-line technologies. Detail design, drafting and 3-D modeling work is done by in-house designers and engineering technologists using industry-standard computer applications. Project management is handled through the Design



Information Control System, Genoa's copyrighted Internet software.

Genoa Design's system simulates on-site design teams while reducing costs for clients. Using the system, clients can view work in progress and supply technical feedback in a secure online environment.

"For most of our potential clients, production and detail design requirements fluctuate," explained Genoa Design's president, **Leonard Pecore**. "We're offering them an economical and stable solution to meet their changing needs. They can get their work done right away with the added convenience of being able to virtually look over our shoulders at their work in progress, 24 hours a day."

One of the challenges that Genoa faced in developing an online system was ensuring that clients would feel comfortable working with a remote office.

"This kind of connectivity is new in our field," Pecore said. "Basically, we've set our operation up to ensure that we're as convenient as having a person work across the hallway. With the resources we have, we can jump right into a project with minimal preparation outside the norm. Another great advantage of the system is not having to worry about geographic boundaries."

Genoa Design has been serving the marine and offshore sectors since 1995. To learn more about the company and its Design Information Control System, visit the company's web site at www.genoadesign.com.

Reintjes IPP System Rewarded With Orders

Reintjes presented its IPP System (Integrated Propulsion Package), jointly developed with Lips, for the first time in Germany more than two years ago. It marked the largest product offensive in the history of the company, and marked a vast expansion of its propulsion prod-



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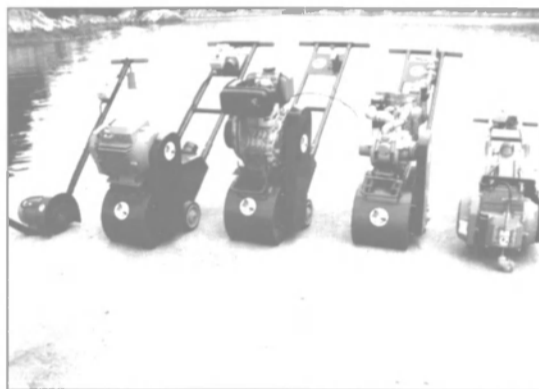


RUSTIBUS PIPE is a new mechanical machine designed for de-scaling and cleaning outer pipe surfaces - 360 degrees in one operation.

Capacity: Approx. 25 meters/hour
Result: SA2.5



RUSTIBUS.COM

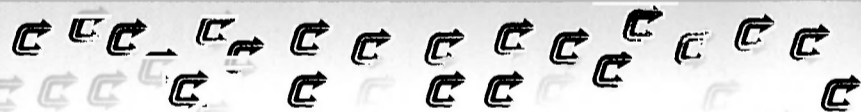


The RUSTIBUS machines remove rust, paint, cement and debris at an average speed of 30 square meters/hour. Rustibus de-scaling machines leaves the surface clean and smooth according to SA1.5.

Capacity R040: 5 square meters/hour
Capacity R200: 30 square meters/hour
Result: SA1.5 Cost: USD 1/m².

N Pat. No. 154516

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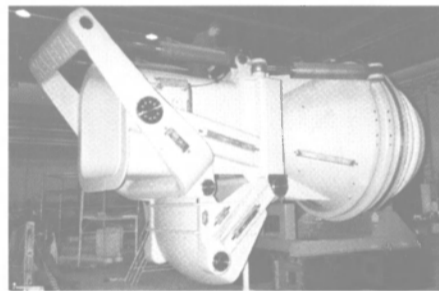
Design • Equipment delivery • Electric automation • Commissioning services

ucts, particularly in the workboat market. One of the company's initial successes was with an order for gears from Trasmediterranea of Spain. To stay competitive, the company initiated a large fleet renewal program, ordering a pair of fast (23 knot), large (564 ft. (172 m)), as well as a 508 ft. (155 m), 22-knot RoPax. The ferries are outfitted with Reintjes DLGF 8890 series twin gears, and the RoPax is outfitted with two Reintjes twin gear of the DLGF 7790 series.

The fast craft niche, in fact, has been a lucrative one for the company, as the Reintjes VLJ 6831 is featured on the fast cat ferry Millennium built by Incat for Trasmediterranea. This year the company will also deliver gears from its VLJ series — a series with outputs up to 11,000 kW — in orders totaling more than \$5 million.

Circle 39 on Reader Service Card

Rolls-Royce Delivers World's Largest Waterjet



The first pair of Kamewa 200 SII water jets, and two smaller units, is being installed on a 459 ft. (140-m) monohull fast ferry under construction at Alstom Leroux Naval's yard in Lorient, France for Greek owner NEL Lines. The vessel is scheduled to enter service this summer.

Known as the world's largest steerable water jet, the SII, which as an inlet diameter of 200 cm, has been delivered from Rolls-Royce in Kristinehamn, Sweden. This Kamewa 200 SII water jet unit has an inlet diameter of 200 cm.

The Corsaire 14000 design steel-hulled ferry will use four water jets powered by gas turbines and diesel engines with a total power of 66,200 kW to provide a speed of over 40 knots, carrying 1,800 passengers and a combination of 450 cars. It also houses two Kamewa Ulstein tunnel thrusters supplied by Rolls-Royce.

Circle 47 on Reader Service Card

Large Passenger Vessels Benefit From Norsafe's Rescube

With a significant trend leaning toward larger-sized newbuildings, with some vessels able to carry up to 5,000 passengers, a new challenge is presented to both passengers and crew regarding a

quick and easy escape during emergency situations.

Current systems require all persons onboard to assemble at the same deck level for evacuation for lifeboats, marine evacuation systems (MES) or inflatable life rafts. In essence, there is a potential problem in the pressure created by such large numbers of people moving together

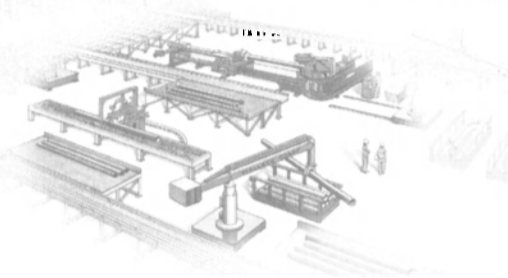
to one level.

Known as a new concept specifically tailored to provide advantages of free fall systems in a solution suited to passenger vessel installations, Rescube is free-fall escape system that enables dry evacuation of passengers and crew. Consisting of three capsules each with two boarding levels, stowed vertically on

each side, Rescube allows evacuation from each of six deck levels. Fully boarded, Rescube swings out to launch position and is ready for free fall evacuation into the sea. The system fulfills another function in that the three capsules provide a safe haven for passengers in the stowed position.

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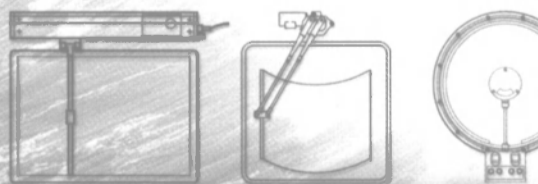
See us at FABTECH booth #2136

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High Performance Wiper Systems

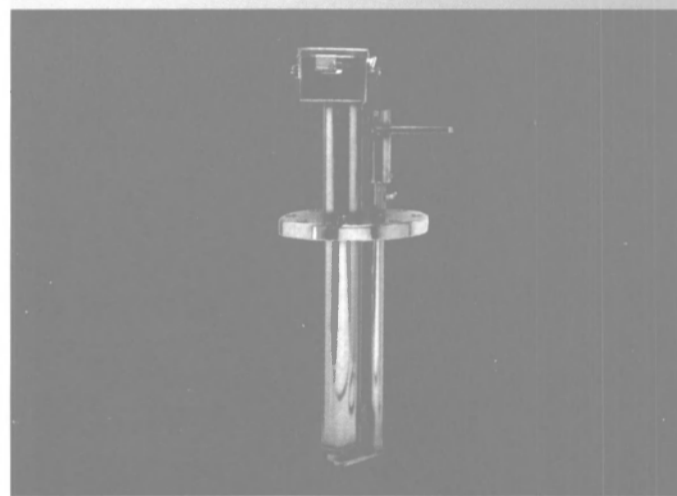
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- Pantograph window wipers
- Pendulum window wipers
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- Associated control systems



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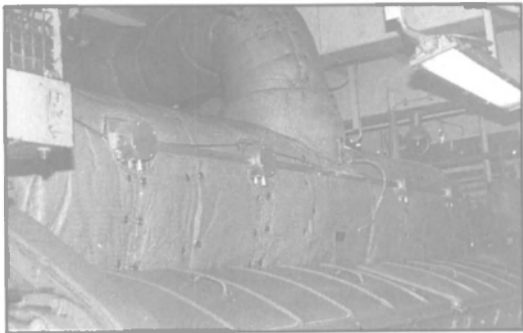
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Engineered Solutions

EnSolve Develops Innovative Oily Water Separator

EnSolve Biosystems has developed and is offering the PetroLimiter, a biomechanical oily water separator for the marine industry. In fact, the Raleigh, N.C., company was recently presented the Seatrade Award for countering marine and atmospheric pollution

"The PetroLimiter was developed to overcome the persistent problem of bilge water treatment on seagoing ships. Conventional oily water separators have been blamed for numerous oil discharges into the marine environment, leading to large fines and even criminal prosecution for shipowners and masters. The PetroLimiter offers a reliable and cost-effective solution," said Dr. Jason Caplan, president and CEO of EnSolve Biosystems.

The PetroLimiter, introduced to the world market in 2000, is the world's first biologically based oily water separator, which is designed to provide reliable, cost-effective treatment of ships' bilge water to meet international clean-water standards. It uses safe, non-pathogenic bacteria (six to seven different species) to remove oil, grease, detergents and other hydrocarbons from bilge water so it can be safely discharged overboard into environmentally sensitive oceans and waterways. The product has been type-approved by the U.S. Coast Guard and Canadian Department of Transport, certifying compliance with International Maritime Organization (IMO) carriage requirements.

The system should prove particularly interesting to vessel owners for more than its environmental merits.

PetroLimiter is described by its maker as "virtually maintenance free," with no filters or ceramic beads to clean or replace. It is also designed to easily remove emulsified oil and detergents

EnSolve Biosystems is an early-stage biotechnology company based in the Research Triangle region of North Carolina. The company has received numerous awards and financial support from the North Carolina Biotechnology Center for research and development. EnSolve's other products for the marine market include bioenzymatic degreasers and oil-spill cleanup products.

Last year the company made two significant strides in expanding the products exposure in the marine realm, signing an order with Interlake Steamship Co. to supply two PetroLimiter 630 systems for the MV Mesabi Miner and MV Paul R. Tregurtha. Also, it signed with Bath Iron Works, a general Dynamics Co., to cooperate in introducing the system to select military and commercial markets.

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FOR SOME VERY GOOD REASONS
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HYDROSTATIC RELEASE UNIT IS **No.1**

Hammar H20 secured to liferaft cradle and attached to liferaft lashing with sliphook. Painter line shackled to weaklink and strong rope with single point connector.

If the vessel sinks, the water pressure will activate the sharp knife which cuts the strong rope that holds the lashing and the liferaft will float free.

As the vessel sinks, the painterline will be stretched and the liferaft starts to inflate.

Red weaklink breaks and survivors can board the inflated liferaft.

- Revised model with a single point connector for painter line
- Simple to install, safe and has a more effective construction
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Titan Innovation Replaces Sheerleg Crane



Pulling AN TAI onto the barge



"AN TAI" coming onto the barge.

Titan Maritime LLC, a Florida based marine salvage company, has completed removal of the An Tai stern section.

The stern of the wreck of the 9,081 gt, General cargo vessel An Tai comprised of cargo holds three, four, five and the engine room, has been successfully raised and is on the deck of the barge Britoil 43. The An Tai broke into two and had been lying on the seabed since November 24, 1997. The cargo, which had to be removed prior to raising, was approximately 8,500 tons of bagged fertilizers, sodium sulfate, magnesium sulfate, soda ash and caustic soda.

The plan to chain cut the wreck and remove it in several pieces was abandoned when the construction of Titan's new sheerleg cranes (currently being built in Port Klang) was delayed. As a result, an alternative plan was devised, which involved Titan submerging the stern of the barge Britoil 43 into the mud at the stern of the An Tai. The stern section of the An Tai was then pulled aboard the Britoil by way of Titan Pullers.

Operations to remove the much smaller and lighter bow section comprised of holds one and two, which remains on the seabed, will begin soon.

Circle 32 on Reader Service Card



A Titan salvor wonders why the barge didn't pull with 600 tons.

NavCad V4.0 Released

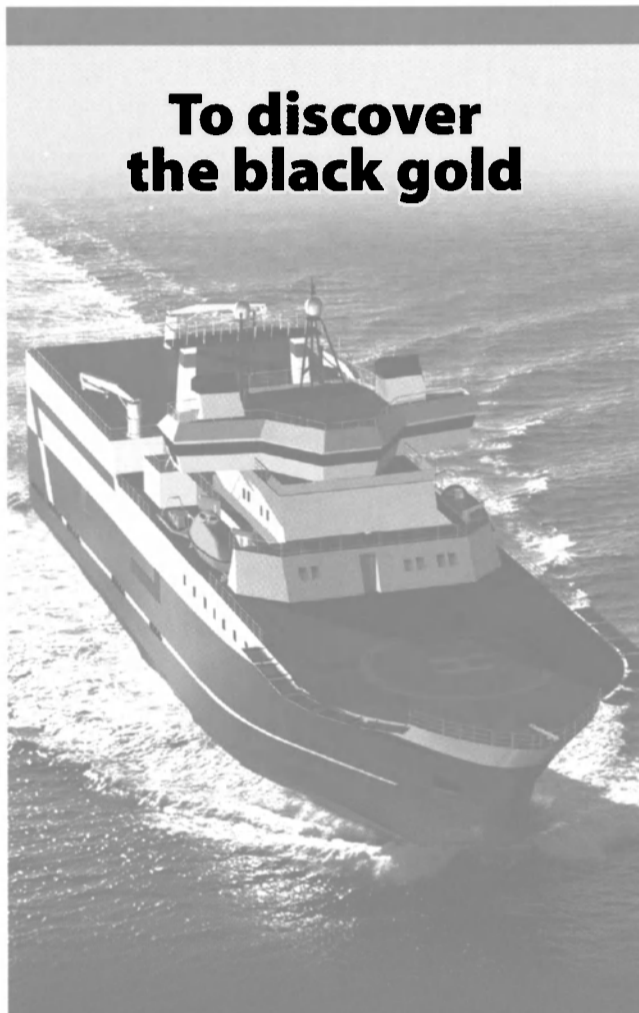
HydroComp, Inc. of Durham, N.H. released NavCad v4.0. — a software tool for the prediction and analysis of vessel speed and power performance. In terms of looks-and-feel, it is a comfortable transition, the interface is virtually identical to version 3. Regarding the functionality of the program, it is a

major upgrade. Through version 3, NavCad was a 16-bit Windows application, supporting all versions of Windows back to 3.x. version 4 is for 32-bit Windows only and will leverage modules developed for PropCad and PropExpert. The initial release of version 4 will match the features of the last build of version 3. From this point on, however, version 4

will be enhanced with many new features. HydroComp is particularly excited about the end-user programming features under development for version 4. Users will be able to program and run NavCad from other calculation processes or to allow completely custom sets of calculations.

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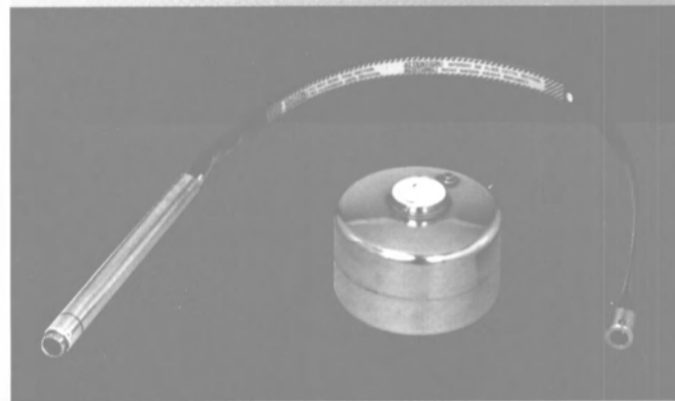
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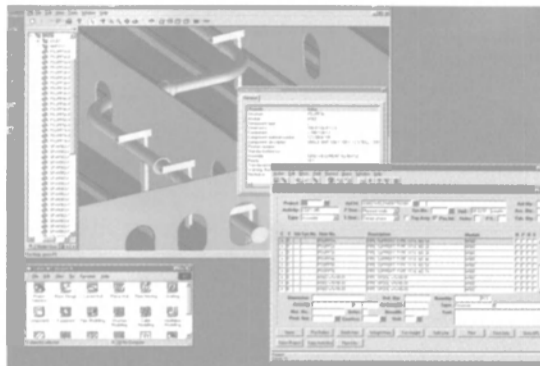
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The Tribon M1 Developer's Toolkit

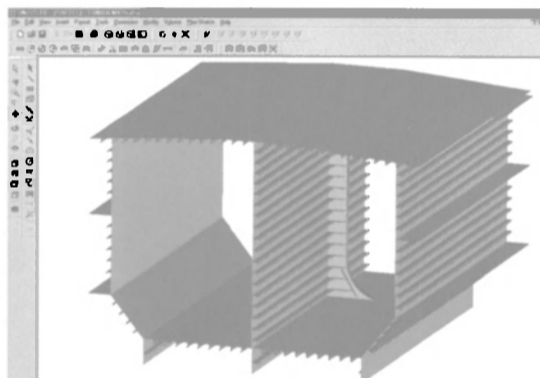
In order to allow its customers to create specific developments to the Tribon Shipbuilding system to extract even greater competitive advantages, Tribon Solutions has created the "Developer's Toolkit" of the Tribon M1 Shipbuilding system on Windows NT based on Tribon M1 Vitesse and Oracle technologies. The Tribon M1 Developer's Toolkit enables the user to write their own programs to control design development according to their own rules with direct access to the Tribon Product Information Model and all the functionality of the Tribon M1 applications. The Developer's Toolkit can be applied from the smallest design standard to complete sections of ships thus reducing design man-hours and improving quality. The Toolkit incorporates features for integration with ERP-type (Enterprise Resource Planning) systems that can support the adaptation to an existing IT system architecture of a shipyard. By using the Tribon Product Information Model database, the same data can be used and re-used between what traditionally have been separate systems. Materials administration, procurement, overall planning, workshop/detail planning, financial and human resource systems are some of the systems that now can be connected to Tribon to create shorter lead times and improved efficiency.

The integration and sharing of data can, for example, take place in the hull steel and outfitting material definition, early equipment definition, prefabrication/parts manufacture, assembly parts lists and installation/commissioning. By using Tribon M1 Vitesse and Oracle technology, these interfaces can be configured and adapted to specific requirements. This could for example be applied in retrieving production or purchasing status for use within the Tribon M1 Shipbuilding system.

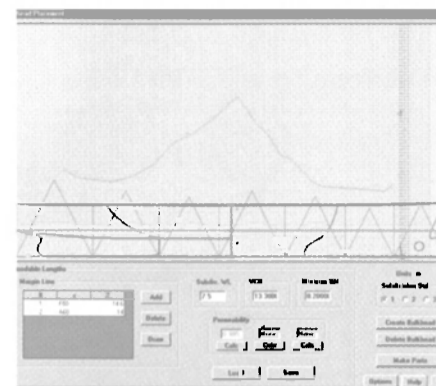
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An assembly unit containing pipe spools and pipe supports as viewed in the Tribon design system. The design model data is readily available for materials administration as an "assembly parts list" which is viewed in the materials system window.



Detail from a Tribon Product Information Model 3D Hull block, which is automatically generated using tools in the Tribon M1 Developer's Toolkit.



Bulkhead Placement Dialogue (showing floodable length curve)

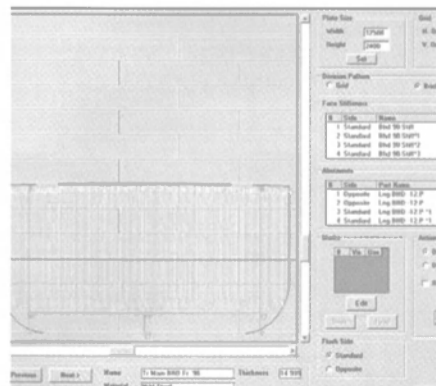
Autoship Systems Software: Ruling The Waves

For 20 years Autoship Systems Corporation (ASC) has helped to rule the unruly waves in the marine CAD/CAM software industry, providing products and marine engineering services to customers worldwide. The company is enjoying good success currently with Autostructure, an advanced internal structural design software.

In less than a year Autostructure has become an integral component of CAD/CAM software suites in major shipyards around the world. The software is designed to provide easy parts generation, sophisticated editing, extensive CAD output, and customizable reporting capabilities.

An example of an advanced feature is Autostructure's Copy Panel Configuration dialogue. To increase efficiency and get a project completed sooner, users employ this dialogue to copy details (openings, stiffeners, cutouts and markings) quickly and easily from one flat part to similar flat parts. The settings at the right of the screen provide easy control over which details to copy.

Another key efficiency feature is Autostructure's Report Manager, which facilitates inclusion of designed parts in any report by using the same on-screen



Panel Subdivision Dialogue

The LEADER in Maritime Communications



The US Military has unique requirements for telecommunications services and Maritime Telecommunications Network meets their needs. MTN provides dedicated private networks to the US Navy from nuclear aircraft carriers to supply ships.

MTN currently supports four government contracts: two as a prime contractor and two as subcontractor

MTN has strategically positioned itself to supply both tactical and non-tactical communications services to the Navy by utilizing commercial off-the shelf (COTS) technology and services.

This affords rapid and inexpensive implementation of new services. Because of this pioneering effort, MTN provides communications services to the Government that save money and do not sacrifice quality.

If your network needs the security and reliability demanded by the US Navy, call the Leader in Maritime Communications.



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Item	Weight	Cg	Item
Deck	43714	52.267	0.0
Transverse Bulkhead	12216	59.142	0.0
Longitudinal Bulkhead	14812	58.362	0.0
Star Plate	36369	52.267	0.0
Sea Deck	31503	52.267	0.0
Grand Total	121147	52.267	0.0

Autostructure's Report Manager

browser that you use in Autostructure. Weights and Centres, Bill Of Materials and Welds reports are all available, and may be printed directly and/or saved to disk. Quick and efficient customization is achieved using Crystal Reports, which ensures that the final look of a report is to the company and customer specification. Autoship Systems' new and future developments are designed to integrate with other market-leading software. In fact at this time, Autostructure is integrated with a leading piping design program. (An official announcement will follow soon.)

Circle 42 on Reader Service Card

Yachting Consult Offers MasterShip

Yachting Consult is a fast growing player in the field of work preparation and engineering process services for shipbuilders. The Dutch company provides experience and skills in CAD/CAM engineering and software, as well as logistic services such as transport and just-in-time delivery of ship parts, for both ships and yachts. Yachting Consult Engineering services include fairing hulls, and engineering of the ship's construction, interior, and piping. Typical projects include workboats, ferries, fast catamarans and megayachts. A new development in progress is global engineering: YC Engineering is able to deliver kits or cutting codes worldwide. This has been done to shipyards in South Africa, Middle East, Eastern Europe and lately in Singapore.

During the Norshipping exhibition Yachting Consult will also promote the newest MasterSHIP edition, MasterSHIP 2001. This AutoCAD based software package is used by shipyards, designers and engineering companies


around the globe for CAD/CAM engineering applications. It turns ship designs into production information for steel and aluminium parts. MasterSHIP was developed for internal use at first, but when customers couldn't find anything like it in the market, Yachting Consult successfully started to sell and support this software next to their exist-

ing engineering and logistic services.

MasterSHIP consists of three modules. The Shape Generator ensures a shape model of the hull and superstructure. The Parts Generator creates the hull expansions and the internal ship construction. The NC Generator nests parts into sheets or lengths of material and converts these nestings into NC

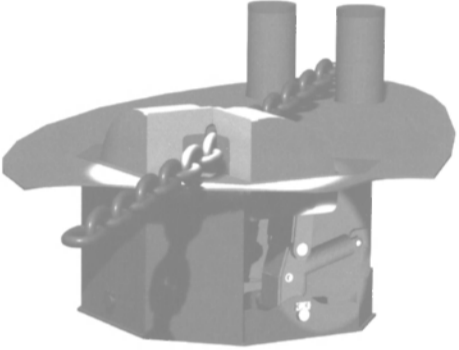
codes. The MasterSHIP Organizer is active during the entire project and used by engineers to access ship parts, to retrieve them for nesting and to generate weight calculations and material reports. The new MasterSHIP release supports the latest AutoCAD version 2000i.

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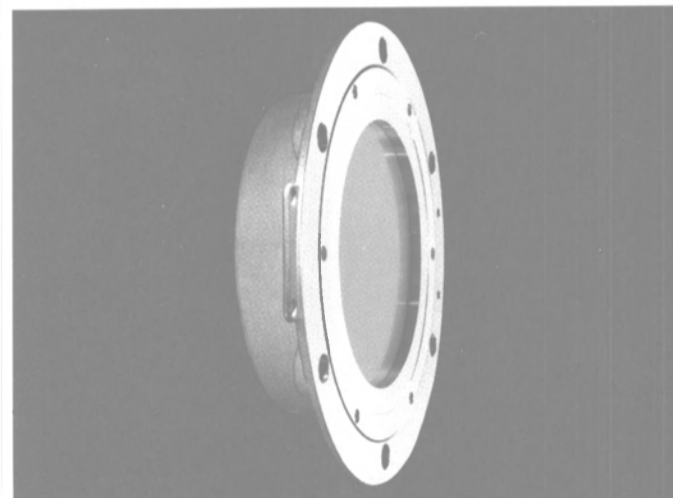
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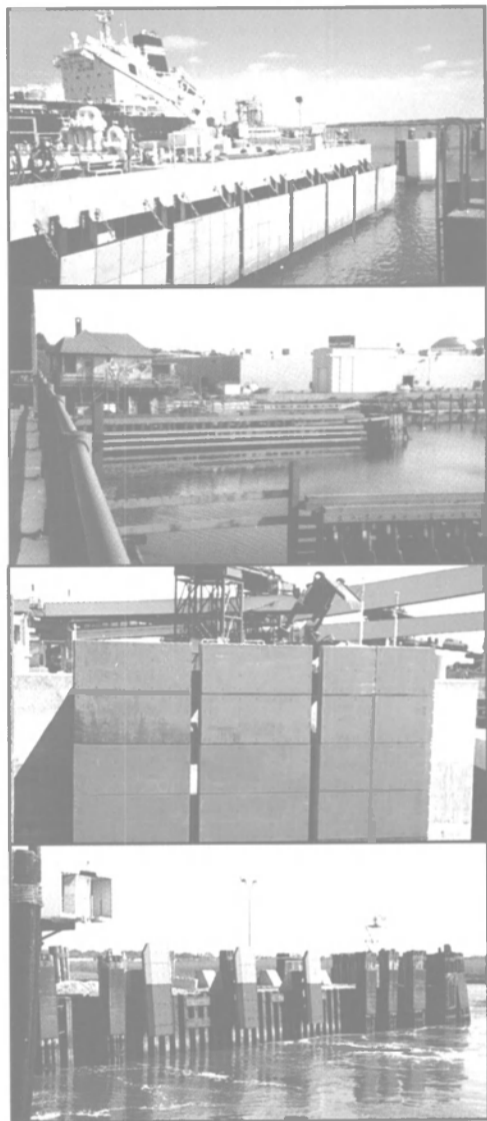
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May, 2001

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Barging Ahead

By Chris Leigh-Jones, chairman, International Bunker Industry Association (IBIA)

Barge operators are often accused of giving the marine fuels industry a bad name. While it is true that there are barging companies with a debatable approach to the business, they are very much in the minority. Worldwide, barge operators are working hard to improve their services and operations. In many respects, they are leading not only the bunker industry — but shipping as a whole. Nowhere is this demonstrated clearer than during barge-to-ship transfers of oil; nowhere is this expertise better demonstrated than in the U.S.

Operating bunker barges in the U.S. is a fraught business. To say the very least, U.S. authorities do not like oil in their harbors, and culprits can find themselves on the sharp end of some harsh penalties if negligence is proved. In addition to the penalties, the bureaucratic paperweight that descends on bunkerers subsequent to a spill is hefty indeed. According to one U.S. bunkerman, no fewer than 17 officials turned up when a couple of gallons of oil were spilled by his company during a delivery.

There is, then, plenty of incentive for U.S. bunker barge operators to get things right. And, it has to be said, the U.S. has some of the world's best barging companies plying its harbor waters. IBIA recently looked at the issue of



quality barging in its quarterly journal World Bunkering. One of the respondents to a questionnaire sent to a quartet of quality barging firms around the world was a Houston-based firm. The questionnaire was designed to find out how companies are tackling the issue of spill prevention in the face of ever increasing regulatory pressure. Its findings show that bunker barge operators are taking spill prevention seriously and that measures that have been introduced over the last decade have had a dramatic impact.

Analysis of spills shows that human error plays a large role, often fueled by a lack of communication between barge crew and the personnel on board the receiving vessel. To eliminate, as far as possible, accidents from occurring due to miscommunication, the Houston respondent to IBIA's questionnaire has drawn up a bunker transfer procedure form. This outlines which grades of fuel the receiving ship would like, in which order and at which pumping rates. The form also has spaces for tanker measurement prior and subsequent to the oil transfer. The form is completed by the chief engineer and signed. It provides a blueprint for the bunker transfer and fixes everyone's minds on what must

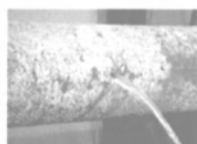
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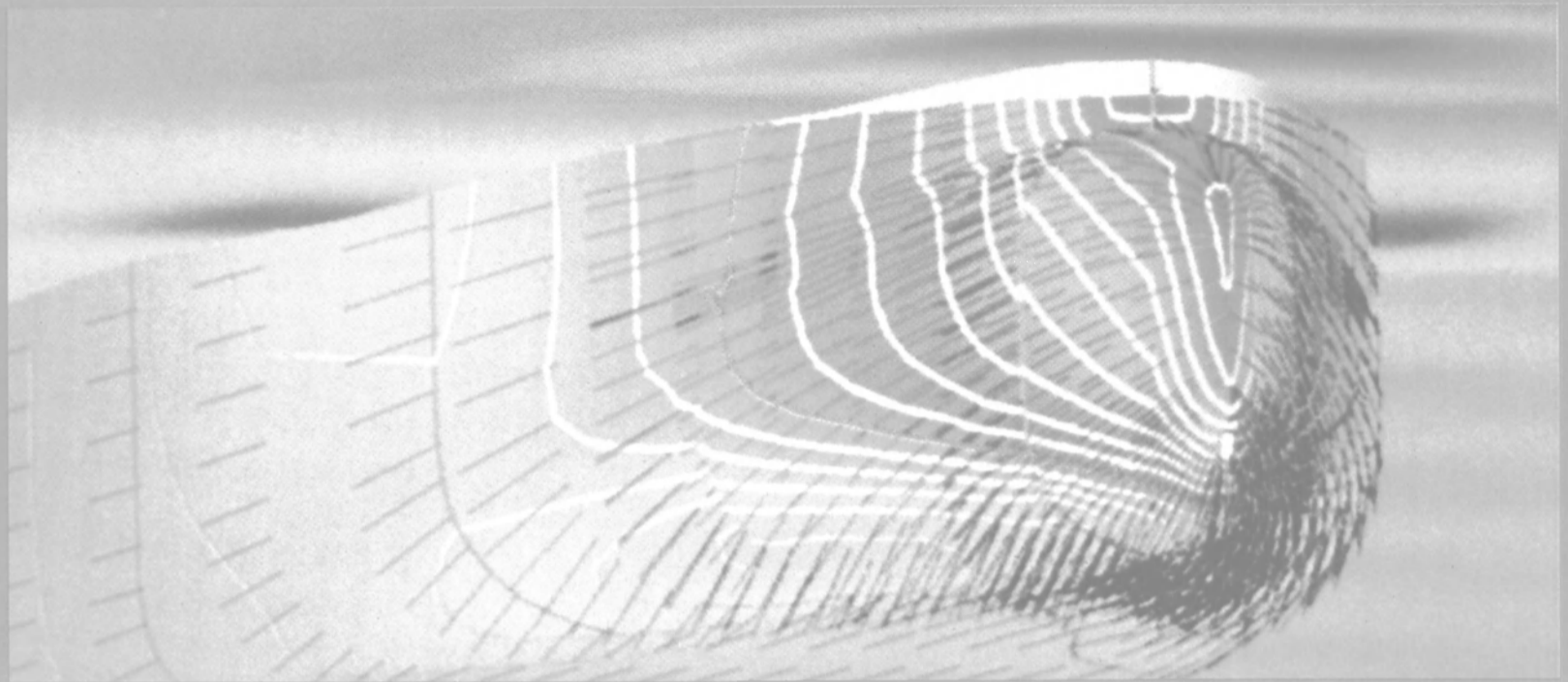
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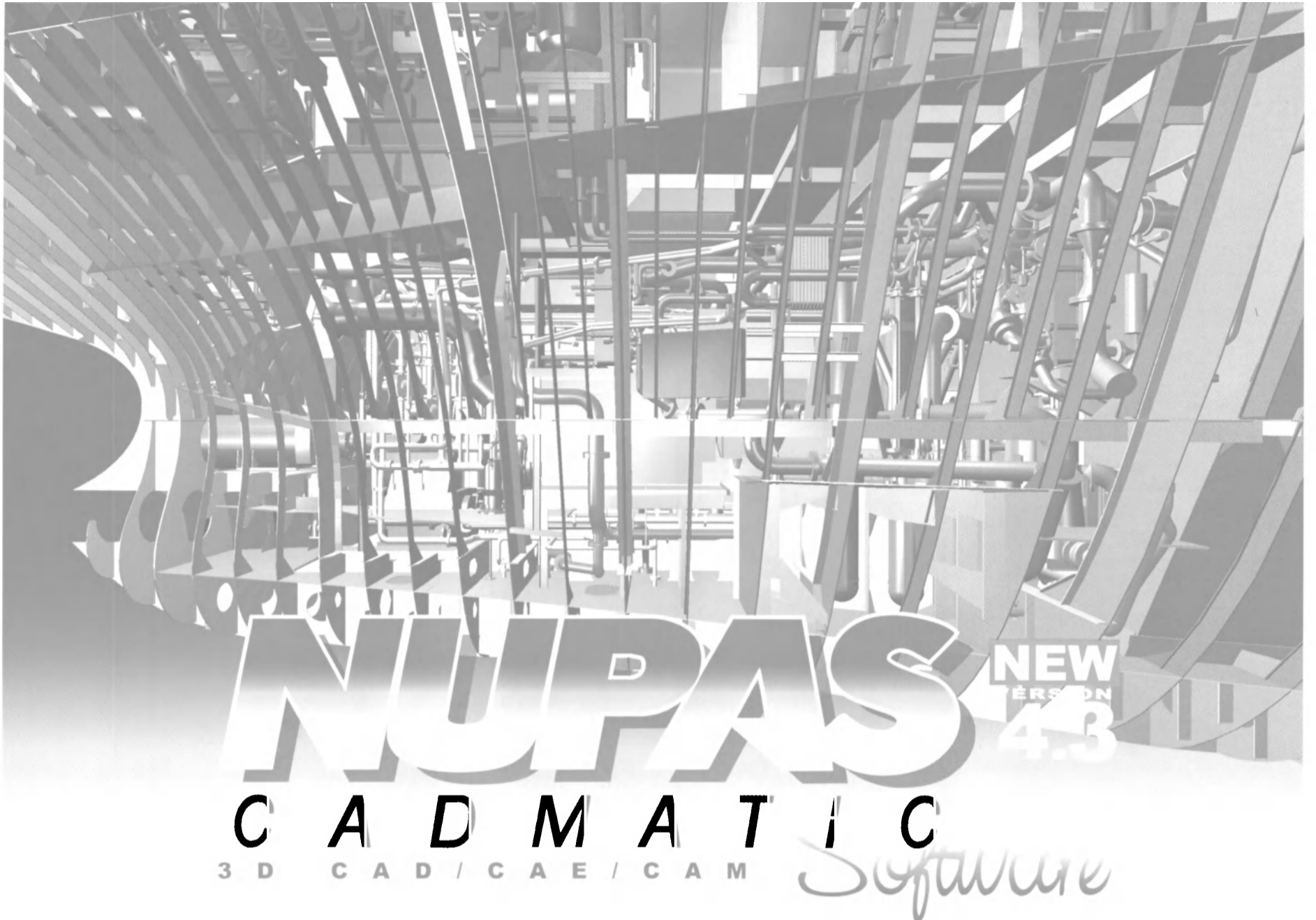
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Fuels and Lubes

happen.

Having procedures in place only works properly if personnel are made aware of the importance of following them and proper training programs are implemented. IBIA has education as its cornerstone and has produced courses and publications to help those in the industry understand their chosen profession better. The message is getting through and many companies in the bunker business, including barge operators, have drawn up training programs for their staff.

Procedures and training are only two parts of the equation, though. Improved hardware too has helped reduce spills, or mitigate their consequences should one occur. Most obvious is the introduction of double-hulled barges in U.S. ports, in line with OPA 90 legislation. As older barges are phased out, the world's barging fleet will increasingly become double-hulled. Improved designs will also mean that they become more robust. While there are few global limits on the age up to which bunker barges can be kept in service, current pressures in the sea-going tanker industry will likely trickle down into other industries too. The days of the 30 or 40-year-old bunker barge are numbered.

In addition to youth and more robust hulls, small alterations to deck configurations also help reduce the chances of a spill. Higher deck coamings and spill rails have had a significant impact. One U.S. barge operator has gone on record as crediting the introduction of higher spill rails with the prevention of at least three spill incidents in recent years. Where the oil would previously have flowed into the port waters, it was contained on deck and cleared.

Nothing is perfect, of course. It is no surprise that given the vast number of bunker operations worldwide annually, spills still happen, albeit only very occasionally. When they do occur, the introduction of new equipment has helped contain spills and limit their consequences. Spill booms that can be deployed in a matter of minutes are in operation in the U.S., for instance, preventing oil spills from getting out of hand. Some shipping companies, wary of the penalties of even the most innocuous spill, have started to request that bunker barge operators deploy the spill booms prior to pumping on any delivery. It is more work, with associated costs, but ship operators are willing to pay the extra and they are finding a larger number of barge operators able to provide them with this added assurance.

Lest anyone be in any doubt about the financial consequences of a spill, a quick look at the insurance cover barge operators carry should dispel any com-

placency.

In Europe, one Rotterdam-based operator has admitted to being covered up to \$500 million. In the U.S., cover typically tops \$300 million. These figures reflect the severity of the consequences of spills.

Planning, training, equipment, and above all communication are the factors that contribute to incident-free oil transfers.

Barging companies know this and the leaders in the field, including quality outfits in the U.S., have implemented

managerial and operational procedures to keep bunker oil separate from harbor waters. Barge companies may once have been the whipping boys of the industry, now they are playing an important role in whipping it into shape.

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Fuels and Lubes

Size Matters

The bunker industry is changing. Bunker buyers want bigger stems, broader choice of grades, more delivery locations, higher standards, additional services, and consistency. Port authori-

ties also want consistency, along with no pollution, more monitoring, increased regulation, heightened benchmarking, enhanced co-operation, and better transparency. To keep everyone happy, bunker suppliers have to rethink their approach to the market. A local, national or even regional approach is no longer sufficient. To be long-term player in

today's marine fuels business, suppliers will have to embrace globalization, and make their service worldwide in scope and application.

Globalization has already transformed many international businesses such as the airline industry, banking and communications. Shipping has not been left untouched. Buyers are getting together -

Maersk and Sealand, P&O and Nedlloyd, NOL and American President Lines, Carnival and everyone who owns a



By **Peter Healy**, director, ExxonMobil Fuels

cruise ship. Ships are getting bigger too: 6,000 to 8,000 teu containerships are the norm in the box trade, and they are thirsty beasts. Consider also the potential demand for bunkers from the 10,000 to 12,500 teu vessels in development. Cruise ships are growing as well. Royal Caribbean International recently launched its Explorer of the Seas, a 142,000-gt titan that can easily swallow up more than 2,000 tons of bunkers at a single sitting.

The message to bunker suppliers is clear. They too must get bigger if they are to service this new market. Small companies will be able to find niche markets in which to survive, but to be a true player companies will have to grow, or go.

Already, this trend is taking shape in the industry. Among the oil majors, newly-forged entities such as TotalFinaElf, BP Amoco Arco (now simply BP) and ExxonMobil have created more expansive supply global networks. Among the independents, a number have established strategic alliances and broader supply structures. This not only means more deliveries in more ports, but also results in improved availability of fuel grades across the supply chain. The further your reach, the farther you can source product. Moreover, extensive networks mean wider availability of bunkers that meet the strictest quality and environmental standards. As the demands associated with bunkers increase, those in the industry will find that the best way to react is by associating themselves with the adage that big is indeed better.



This year's SeaTrade Exhibition in Miami, Fla. from March 5-8, provided a platform for members of the industry to get together with myriad of media outlets, as well as with each other. *MR/EN's* senior editor, **Regina Ciardiello**, (left), caught up with **Brian Fournier**, president, Portland Tugboat; **Ben Snow**, manager Marine Operations & Administration, Port of Portland, Maine; **Barkley Wilkins**, marketing manager of Hvide Marine Towing, Tampa, Fla.; and **Amy Powers**, marketing manager, Port of Portland, Maine, at one of the conference's many networking events.



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ISU Survey Points Out Bunker Concerns

During 2000, member salvors of the International Salvage Union (ISU) responded to more than 300 marine casualties where there was a possibility of a pollution event arising. The Union reported that there was a significant increase in both the number of services provided and the total volume of potential pollutants recovered.



ISU salvors responded to 310 casualties with a potential for causing the environmental damage, as against 232 in 1999 (an increase of one-third). The figure of cargoes and bunkers that had been salvaged rose to a little more than 36 percent, from 434,100 tons to 591,202 tons.

Commenting on the outcome of the most recent ISU Annual Pollution Prevention Survey, president Jean Labescat says: "The increase on 1999 is significant, but the total of pollutants recovered is only half that of 1998, when a total recovery of 1.18 million tons was recorded."

Labescat also discussed the sharp drop in the amount of chemicals involved in salvage operations and an expanded focus on the removal of marine fuels as the first step in casualty salvage - reflected in an increase of approximately 28 percent in the volume of bunkers recovered last year.

In 2000, ISU can be credited for the salvage of 310 salvage assistances reported in the survey recovered the following: 71 percent crude oil; two percent chemicals; 13 percent other pollutants; and 14 percent bunkers.

The amount of crude oil recovered was equal to approximately six spills of Sea Empress size. While there was a major reduction in the tonnage of chemicals involved in casualties, this was matched by an equally steep increase in the tonnage of other potential pollutants (such as slops and dirty ballast).

Last year also included 15 salvage services, which involved tankers (20 in 1999). The largest tanker involved was laden with 140,000 tons of crude oil. There was a substantial fall in the number of casualties requiring ship-to-ship transfer services — six, as compared to 20 in 1999.

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New Bunkering Firm Formed

A new Bunker Trading Company was established in Singapore in early April. The company is called United Bunkering & Trading (Asia) Pte. Ltd., and is backed by a major European investor. In the year 2000/2001, the total turnover

reached \$600 million.

United Bunkering & Trading (Asia) Pte. Ltd., said it can handle supplies of bunker oil to ships throughout the world and also supply other naturally related products and services, like lubricants, crew change and agency service.

United Bunkering & Trading (Asia)

Pte. Ltd., is staffed by **Daniel Cheong**, Managing Director; **Peter Chng**, Bunker Trader; and **Linda Lee**, Secretary/Administration.

The new company can be reached at Tel: +65 37 222 05; Fax: +65 32 470 08; E-mail: ubt@ubt.com.sg

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Carnival's New Spirit

The latest testament to Finnish cruise ship building prowess is embodied in the recently delivered Carnival Spirit, a ship that will become well-known not only for what it contains within, but for what it does not let out.

Carnival Spirit, newbuilding no. 499, was built at Kvaerner Masa-Yards' Helsinki New Shipyard for Carnival Cruise Lines, and is the second ship in a series of "Panamax-Max" size ship. (The first, Costa Atlantica for Costa Crociere, was delivered in June 2000). Interestingly, the ship is unique because of its similarity to other vessels. The joint development of the Spirit-class series actually started in the mid-1990s,

with KMY presenting its "Project 8000" vision to Carnival in 1994. Carnival's Joe Farcus then presented layout sketches of the new design, and the yard worked on fitting them on the lower part of the existing Fantasy-class design, as a common basis for a new Panamax design. Thus the idea of common platform ships for three different Carnival brands — Carnival Cruise Lines, Holland America Line, and Costa Crociere — was born, a solution which included similar hull structure, similar machinery arrangement and similar technical spaces. The common system obviously offered to Carnival attractive, and more cost-efficient, means of maintaining the

ship.

While a walk through the ship allows one to quickly know that there is nothing else like this afloat — Farcus intermingled a variety of interpreted styles of Chinese, Art Deco and Egyptian, to name just a few — the parent company revels in the fact that the technical requirements of its burgeoning fleets are more easily managed.

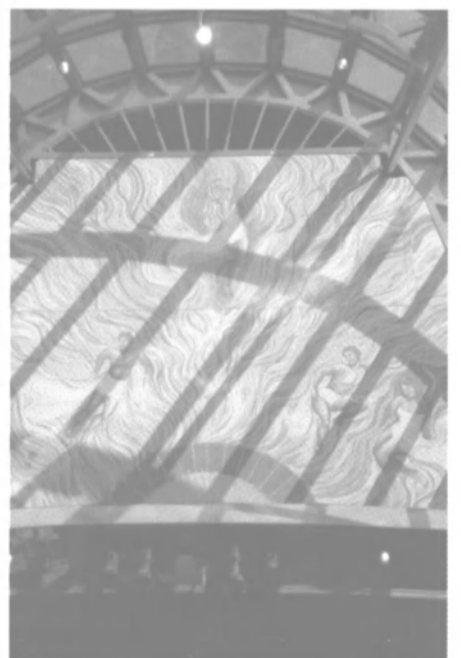
No Smoking

While the size is impressive, the vessel is most significant, however, as it is the first example of a joint Carnival/Wartsila NSD project to develop "smokeless" diesel engines, an environmental mandate increasingly heard from the residents of the natural environs within which cruise ships operate.

The ship is powered by a diesel-electric machinery arrangement, consisting of six Wartsila NSD 9L46D diesel engines, providing a total power of 62,370 kW. Each is connected to an alternator that produces electricity to the ship's main electric network at 11 KV 60 HZ 3 phase. Power from the main switchboard is supplied to 440V switchboards via three transformers to service auxiliary machinery and ships services. A separate MG stabilized power system is supplying lighting and small consumer needs. The "EnviroEngine" technology, initially installed on two of the diesel engines, uses common rail fuel injection, giving high injection pressures at all engine speeds to ensure clean combustion with no visible smoke emission. According to Wartsila NSD's well-regarded R&D maven Daniel Paro, the EnviroEngine took just 14 months from the company's initial commitment to the project to first installation.

Carnival Spirit is propelled through the water to a service speed of 22 knots via a pair of 17.6 MW Azipod propulsion units. In addition, maneuverability is aided by three 1.91 MW bowthrusters.

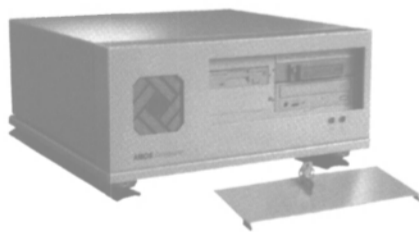
In addition, the ship features a high level of redundancy to ensure safe operation. The machinery plants are divided into two independent parts. This includes main machinery plant, fuel tanks, electric machinery, auxiliary systems, ventilation, piping, cabling and control and automation, basically from "fuel storage tanks to the propellers." It also features divided redundant main electric distribution and monitoring



Carnival's longtime designer, **Joe Farcus**, melded a variety of styles to depict Carnival Spirit's unique aura. Farcus focused on styles of Chinese, Art Deco and Egyptian, to name a few.



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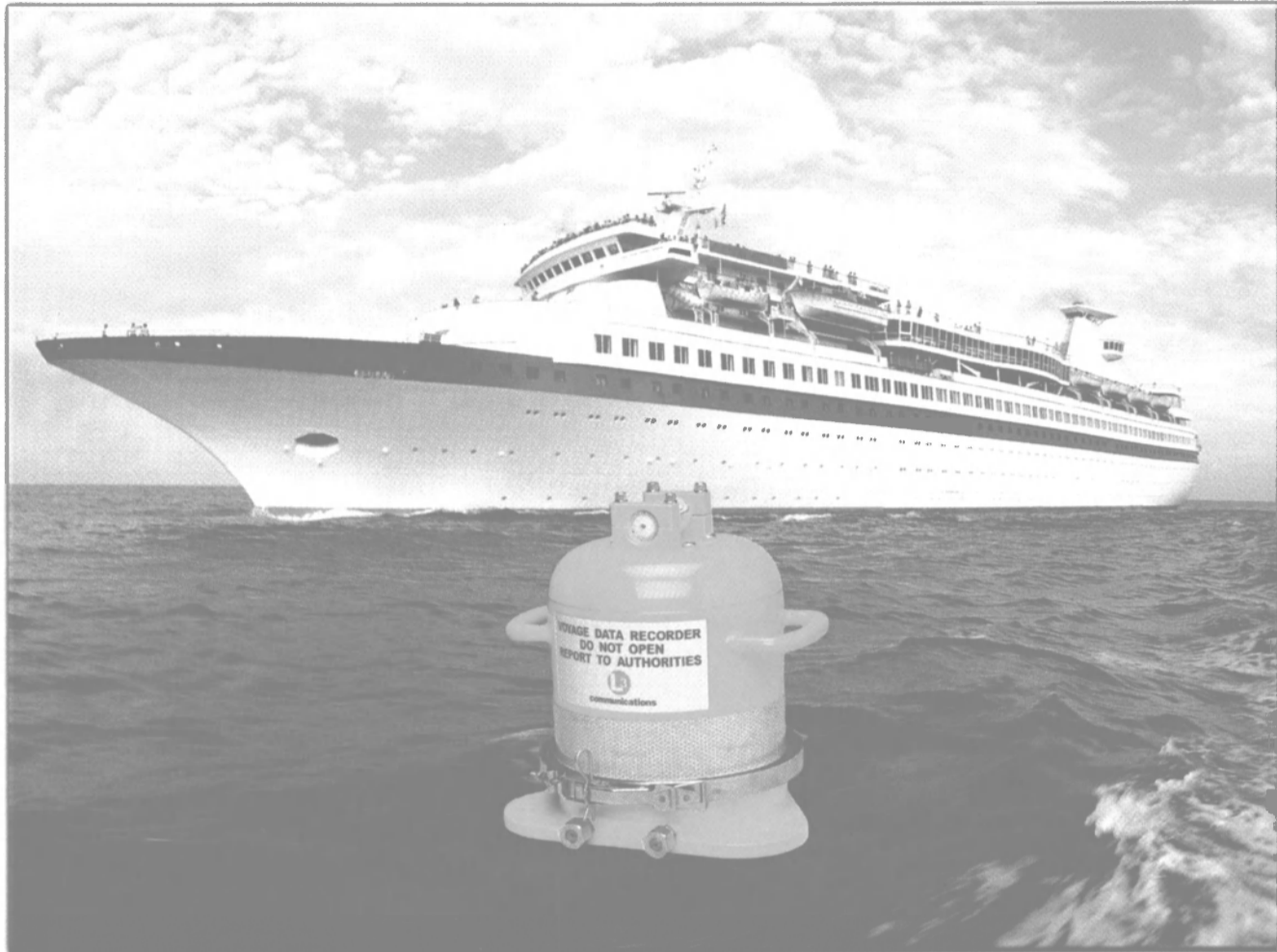
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between the wheelhouse and control room, and between the two separated high voltage switchboards and the two separate cyclo-converter rooms.

Room with a View

In addition to mechanical and environmental achievements onboard Spirit, the

ship is sure to garner top marks from the owner and cruisers alike. The trend for more outside rooms and more rooms with balconies has been building for years. On Spirit, Carnival and KMY deliver with an amazing 70 percent of all staterooms featuring a balcony - 80 percent of which are outside staterooms.

This was made possible, in part, by designing a narrower superstructure, which allowed one more deck with passenger staterooms. There are a total of 1,062 staterooms, and Spirit has a passenger capacity of 2,680. In the superstructure, most of the staterooms face the sea, and the technical spaces, includ-

ing the air conditioning machinery, are placed in the center of the ship, behind the passenger corridors.



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Owner	Carnival Cruises
Classification	RINA
GT	85,700
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Breadth, max	127.3 ft. (38.8 m)
Breadth, dwt	105.6 ft. (32.2 m)
Draft, dwt	25.6 ft. (7.8 m)
Main engines	Wartsila
Machinery	Azipod
Main generators	ABB
Navigation system	STN Atlas NACOS
Passenger capacity, lower bed	2,124
Passenger capacity, max	2,680
Passenger staterooms, total	1,062
Passenger staterooms, outside	849 (80 percent)
Passenger staterooms, balcony	750 (70 percent)
Main restaurant capacity	1,300
Main show lounge capacity	1,170
Crew	961
Speed, service	22 knots
Machinery output	62,370 kW
Propulsion	2 x 17.6 MW

Spirit Earns The Green Star

Carnival Spirit fulfills RINA's new Green Star environmental standards, consisting of two voluntary RINA class notations, Clean Sea and Clean Air. A leading feature of the Clean Sea notation is that bunker tanks must be installed over double bottoms, to prevent accidental discharge of oil. Ships must also be fitted with holding tanks for all black and gray water waste, to prevent organic pollution, and must meet the standards set down in the voluntary IMO Marpol Annex IV.

The Clean Air notation sets limits on SOx and NOx emissions from engines, and requires compliance with the voluntary standards of Annex VI to Marpol. There is a three percent limit on sulfur content in fuel that can be burnt, and RINA also sets requirements for refrigeration gases and their containment in the case of an accident.

Carnival Spirit To Feature Radiology System

A new state-of-the-art "tele-radiology" system enabling shipboard physicians to digitally transmit X-rays and other patient information to shoreside facilities for consultation on a broad range of medical situations will be featured on Carnival Cruise Lines' new 88,500-ton Carnival Spirit.

The new MedServe "tele-radiology" system, which was specifically tailored for the Carnival Spirit by U.K.-based Integrated Dynamics, will utilize a high-speed satellite network link to transmit high-resolution digitized X-rays, electrocardiogram images and other patient data to land-based doctors.



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Meet Me In Oslo

Without a doubt, Oslo, Norway is one of the finest places a person would want to be during early June of any year. The

nearly endless days, with light never quite conceding the sky to night, the vibrant social activities enjoyed equally

by visitors and locals, and breathtaking scenery second to none. Oh, and Oslo also host arguably the world's finest maritime exhibition here every other year, too.

Aptly dubbed "the shipping week you can't miss," Nor-Shipping 2001 is



scheduled to takeover Oslo once again from May 29 to June 1, 2001.

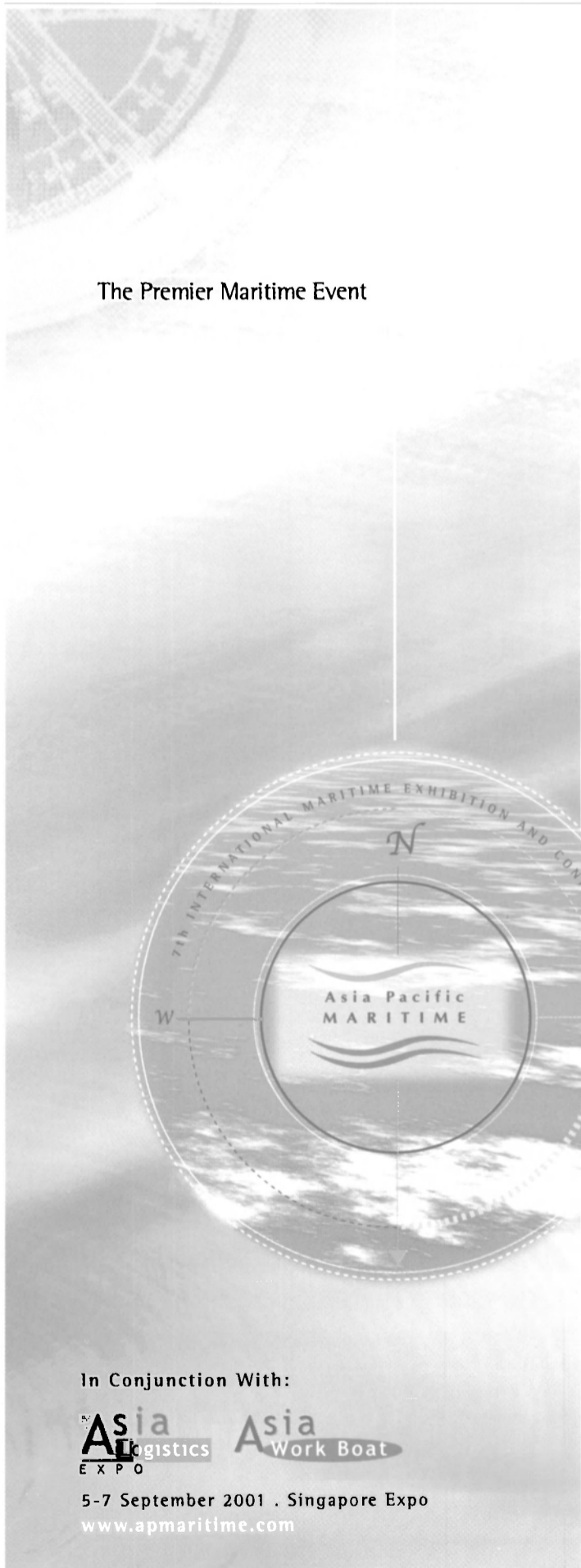
The exhibition, which was at one time long ago thought (erroneously or not) to be an almost exclusive Scandinavian event, has emerged as one of the top two maritime exhibitions in the world, rivaled only by Hamburg, Germany's SMM show. Oslo attracts a truly diverse and international audience of ship owners; shipbuilders; and ship equipment and system suppliers.

Twenty national pavilions are being organized by such countries as Singapore, China, France, Russia, the U.S. and the U.K., and the approximately 650 main exhibitors hail from some 51 countries.

The show has grown so much that 2001 is the last at its current home, the Sjølyst Exhibition Center. Busting at the seams for years, the show has finally outgrown its current environ, and in 2003 it will move to a modern new exhibition and conference center at Lillestrøm - midway between Oslo and its airport.

For those who fear that the move will detract from one of the exhibition's main attractions - Oslo itself - fear not, as the intent is to hold the exhibition portion in a traditional exhibition facility, while maintaining the full roster of social events in and around Oslo. And in the true Nor-Shipping tradition, it is a good bet that just as much business is conducted outside the exhibition hall as in, if not more. Whether on a golf course, out and about at the Aker Brygge, on a fjord cruise or at the famous DNV Barbecue for 2,000 close friends, business ties are formed and strengthened throughout the entire week.

In 1999, Nor-Shipping broke all previous attendance records, as approximately 14,500 industry professionals from over 70 countries attended. They were able to view and make contact with over 1,300 companies from some 50 nations, spread over 650 individual stands.



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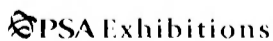
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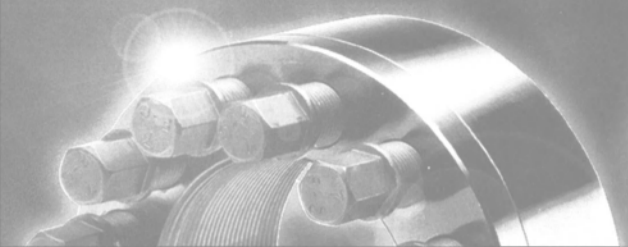


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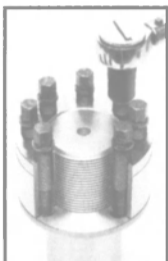


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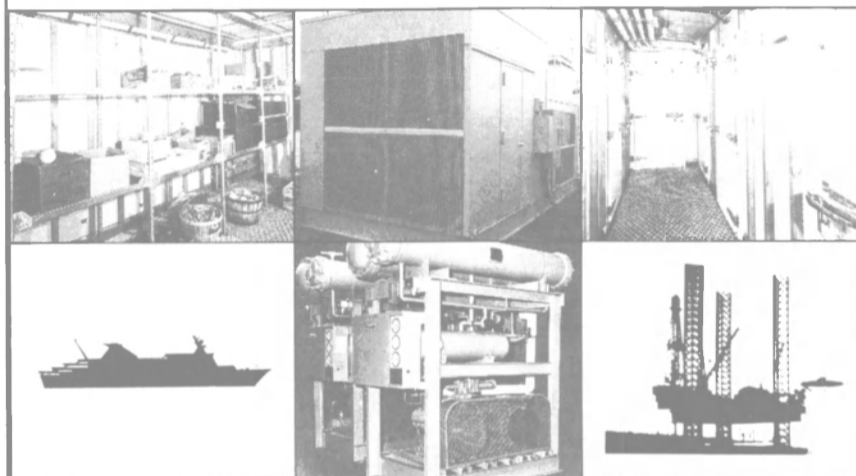


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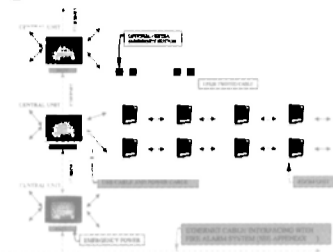
Norway's Caretaker Protects Precious Cargo

Imagine you're onboard a cruise ship and a fire breaks out and you realize that you are trapped in your stateroom — left to inhale the fatal smoke and gas wafting through the vents. Contrary to popular belief, more than 85 percent of fire related deaths occur, not from burns, but

from this type of inhalation. Enlisted to remedy this situation is Caretaker AS, a privately held Norwegian company that manufactures, sells and installs an innovative and patented computerized evacuation and survival system — specifically geared toward the Hospitality and

Lodging industry. Already installed in two hotels in Oslo, Norway, Caretaker is striving to find its niche within the cruise industry. In fact, the company displayed its system at this year's SeaTrade Cruise Shipping Convention in Miami, Fla., hoping to attract such interest. The company's appearance at the show fared them well as they are reportedly ready to

CARETAKER SYSTEM DIAGRAM



sign a contract with a major cruise line.

With its development supported by the Norwegian Industrial and Regional Development Fund (SND), Caretaker is comprised of one unit in each cabin connected to a Central control unit via two-way communication through existing cabling. The Central unit can be hooked up to most any type of data systems for retrieval of information — specifically a ship's booking system and fire detection systems.

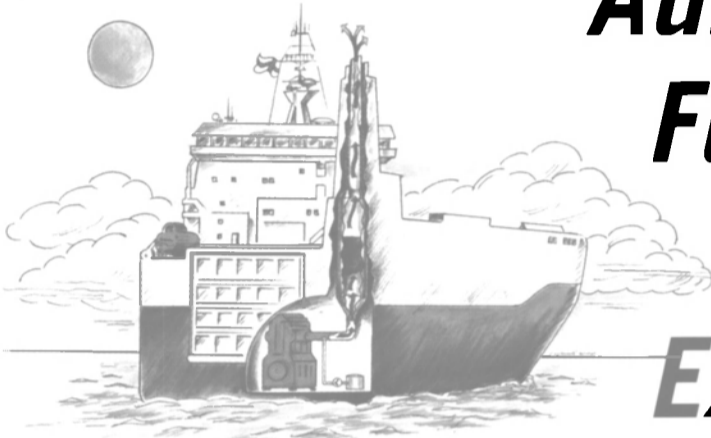
Quality-certified, Caretaker consists of a system with a central panel on the bridge connected to a small cabinet in each cabin through cabled communication. This cabinet holds two Brookdale EVAC U-8 smoke hoods, an LCD display for messaging and an alarm. The system can be equipped with a security alarm button enabling passengers to report other emergencies.

The basis of the cabin unit is to pass information to and from the user. When entering the cabin, the user is registered when inserting the key card in a designated cardholder. The holder can be connected in a way that prevents the light in the cabin from being turned on when the card is not in its holder. In emergency situations the user will receive information via the Cabin unit, which is achieved by a loud alarm signal followed by the LCD screen giving instructions as "Go to lifeboat station" or other important information in the passenger's own language. Personal equipment featured within the Cabin unit includes approved EVAC-U8 smoke hoods, which protect against carbon monoxide and other poisonous gases; emergency lights for illumination of the cabin; and batteries for emergency power. When activated, the emergency button, which is placed by the bed and in the bathroom of each cabin, is linked to the central unit that is present on the bridge and in the medical ward. The crew will use this button in their cabins to confirm that vital information has been received. Subsequent to this, the fire alarm is activated, thus alerting the Caretaker system. At this time, status in each cabin will be presented graphically and in print via the screen and the printer of the central unit.

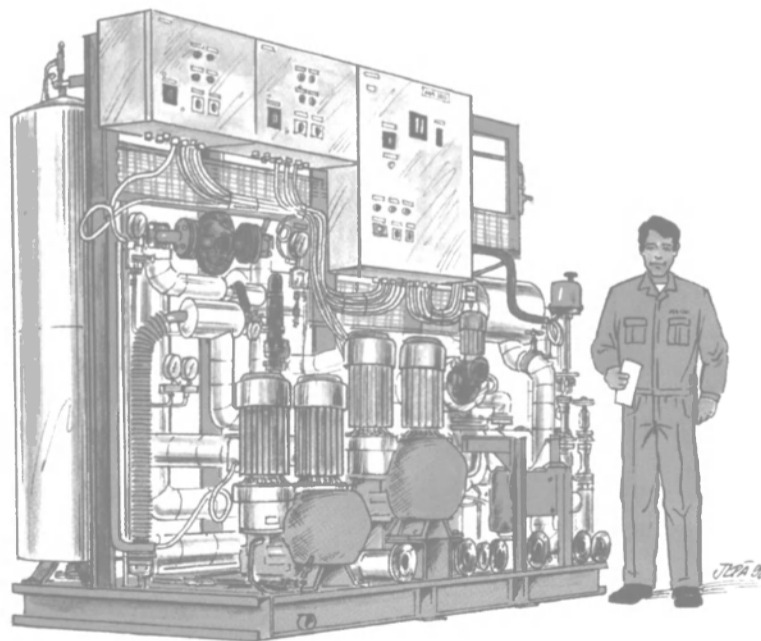
In a sense, Caretaker gives passengers the possibility to help themselves, and even though this type of situation may be cause for alarm — the risk of panic is reduced considerably.

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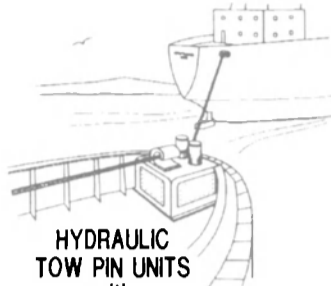
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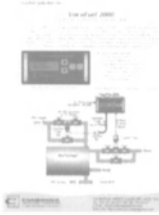
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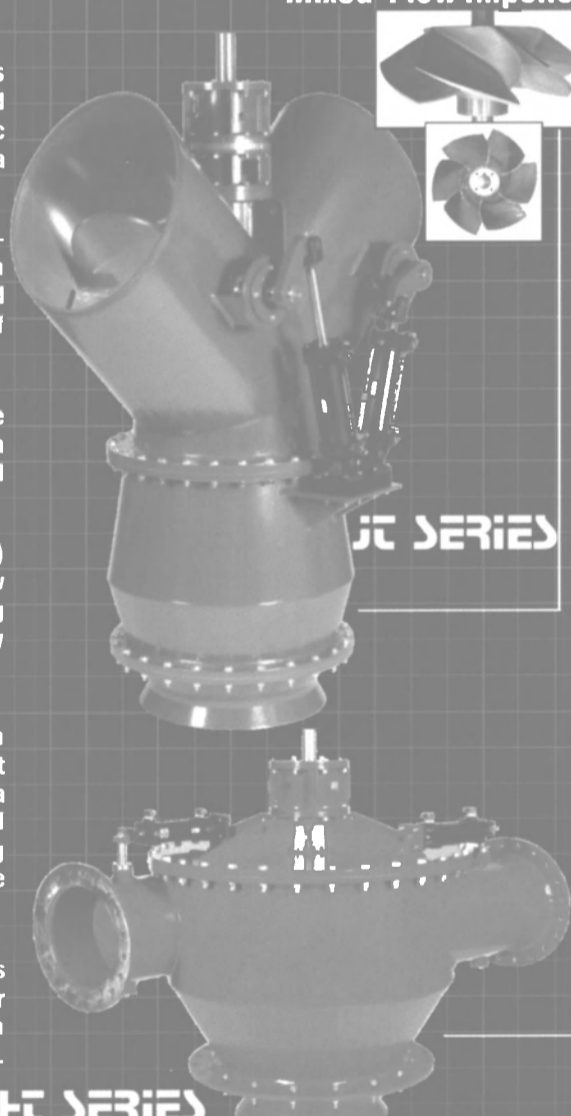
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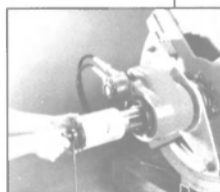
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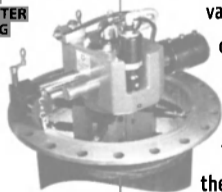
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Ship's Store: Fuels & Lubes

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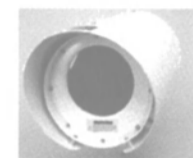
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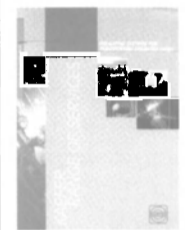
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Pawling Corporation Offers Revised Product Guide

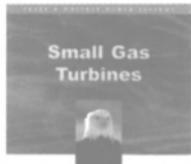
With a wide range of plastic and rubber extruded profiles and fabrication technology, a custom mixing capability and advanced sealing systems, Pawling Corporation is offering an updated guide to equipment, manufacturing and product selection. **Circle No. 112**

Rolls-Royce Offers Integrated Solutions

Rolls-Royce's marine capabilities are organized into several market segments so that a customer's particular needs can be directly addressed by specialist teams in terms of vessel design, engines, propulsion equipment and deck machinery. A market-driven approach also benefits ship operators by offering dedicated solutions for integrated system packages and through-life



product support. Rolls-Royce effectively becomes a customer's worldwide partner for its marine solutions, from concept to complete life-cycle support through the company's global service network. **Circle No. 199**



Pratt & Whitney's Turbines are Small, Yet Efficient

Pratt & Whitney's small turbines are characterized by high efficiency, light weight and small size. They all feature free power turbines, which make them suitable for driving variable power fixed

speed loads, such as generators, as well variable speed mechanical loads such as pumps, compressors and propellers. **Circle No. 117**



Deerberg Stands By Its Green Ship Philosophy

Deerberg Systems, Oldenburg, Germany, a supplier of complete waste handling systems onboard cruise vessels, has together with Safetec GmbH, developed a fuel gas cleaning system. The company stands by its Complete Green Ship Philosophy 21 for the utmost in waste management. **Circle No. 118**

Circle No. 118

Climax Provides Cost Effective Repair Options

Climax's line of more than 25 machine tools provides effective solutions for repairs at sea and valuable alternatives to costly off-site machining in ship repair or refurbishing operations. Contact Climax for complete information on these tools and an unlimited range of custom tool designs for unique repair applications. **Circle No. 121**



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Brookfield's Rheometer Provides Control

The Brookfield R/S Rheometer offers both controlled rate and controlled stress measurement. The R/S Rheometer is designed to accommodate the high throughput required of quality control laboratories. It also offers the sophisticated flexibility required of research environments. **Circle No. 125**



The R/S Rheometer provides cost effective, worry free operation for a variety of laboratory applications. **Circle No. 125**

ShipConstructor



Albacore Research Produces ShipConstructor

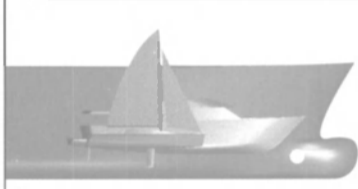
ARL develops ShipConstructor, an integrated suite of ship production software, consisting of the four modules ShipCAM, CAD-Link, NC-Pyros, and ShipReport.

ShipConstructor utilizes AutoCAD and Microsoft Access, which drastically reduces training requirements, for creating a complete 3D product model, minimizing re-work, improving product quality and therefore helping to save money, because the job is done right the first time. **Circle 198 on Reader Service Card**

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Giant Industries Introduces Its Bentonite Pump Line

Giant Industries has launched its line of Bentonite pumps, used for transporting the Bentonite fluid used in the stabilization of bore holes in horizontal boring applications. These pumps range from up to 18.5 - 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.

Circle 2 on Reader Service Card

WWL Signs With Autoship

Autoship Systems Corporation (ASC) has entered into contract with Wallenius Wilhelmsen Lines (WWL) to develop the functional specification of the next generation stowage planning system (SPS) for PCTC, PCC, RoRo, and RoRo/container ships. SPS will act as an industry pioneer, bringing together front end and back end e-commerce systems.

Pacific Fishermen Names GM

Pacific Fishermen of Seattle, Wash. has elected **Doug Dixon** as general manager and shipyard director. Dixon, who has been an active ship surveyor and licensed naval architect and naval engineer in the State of Washington, brings 28 years of experience in the marine marketplace to Pacific Fishermen. The yard's capabilities include that of repair, maintenance and major conversion of vessels including tugs, passenger cruise charter boats and yachts, as well as traditional fishing vessels.



Coffin Turbo Pump Expands

Coffin World Water Systems (CWWS), manufacturer of water treatment, purification and recycling systems, has acquired the assets of Separation and Recovery Systems, Sarex Inc. CWWS is a wholly owned subsidiary of Coffin Turbo Pump of Englewood, N.J.; Sarex specializes in the design and manufacture of oily water separators, as well as lube and fuel oil filter for the marine industry. Established in 1972, the company was one of the early pioneers in developing oily water separation tech.

Circle 7 on Reader Service Card

McGrath Establishes MML

Tom McGrath has established McGrath Maritime Link, Inc. (MML), an independent contractor designed to represent leading marine companies with outfitting and associated products and services. Clients of MML include Hopeman Brothers, American Sprayed Fibers, Hiller Systems, Turnbull Enterprises and Workspace Commercial Fur-

nish-
ings.

Additionally, MML offers consulting services to ship owners, operators and other marine clients.

Circle 33 on Reader Service Card

New Safety Regulations Affect Tow Boats

The U.S. Coast Guard Lifesaving and Fire Safety Standards Division has set new safety standards. The main items addressed are drills, instructions and safety orientation, general alarm systems, fire detection systems, internal communication systems and fuel shutoff valves. These regulations will be applicable toward most existing towing vessels. Exemptions are permitted for certain vessels used only within a limited geographic area, used solely for restricted service (such as making up or breaking up larger tows) or used for pollution response. A towing vessel may also be specifically exempted upon approval of a written request to the local Captain of the Port. The new regulations apply to towing vessels that are classed and uninspected vessels by Part 46 of the Code of Federal Regulations. Because of this, the required fire protection equipment is not subject to plan review or inspection for certification by the USCG. Complete details can be obtained from the USCG via phone at (212) 267-1444.

2000 A Good Year for MaK

Caterpillar Motoren GmbH & Co. KG in Kiel, Germany played a large role in the high worldwide demand for marine engines in the record year 2000. Sales of MaK engines were up by approximately 40 percent, the largest order intake in the company's history.

All new MaK long-stroke engine series M20, M25, M32 and M43 were part of this success. The number of M43s sold has exceeded 100, just two years after market introduction. The M32 continues to show its exceptional market acceptance by having sold more than 500 units since its introduction.

The intake of orders during the first two months of 2001 continued the upward trend. This healthy order book has created a solid basis for the increase in Caterpillar Motoren's net sales in 2001. Caterpillar Motoren won an order for four diesel engines type 6 M 43 with

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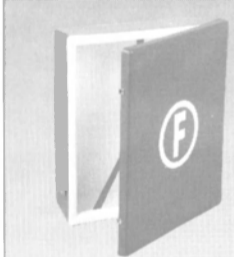
The engines will provide propulsion to the world's largest anchor handling vessel and will be delivered in September 2001.

Caterpillar Motoren will also supply each of seven 2,500 TEU containerships with three MaK 8M 25. These ships will be built by SSW Fahr-und Spezialschiffbau GmbH, for E.R.SCHIFFFAHRT GmbH & Cie. The engines will provide auxiliary power and will be delivered starting in August 2001.

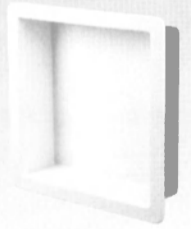
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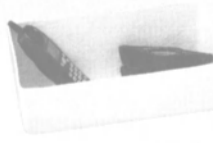
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Stratos Appoints Two EVPs

Stratos appointed **Richard P. Halka** as executive vice president and CFO, and **David J. Oake** as executive vice president of Corporate Development.

Halka was vice president, acting CFO and European Finance Director with Euronet Worldwide, a company in the arena of electronic financial transactions. Oake was vice president of corporate development of Aliant Inc., Stratos' main shareholder, and has been a director of Stratos since 1998. He will be responsible for Stratos' corporate and business development strategy, including all merger and acquisition activity.

Leon Joins Crowley

Mario Leon joins Crowley Logistics transportation management as director of Business Development. The new transportation management center in Miami, Fla. is designed to help customers achieve cost reductions and service efficiencies by taking an integrated approach to all segments of domestic and international transportation. Leon has more than 25 years of experience in the transportation industry, specializing in the Latin American, Caribbean and South Florida markets. During his career he worked in a number of executive management positions for companies including Carotrans International and Equipsa, Inc.

OOCL Announces New North American Headquarters

Effective April 2, 2001, OOCL's North America headquarters will relocate from Pleasanton to San Ramon, Calif. While all e-mail addresses will remain the same, the company's new address is as follows: OOCL (USA) Inc., 2633 Camino Ramon, Suite 400, P.O. Box 5100, San Ramon, CA 94583, Phone: (925) 358-OOCL (6625); Fax: (925) 358-6600

Iridium Satellite Launches Global SatCom Services

Iridium Satellite kicked off the commercial launch of its global satellite communications services at a press conference on March 28. The company plans to launch data services, including dial-up access and direct Internet connectivity, in June 2001, followed by short burst messaging services, which are expected to be available later in the year. Estimated retail costs for the Satellite Series 9500 are less than \$1,000 and airtime rates are expected not to exceed more than \$1.50 per minute, with no additional long-distance, roaming, or zoning charges. Former Iridium customers that own phones can contact a service provider to upgrade them for data-readiness, quality voice enhancements and immediate voice service.

ICCL Cruise Line Adopts New Mandatory Safety Standards

Members of the International Council of Cruise Lines (ICCL) have unanimously adopted mandatory safety standards that exceed existing U.S. and international standards for their cruise ships. The adopted safety standards represent the beginning of a process that will address all of the standards that were originally proposed in February 2001 by the ICCL Board of Directors. This marks the first time an association of international passenger vessel operators has adopted mandatory industry safety standards.

These new standards have an implemented deadline of July 1, 2001. The standard includes the existence of a personal flotation device (PFD) for each infant carried onboard every ICCL member cruise ship. This PFD is designed to provide increased safety and comfort for children not large enough to fit into a child lifejacket. Also required are adult lifejackets onboard each ship in excess of the number required by U.S. and international regulations. In addition, an obstruction-free, suitable helicopter pick-up area is required in the case of patient evacuation to a shore-side hospital. The announcement of mandatory standards has drawn favorable comments from regulatory agencies and individuals, including Admiral **James M. Loy**, Commandant of the U.S. Coast Guard.

Sembcorp Marine Acquires A 50% Stake In PPL Shipyard

SembCorp Marine has signed a Sale and Purchase Agreement with PPL Holdings Pte Ltd to acquire a 50 percent equity stake comprising 10 million shares of \$1.00 each in PPL Shipyard Pte Ltd (PPLS).

The purchase consideration, which was reached after taking into consideration the net asset value of PPLS, would be fully paid using SembCorp Marine's internal funds. PPLS, whose business is primarily in oil rig and vessel construction as well as steel fabrication, has recently secured a contract for the construction of two jack-up drilling rigs, each having a value of \$125 million, from Sante Fe International Corporation

with a construction period of 24 months for each rig.

General Thermodynamics Establishes New Location

General Thermodynamics Corp., Plymouth, Mass. has opened a new sales office located at P.O. Box 642, Hampton Falls, N.H., tel: (877) 731-9800. The company, which has manufactured and distributed the BMEP Engine Cylinder for more than 30 years, will continue to maintain its primary manufacturing facility in Plymouth, Mass.

Leica Geosystems Preps For Expansion

Continued internal growth and recent acquisitions have taken Leica Geosystems into new areas. The company is now advancing into its 3-D data acquisition and visualization markets with six market-oriented divisions. The new corporate structure replaces the existing product-based and regionally oriented matrix organization. The corporate officers at the Heerbrugg headquarters in Switzerland will consist of CEO **Hans Hess**; **Christian Leu**, CFO; **Eric Poll**, Corporate Human Resources officer; **Martin Nix**, Corporate Business Development officer; and a chief information officer, who has yet to be named. This corporate management team will be complimented by the six presidents of the new business divisions: **Clement Woon**, Surveying and Engineering; **Bob Morris**, GIS and Mapping; **Walter Mittelholzer**, Industrial Measuring Systems; **Linus Zoller**, Special Products; **Erwin Frei**, New Businesses; and the interim appointment of **Josef Strasser** Consumer Products.

Rasmussen Joins Transas

Transas Marine Limited's Worldwide Headquarters in the U.K. has appointed **Sven Egelund Rasmussen** as director of Sales, Transas Brand Products. Previously as the managing director of S. P. Radio A/S in Denmark, Rasmussen was responsible for driving sales through brand awareness, as well as negotiation of successful OEM partnerships.



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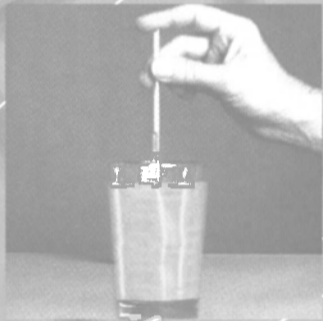
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The Automated American Underpressure System (AUPS) Could Have Prevented 95% of the Oil Spill from the Exxon Valdez.

The American Underpressure System will be tested on a Reserve Fleet US Navy Tanker, USNS Shoshone, with funding from the US Navy's Office of Naval Research (ONR).

The test will take place in the first part of June, 2001 in the San Francisco Bay Area -- California, USA.

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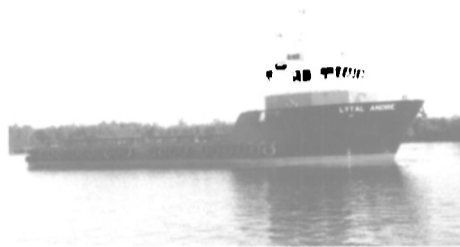
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Bollinger Delivers Second Boat to Lytal

Bollinger Marine Fabricators, LLC delivered Lytal Andre to Lytal Supply Boats. The 146 ft. (44.4-m) oil field supply vessel (OSV) is almost identical to Lytal Ashley, which was delivered last September by Bollinger.



The new OSV measures 145.5 ft. (44.3 m), with a 36-ft. (10.9 m) beam and 11.5 ft. (3.5 m) molded depth. The one specific differentiation between the two boats is that propulsion, electrical generation and bow thruster power in the Lytal Andre is provided by Cummins diesel. Two Cummins KTA-39 MO engines, developing a total of 1,500-hp, drive the vessel through Reintjes WAF561 reverse/reduction gears. Its Schottel bow thruster is powered by a Cummins N14, 360-hp diesel through Twin Disc MG509 reduction gears.

Bollinger Shipyards only recently designed these boats in order to meet and exceed new regulatory requirements, which is less than 100 GT tonnage in the U.S.

Tidewater Receives Three New Vessels

Tidewater Inc. has received its first anchor-handling towing supply (AHTS) vessels specifically designed and equipped for deep-water work. Upon delivery, the two 239 ft. (73-m) KMAR 404 vessels began term contracts at day rates averaging \$23,000 per day. In addition, Tidewater recently took delivery of one additional platform supply vessel (PSV) and is anticipating the delivery of another PSV.

The \$48 million purchase of the two anchor handlers, McNee Tide and Amadon Tide, marks Tidewater's first possession of new deepwater AHTS vessels. While Tidewater has owned four similar anchor handlers acquired from the Sanko Steamship Co., the company will not take full possession of these vessels until they are released from bareboat charters occurring from 2003 through 2006.

Tidewater also received Rigdon Tide, its newest 220 ft. (67.1-m) PSV. The vessel was immediately mobilized to begin a one-year term job at a day rate of \$15,000 per day. In addition, Tidewater is scheduled to take possession of a 73.2-m. UT 755L PSV named Bennett Tide.

Circle 21 on Reader Service Card

AMCV Christens Premiere Vessel In Delta Queen Fleet

American Classic Voyages Co. recently christened the U.S.-flag C/V Cape May Light, the first vessel in its Delta Queen Coastal Voyages' fleet, in an historic ceremony in Alexandria, Va. This is the first christening of a cruise ship in the Washington, D.C. area in the modern era.

The 224-passenger cruise ship will visit ports including Alexandria/Washington, D.C., Baltimore, Annapolis, Norfolk, and many other cities and towns along the U.S. Eastern Seaboard, Great Lakes, and Canadian Maritime Provinces.

The Cape May Light, built in Jacksonville, Fla. by Atlantic Marine, was delivered to AMCV on April 12, 2001. The vessel's accommodations include 113 rooms, with 88 percent outside staterooms, all with modern amenities including TV-VCR units with satellite service and radio, ship-to-shore telephones, and individual climate controls. Boasting Federal-style décor, Cape May Light houses the most up-to-date safety technology.

"We are proud to be holding this historic ceremony at the doorway to our nation's capital. As Cape May Light begins her inaugural voyages to some of the most historic and beautiful coastal cities and towns in our nation, we are thankful to our friends in the U.S. Congress, the Administration and the maritime community whose support for laws like the Jones Act, Passenger Vessel Services Act, and Title XI loan guarantee program help make projects like this become reality. This is truly a momentous occasion for AMCV and the U.S.-flag cruise industry," Philip C. Calian, CEO of AMCV, said.

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Celebrity Cruises Welcomes New Infinity

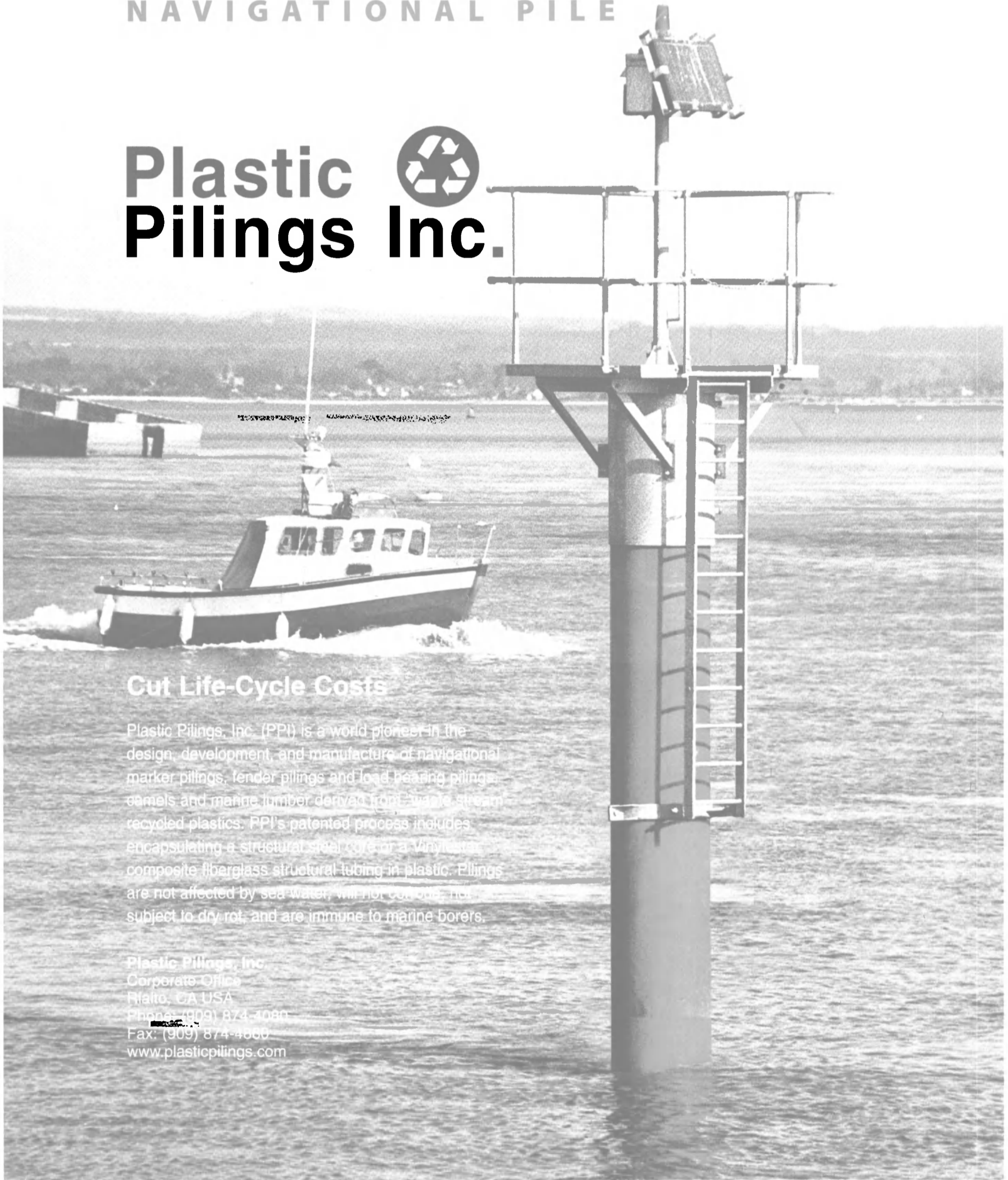
Celebrity Cruises' new Infinity, the newest addition to the cruise line's fleet, sailed into San Diego on April 30, prior to its May 1 call on Los Angeles, where the 1,950-guest Infinity held formal inaugural ceremonies.

One of the vessel's highlights is its SS United States specialty restaurant, which features actual glass panels from the SS United States cruise ship, which launched in 1952 and gained fame for clocking the fastest transatlantic crossing from New York. The SS United States restaurant is Celebrity's second specialty restaurant. Millennium, the first in the line's Millennium-class fleet, features "The Olympic" restaurant, the design of which stemmed from a rare collection of wood paneling that was present in the dining room onboard the R.M.S. Olympic.

Celebrity's Infinity embarked on its maiden voyage, a 14-night trans-canal cruise departing Fort Lauderdale, Fla. on March 3, concluding in San Diego, Calif. The ship then sailed the line's first season in Hawaii, with a series of 10- and 11-night voyages to and from Honolulu and Ensenada.

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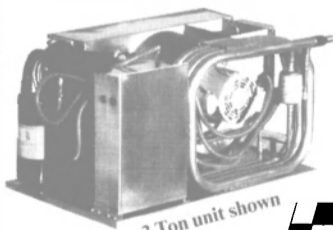
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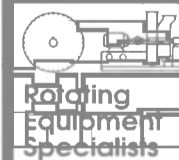
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Name of the vessel: "SAN FRANCESCO DI PAOLA" (Princess Christine)
Type : Roll on/Roll off - Cargo schip
Gross tonnage: 4.030,38 T.
Net tonnage: 1.555,15 T.
Building yard: Cantiera Navale di Terreno Riva Trigoso Italy
Building year: 1964
Length overall: 129,02 m
Width: 17,75 m
Moulded depth: 5,65 m
Displacement at summer draft: 5.250 T
Propulsion: 2 main engines Burgmeister & Wain
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power 3.200 HP/200 rpm each
3 auxiliary engines Burgmeister & Wain

The vessel, moored in the Ostend docks Oosterover, is to view with admission ticket delivered by the above-mentioned office of bailiffs in Bruges, after appointment and on the 21st of May from 10.00 a.m. till 01.00 p.m.

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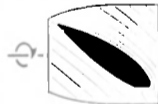
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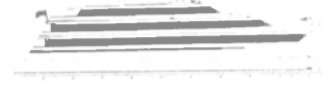
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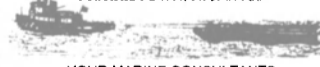
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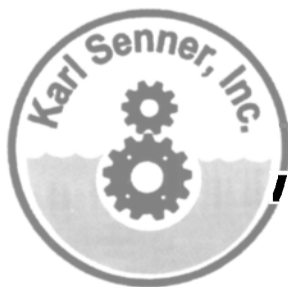
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