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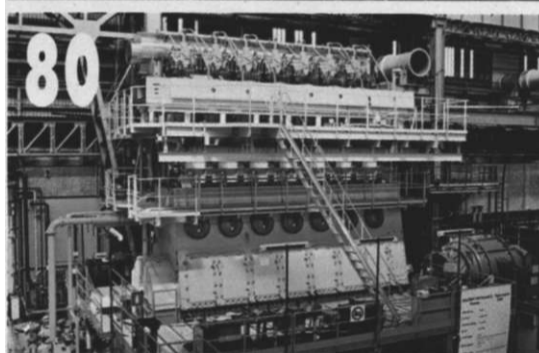
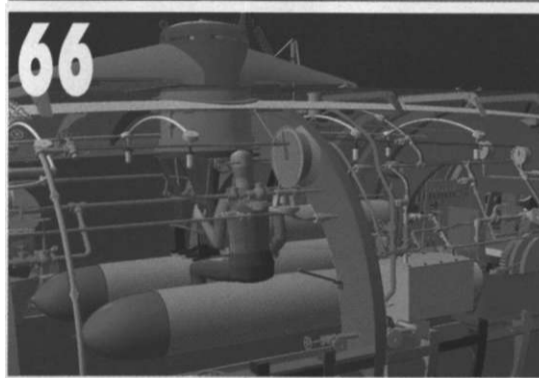
### 66 Something Old, Something New ...

In a relationship that has generated leading CAD/CAM software to efficiently manufacture everything from Boeing 777s to nuclear subs, IBM and Dassault Systemes recently helped to rescue and re-create the original drawings of John P. Holland — the father of the modern submarine.

— By Dr. Edward S. Popko, IBM; and  
Gary McCue, Historian/Naval Architect

### 80 Wartsila Inaugurates Two Stroke

The advent of two-stroke propulsion engines for newbuilds has arrived — and is expected to be the norm in five years' time.



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### VT Finalizes Halter Deal

Vision Technologies Systems, Inc. (VTS) completed its asset purchase of Halter Marine, through its subsidiary, VT Halter Marine, Inc. The new company, VT Halter Marine, Inc. (VTHM), will continue to provide products that have made Halter vessels known worldwide. **Anil Raj**, president and COO of VT said, "We're ready to move on to the next challenge of selecting the projects the new company will undertake. VTHM plans to continue the existing design and construction projects for the U.S. Government. VTHM will also be geared to offer ship-repair services for both naval and commercial vessels." VTHM will headquarter its corporate operations in Gulfport, Miss., with seven facilities located in Pascagoula, Moss Point, Port Bienville, Lockport and Gulfport, which are located along the U.S. Gulf Coast.

### Expensive Break Up

Royal Caribbean Cruises Ltd. confirmed that the Board of P&O Princess Cruises withdrew its recommendation of the merger agreed between the two companies in November 2001. **Richard Fain**, chairman and CEO of Royal Caribbean, said: "Clearly, we regret that the Board of P & O Princess is taking this action." The break up was not cheap for P&O Princess, though, which had agreed to a \$62.5 million break up fee.

### Amer Climbs Out Of Bankruptcy

Amer Reefer Company Ltd, the operator of seven modern reefer vessels, has completed the restructuring of its \$100 million 10.25% bond issue (preferred ship mortgage notes due 2008) placed in March, 1998. The Bond Trustee has confirmed that all outstanding bonds were cancelled for a consideration of \$0.67, (and ownership of the ships has returned to the restructured Company and its shareholders.) At the same time, the New York Court from whom Amer had sought protection under the Chapter 11 Bankruptcy Code in March, 2001, confirmed that all proceedings against the Company have been withdrawn and all obligations discharged and Amer Reefer has emerged from Chapter 11.

\$43 million has been provided by a syndicate of banks headed by Nordea Bank, Oslo, to finance the emerging owning structure upon cancellation of the Amer Reefer Notes. Protracted litigation and negotiations have taken place via the New York Court and Judge

**Arthur Gonzales**. Additional sums required to cancel these notes, including interest paid since July 2002, are estimated to aggregate nearly \$46 million. Mandate Shipping, owners of 100% equity in the Amer Reefer Co), will convert the 33% of the bonds it holds in Amer, into equity in the company.

### The \$5 Billion Market

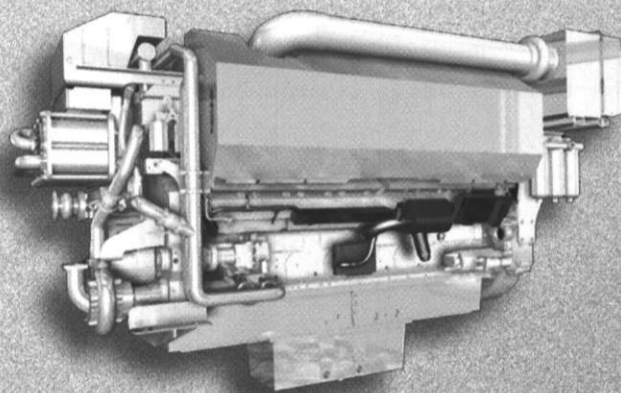
Marine propulsion systems are expected to grow to become a \$5 billion market by 2007, according to a new study The World Marine Propulsion Report, by analysts Douglas-Westwood. Over the next five years vessel tonnage delivered by yards is expected to increase by

four percent while vessel numbers fall by 10 percent. However, total propulsion power should increase by eight percent when compared to the 1997-2002 period. T "We expect that there will be an increasing market share for Chinese shipyards, mainly at the expense of Japanese yards. "Amongst the engine

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## Editor's Note

Manhattan's University Club served as the setting for a Marine Money-sponsored financial conference, an event that attracted some of the world's leading ship owners, financiers and legal minds to New York City to discuss opportunities in the U.S. Most of the talk centered on the blue-water, deep-draft end of the market, and was financially orientated (except for **Jack Berglund** of Davie Industries, introduced as the "lone engineer" on the speaker roster to the bemusement of the 150 in attendance. Jack had some interesting news from Canada, specifically a discussion on financial aid available from the Canadian federal and provincial powers — aid geared to luring ship construction projects up north ... but that will be covered in the December edition!).

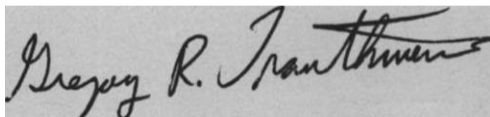
In a broad perspective, Maritime Administrator **William G. Schubert** provided a forthright breakdown of the current status and future direction of the U.S. maritime market. He gave strong emphasis to the near- and long-term prospects for developing U.S. short sea shipping corridors to ease traffic in particularly congested areas (i.e. I-95). Almost as a sidenote, he mentioned that, on the international playing field, the U.S. builders of tugs and offshore service vessels are arguably the most price competitive players in the U.S. vessel building stable.

The U.S. medium-sized shipyards are, indeed, competitive internationally, as you will see upon reading this edition. While skeptics often earn the larger headlines in our "bad news is good" society, a diversity of boatbuilding facilities, in all corners and on all coasts, are increasingly developing more technically complex, cost-efficient, world-leading boats of every shape and size. Increasingly, U.S. builders are forging international alliances, such as Bender Shipbuilding's collaboration with Austal, and Bollinger Shipyard's hook-up with INCAT. Both entities are fighting hard to win commercial and military contracts, and both are succeeding.

But the success does not end there.

Every day, across my desk, comes news of another innovation from some corner of the country ... an innovative Z-drive tug being built at Washburn & Doughty to serve the booming LNG market... an advanced patrol boat application from SeaArk to serve burgeoning coastal defense needs ... the list is endless.

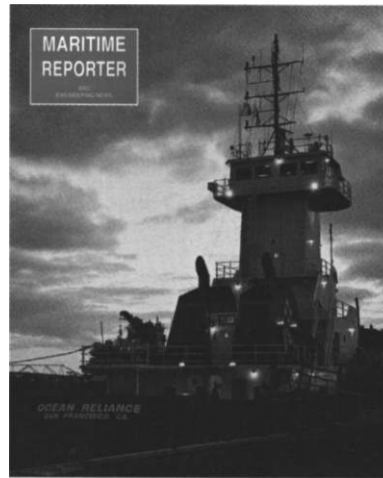
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## On the Cover



This month's cover is of Ocean Reliance, an innovative new ATB built by Marinette Marine. Please turn to page 36 for complete coverage on this innovative vessel.

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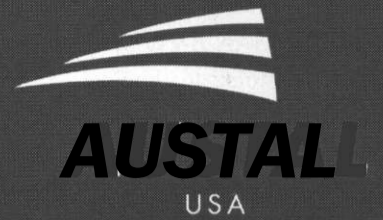
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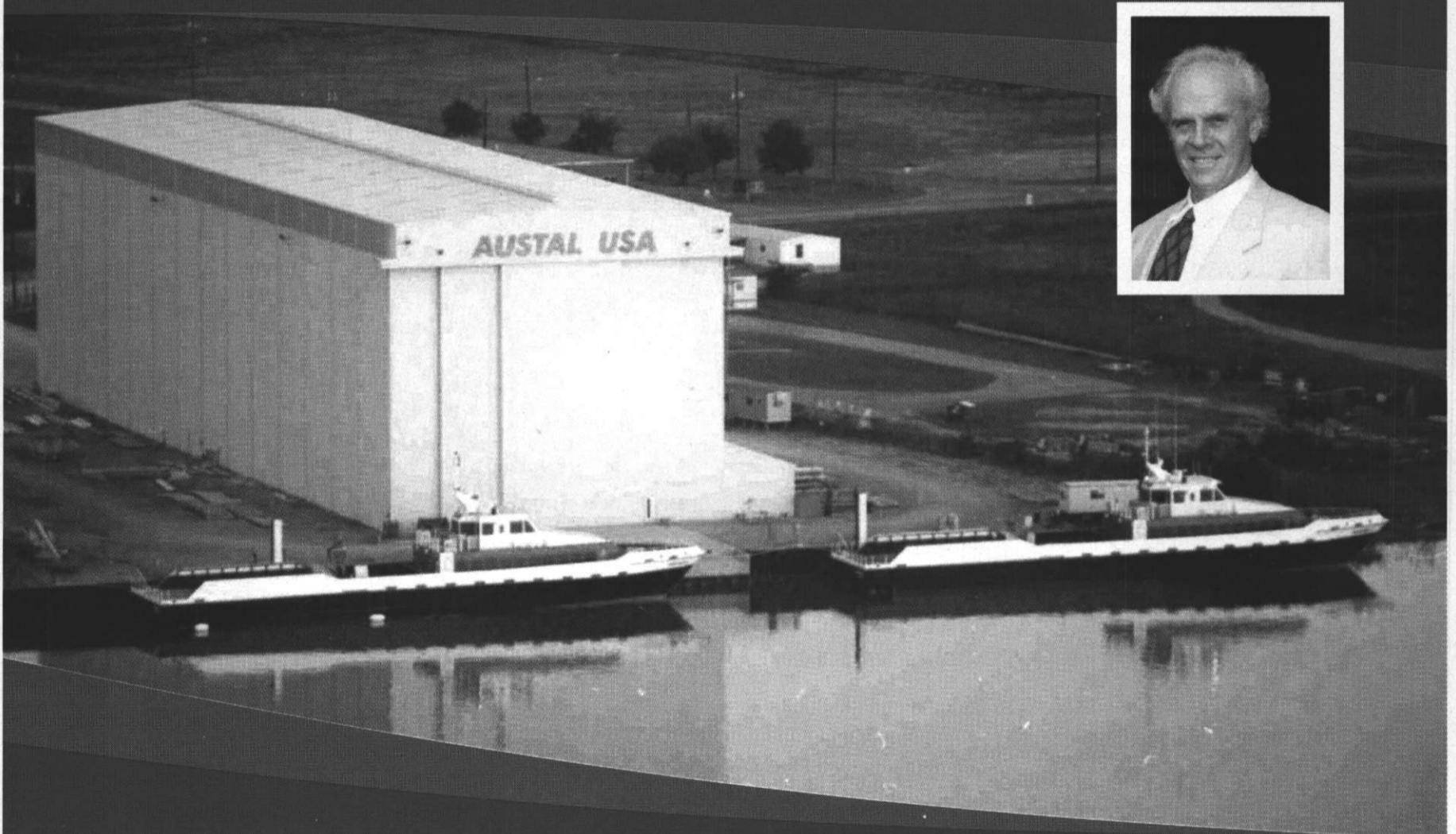
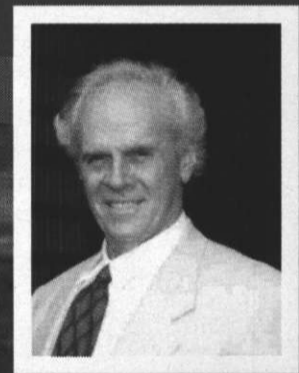
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## News

makers we expect MAN/B&W along with Wartsila to continue to dominate and also that Caterpillar will hold its market share."

### EU Takes Case to WTO

The EC has requested the World Trade Organization (WTO) to set up formal

consultations under its Dispute Settlement mechanism over the unfair Korean shipbuilding practices. The EU and S. Korea have been battling the subsidy issue for many years, with EU alleging subsidies are effectively destroying the European shipbuilding sector, while S. Korea denies their existence.

### Bollinger Restructures Management Team

Bollinger Shipyards, Inc., has promoted and/or assigned new responsibilities to the following members of its management team. **Mike Ellis** has been promoted to executive vice president and COO of the company. Ellis joined Bollinger in

1998 as CFO and will now be responsible for the overall operations of the company. **Walter Berry**, formerly COO, has joined Bollinger/Incat USA, a strategic alliance between Bollinger Shipyards, Inc., and Incat Australia Pty. Ltd. to market and build high-speed aluminum catamaran ferries and transport ships for U. S. commercial and military markets. **Ben Bordelon**, formerly special projects coordinator, has been promoted to executive vice-president, repair. **Cathy Green**, who joined Bollinger in 1999 as corporate controller, and later became vice-president, controller and treasurer, is now vice-president, CFO and treasurer. **Craig P. Roussel**, vice-president, corporate operations has assumed responsibility for environmental affairs and compliance as well as the ISO department. He retains responsibility for procurement, corporate foreign trade zone operations, tax incentives and related services. **Doug Taylor**, formerly director of human resources, has been named vice-president, human resources.

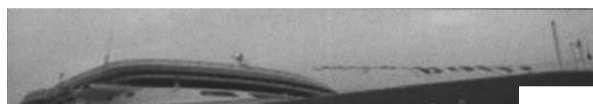
### Savannah Delivered

Bollinger Shipyards, Inc. delivered Savannah, a 4,000 hp, Z-Drive tug, to Crescent Towing. Savannah is Crescent's 24th tug overall, and the company's second Z-Drive tug. Savannah measures 96 x 34 x 14.7 ft. (29.2 x 10.3 x 4.4 m), and is powered by a pair of Caterpillar 3516B's driving two Ulstein 1650H Z-drives. **Ed Bazemore**, Crescent Towing vice-president and port manager in Savannah, Ga., said "Upon her arrival she will be used to work LNG and container ships."

### IMO Considers Liability Issues for Passengerships

At press time the IMO was meeting to consider the adoption of a protocol to amend the Athens Convention Relating to the Carriage of Passengers and their Luggage by Sea, 1974. In opening remarks, IMO Secretary-General **William O'Neil** stressed the crucial importance of a successful outcome to the Diplomatic Conference meeting this week and next at IMO to amend the liability regime relating to damage suffered by passengers on international voyages. He continued that the successful adoption of the protocol would ensure that all those likely to be affected by a shipping incident will receive prompt and adequate compensation based on internationally accepted criteria.

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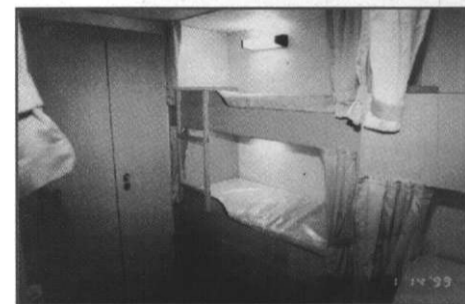
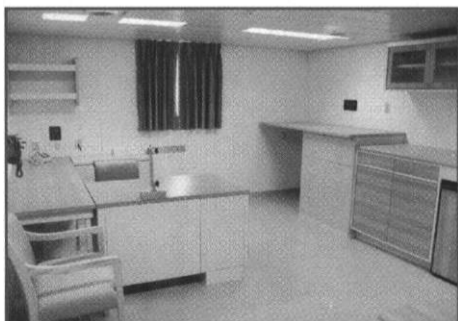
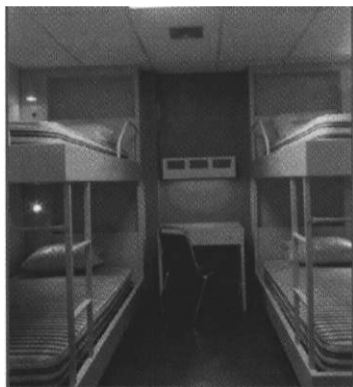
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## News

### AMFELS Delivers Rig

AMFELS Inc. delivered on time, and on budget, a KFELS MOD V "B" class ultra premium jack-up drilling unit to a subsidiary of ENSCO. ENSCO 105 is the second MOD V "B" new generation deep-well drilling rig that has been completed. The total cost of construction and

outfitting for the ENSCO 105 was in excess of \$100 million, of which work performed by AMFELS formed a major portion. The first KFELS MOD V "B" was Chiles Discovery (now renamed ENSCO 104) built and delivered by Keppel FELS in Singapore in March this year, and currently deployed in the

Bayu-Undan field in Timor Sea for Phillips Petroleum Company.

### Incat Confirms U.S. Military Contract

Incat has confirmed a contract with the U.S. Military. Military Sealift Command, Washington, D.C., is the contract-

ing arm that will lease the craft from Bollinger/Incat USA, LLC, Lockport, La., to support U.S. Navy Mine Warfare Command. The craft will be developed from a part built commercial vessel (Incat Hull 061) currently under construction at the Hobart, Tasmania shipyard with delivery of the vessel to Ingleside, Texas in June, 2003.

Incat's U.S. Military Project Manager Nick Wells said: "Once commissioned, the vessel is expected to serve as an interim replacement for the U.S. Navy Mine Countermeasure support ship Inchon. The craft will also serve as a platform to conduct a series of limited objective experiments, exercises, demonstrations and training events determined by the Navy Warfare Development Command and the Marine Corps Combat Development Command."

The ship will be capable of maintaining an average speed of 35 knots or greater, loaded with 500 short tons, consisting of 350 personnel and military equipment. A minimum operating range of 1,100 n.m. at 35 knots, is required by the contract, as is a minimum transit range of 4,000 n.m. at an average speed of 20 knots.

### President and Proprietor of TOTE Passes Away

Robert B. "Bob" McMillen, born July 10, 1935, died October 12, 2002 at his home in Bellevue, Wash., following an extended illness. "There were three very distinct things that marked Bob's life," said Mike Garvey, who, along with Bob and other businessmen, purchased Totem Ocean Trailer Express 20 years ago in October, becoming Totem Resources Corporation, then SaltChuk Resources. "First, he was totally committed to the business," referring to Bob's 17 years as TOTE's president until 1993 and executive of TOTE's holding company until his death.

"Bob understood that you only succeed by working with other people," said Stan Barer, another 20-year owner of TOTE. "He was an eloquent man; maybe not in speeches and such, but if you watched what he did, you didn't care what he said."

### Carnival Takes Conquest

Carnival Cruise Lines took delivery of the 110,000-ton Carnival Conquest. Billed as the largest "Fun Ship" ever constructed, the Carnival Conquest's official ceremonies were held at the Fincantieri shipyard in Monfalcone, Italy.

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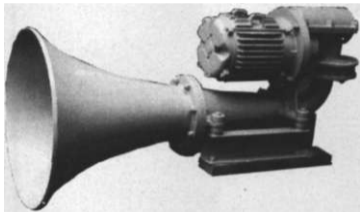
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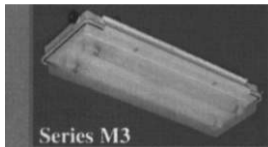
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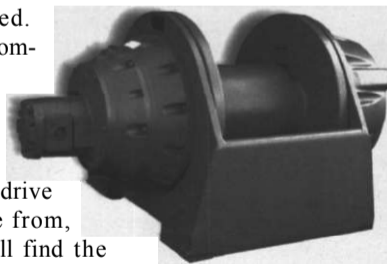
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Carnival Conquest is the first in a new series of ships for the line and becomes the 18th vessel in the Carnival Cruise Lines fleet. The 2,974-passenger Super-Liner will depart Italy on a 16-day transatlantic crossing in late October.

### TEN Takes Pentathlon

Tsakos Energy Navigation Limited (TEN) has taken delivery of the Pentathlon, the third in a series of four new double hull suezmax tankers. The company said a major Russian oil company has employed the vessel on a repositioning voyage. TEN is scheduled to receive the fourth suezmax sister ship, the Triathlon, before the end of 2002. "TEN continues to build one of the youngest and most efficient oil tanker fleets in the world," said **Nikolas P. Tsakos**, president and CEO. "The Pentathlon represents the continuation of our fleet's full transition to safe and efficient double-hulled vessels.

### Northrop Grumman and Kockum/HDW Partner Up

Northrop Grumman Corp. has signed a cooperative agreement with Kockums AB and its parent company, Howaldtswerke Deutsche Werft AG (HDW), under which Kockums will join a team assembled by Northrop Grumman's Ship Systems sector to compete for the U.S. Navy's Focused Mission Vessel Study. This study is expected to result in the development and construction of a Littoral Combat Ship (LCS), one element of the DD(X) family of surface combatants planned for construction by the Navy during the next quarter century.

### Kvaerner, RGI to Establish Yard Joint Ownership

Aker Kvaerner and Aker RGI have entered into an agreement to establish a joint ownership for their wholly owned shipyards in Germany, respectively Kvaerner Warnow Werft and Aker MTW. Among other conditions, the agreement is dependent on approval from Aker Kvaerner's and Aker RGI's lenders. The aim is to implement the new ownership by the end of 2002. Aker Kvaerner will own 40 percent of the two yards. In Finland improvement initiatives continue at Kvaerner Masa-Yard's facilities at Helsinki and Turku. The two yards have already improved their operation, with positive results so far this year. At present the yards are engaged in the construction of four cruise-ships. The Norwegian owner Color Line

recently confirmed an agreement of intent for a new cruise-ferry order for delivery in 2004.

### Kirby Buys Coastal Boats, Barges

Kirby Corporation signed an asset purchase agreement with Coastal Tow-

ing, Inc. to purchase seven black oil tank barges and 13 inland towboats.

The transaction, estimated at \$17.1 million in cash, is being financed through Kirby's operating cash flow and available credit under Kirby's bank revolving credit agreement. Kirby and Coastal have also entered into a Barge Management Agreement whereby Kirby

will serve as manager of the combined black oil tank barge fleet, which will include Coastal's 51 remaining barges and Kirby's 65 barges, for a period of seven years. In a related transaction, on September 25, 2002, Kirby purchased from Coastal three black oil tank barges for \$1.8 million in cash.



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# Promoting A Modal Shift

The actual extent of European public funding to promote a modal shift from road to waterborne transportation has up until now — been far outweighed by political discourse on the subject — no doubt designed to appeal to the popular, environmentalist vote. However, a recently more pragmatic approach by government to the issue, coupled with the maritime industries' development of new technical solutions for efficient, intra-regional freight exchange, suggests that the tide might be turning in favor of short-sea shipping.

An appreciation that economic and environmental considerations are increasingly intertwined, and that environmental performance bears more and more on competitive position, colors new initiatives on the part of both industry and more enlightened or commercially circumspect governments.

The need to act is urgent. On current forecasts, movement of goods by road within the European Union is projected to grow by around 40-percent up to 2010. In an effort to lessen some of the expected downsides of such growth, with its implications for congestion, pollution and accidents, the EU has formulated the Marco Polo aid program. This has been designed to give financial sup-

port to projects judged to potentially improve Europe's freight transport system from an environmental perspective.

The Marco Polo initiative provides an important backcloth to a new, Anglo-Spanish project, which blends high-speed vessel design and construction know-how with powering arrangements based on the latest marine derivative of aero gas turbine technology. Acknowledging the preoccupation among shipping service operators with running costs and dependability, the accent in the development of the European High-Speed Cargo Vessel (EHSCV) concept by IZAR and Rolls-Royce has been on operating efficiency as well as reliability, besides power density.



There have been quite a number of innovative, fast freight carrier design proposals over the past couple of years. However, new investment in high-speed solutions over this period has been

largely concentrated on ferry design families and shipbuilders with an established track record in the field.

Through legacy company Bazan, IZAR's experience in building three Mestral-class monohull ferries of 35 knots, plus the 40-knot monohull Alahambra, and a 57-knot B60-type catamaran, stands it in good stead. The proposed 37-knot EHSCV, embodying all

high tensile steel construction in preference to the aluminum structures used before, offers a payload equivalent to 1,700 lane-m, or 124 trailers, with a length of 692 ft. (211 m); breadth of 72 ft. (22 m); and draft of 15 ft. (4.7-m). The MT30 gas turbine scheduled for commercial release by Rolls-Royce in early 2004 is central to the proposition. Two such units, rated for the application at 32,000-kW apiece, and fuelled by marine diesel oil, would drive two or four Rolls-Royce Kamewa waterjets.



by David Tinsley, technical editor

Prototype testing of the MT30 started in September this year at Rolls-Royce's Bristol premises in the U.K. Since the machine has 80-percent commonality with the Trent 800 aero engine, its pedigree is impressive. The Trent 800 has logged more than 2-million flying hours since service entry in 1996, and is claimed to have achieved a 99.9-percent dispatch reliability. The question now is whether the MT30, will be viewed as a viable powering option by the marine market.

Certainly, though, the figures for the EHSCV design are appealing. Relative to road transport routings, and with reference to the EU's own calculations of road freight costs per km., IZAR and Rolls-Royce say that the new-generation freight carrier will be competitive for routes over 300 n.m. Early feedback from operators has been such that consideration is already being given to a possible version of the design incorporating overnight accommodation for a limited number of truck drivers.

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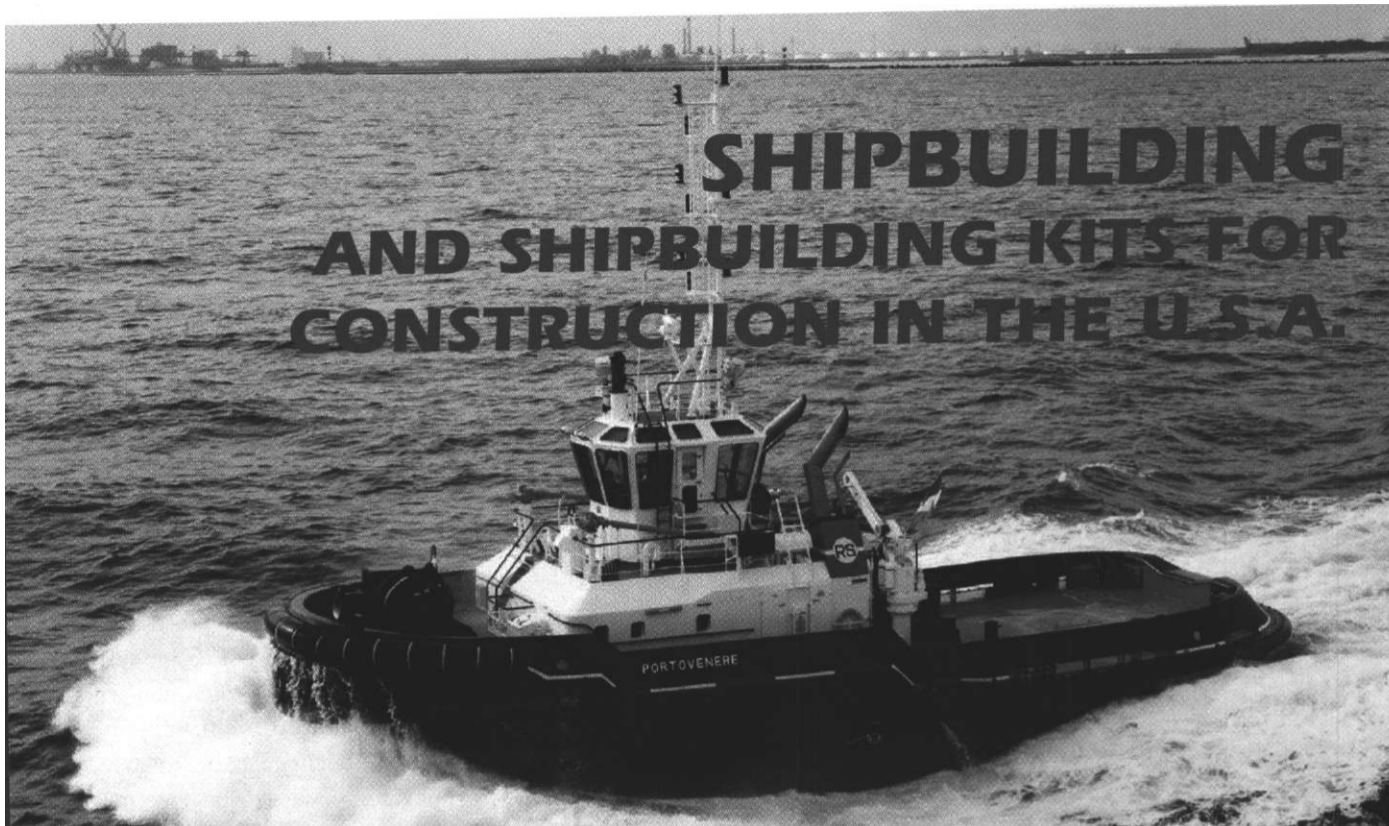
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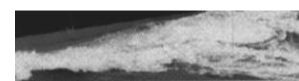
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## Investment in Design • By David Tinsley

Under the Marco Polo program, subventions of up to 30-percent can be made towards operating costs over three years for approved projects, while start-up grants are available for schemes involving two or more member states. The aid can be additional to individual member state support.

Meanwhile, Spain's Shortsea Promotion Center is encouraging the Spanish government to give direct backing to national operators launching new coast-wise and shortsea services.

IZAR's commitment to the ferry sector as a whole is clear from its ongoing involvement in construction of full-displacement vessels for the international market, in its research and development work, and in its endeavors to resume production in the commercial high-speed field. Besides the EHSCV, its current offering to the high-speed market includes a Pentamaran RoPax design formulated in cooperation with the British technical consultancy Nigel Gee & Associates (NGA).

### Lifecycle Toolset

Shipbuilding market demand for software tools, which can bring about true

integration between the various disciplines and processes, is driving the development of a new generation of computer-aided design (CAD) systems. Many shipyards cite shortcomings in the functionality of CAD-based technology used today as a barrier to concurrent engineering, while the lack of a common information base inhibits improvements in design workflow and ship life-cycle processes.

Breakthrough technology championing a data-centric, integrated 3-D modeling approach encapsulated in Intergraph's new IntelliShip software is claimed to surpass current CAD-based solutions. One of the most important facets of the package is its ability to address conceptual and detail design of ships and components, in addition to plan approval, production planning, manufacturing, construction and risk management, giving credence to its description by its American developers as a "lifecycle toolset." Whereas "traditional" CAD systems can answer only graphic-related questions, IntelliShip's fully-integrated approach provides a basis for cost calculation.

"The (shipbuilding) industry's productivity is tied to, and limited by the use of

traditional CAD technology, which is expensive to implement and maintain," contends Intergraph, adding that "Lack of integration prevents the efficient transition of early design to downstream detailed design, and increases man-hours and cost due to rework. It can also place the shipbuilder over budget by the time the contract is awarded."

To reduce man-hours, the software permits high-level design decisions to be propagated automatically to detail parts, while the rule-based automation it incorporates eliminates repetitive operations in detail design. By obviating many of the sequential dependencies of the traditional design process, IntelliShip is intended to cut design, procurement, fabrication and construction times. At the core of IntelliShip is its Product Model Database structure, providing full access to engineering data, capturing graphics and associated information as well as design intent. The database is a shared, common repository for all ship design, construction and management information.

Due for release early next year, IntelliShip has been formulated by the process, power and offshore division of Intergraph with the assistance of Global

Research & Development Company (GRAD), a U.S.- headquartered consortium of international shipbuilders. As part of a five-year pact signed by

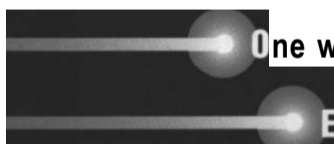
Intergraph with Oslo-based Det Norske Veritas Software, relating to software for the shipbuilding, offshore and process industries, products built on IntelliShip technology will be resold by DNV Software into the shipbuilding market. These will constitute part of a broader suite of systems marketed as the DNV Software Marine Solution.

Intergraph is a leading vendor of software and associated services in the process and power generation industries, and also has a stake of around 35-40 percent in the offshore sector. IntelliShip signals the U.S. firm's ambition to capture 40-percent of the shipbuilding market within five years.

Under the terms of the long-term deal signed with Intergraph, DNV Software will also integrate DNV Nauticus and IntelliShip applications, and collaborate with the US company in the offshore oil and gas and process sectors. Meanwhile, the GRAD consortium is testing IntelliShip on ship design and production projects at member company yards in Europe and Asia.

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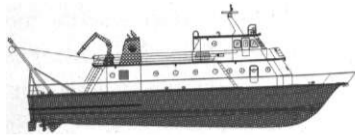
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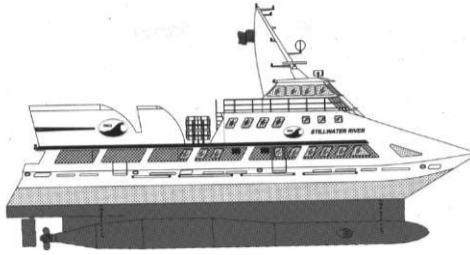
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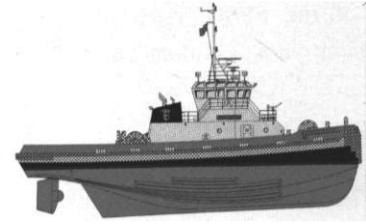
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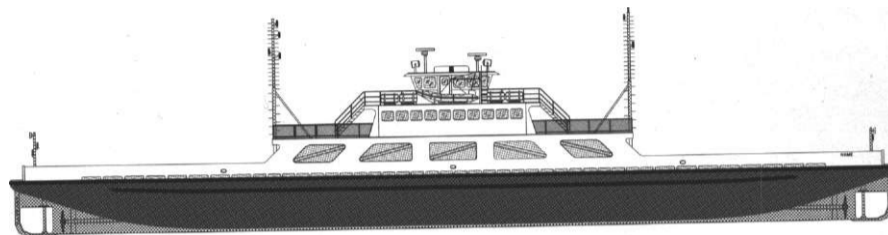
96' Research Vessel



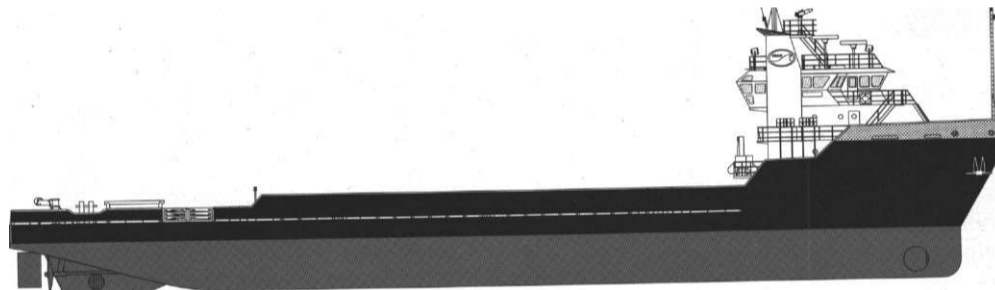
120' Aluminum SWATH



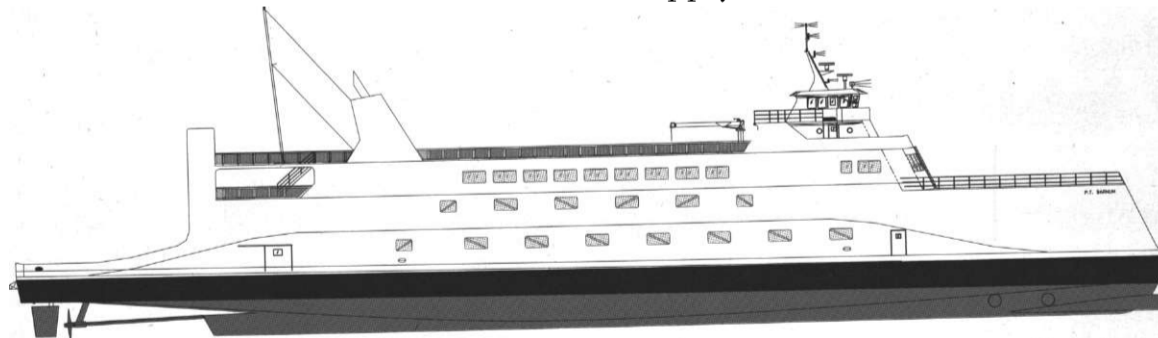
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## FPSO Farwah Launched at Fene Yard

The 900,000-bbl FPSO Farwah, to be operated in offshore block CI37, 100 km offshore Libya, was launched at IZAR's Fene yard in October.

Construction of the FPSO 'Farwah' was started at Fene yard less than one

year ago, after in mid-2001 Antwerp-based Exmar Offshore was contracted to supply the FPSO on a leased basis to CPTL and to manage production operations.

As regards 137-B, Fene is responsible for the design, engineering, and construction of the hull, as well as the engi-



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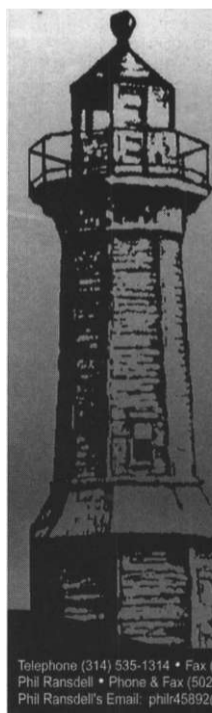
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neering interface with the turret and top-sides modules. It has also manufactured certain equipment items for the engine room and deck, in association with other IZAR yards in Spain.

As Project Manager Jorge Lopez Novo recalls, "We were first approached about this project in August 2000. At that time, Exmar was focusing on a conversion, at TotalFinaElfs request, although a newbuilding was also an option.

The completed vessel has a length of 689 ft. (210 m), a breadth of 144 ft. (44 m), a depth of 75 ft. (23 m), and a design draft of 54 ft. (16.5 m). When fully laden, it will have a dwt of 147,700 tons; it will also be able to weathervane 360 degrees around its turret.

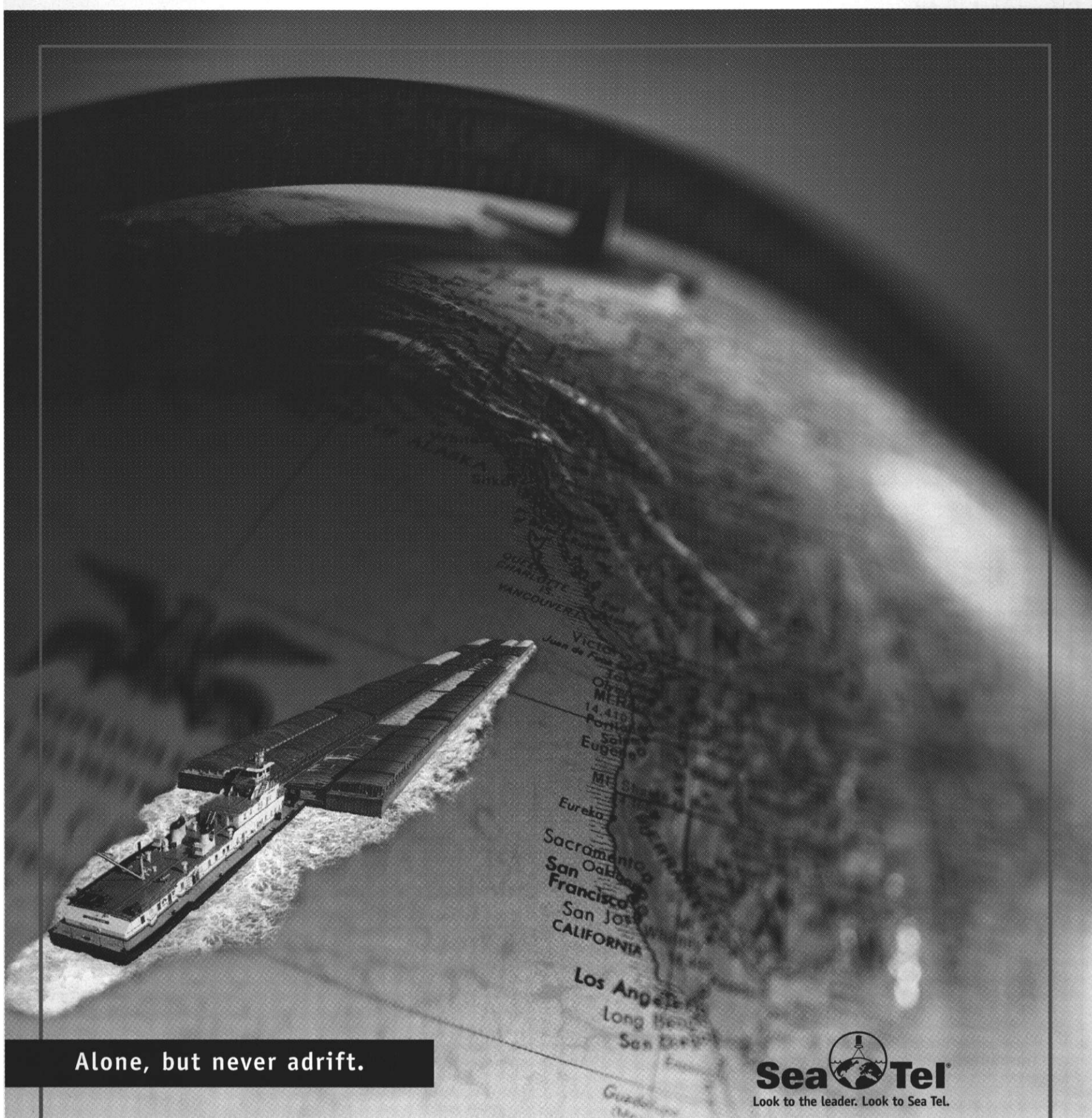
The harsh local environment necessitates strengthening of certain support structures. To aid stability, 197-ft. (60-m) bilge keels are being fitted along the vessel's sides. At the front of the vessel, a high bulwark will be installed to protect the deck from green water.

The work on the vessel is put forth via a team effort with IZAR Fene performing the design and fabrication of the 300-ton hydraulic power module, which is used to drive the offloading pumps; the yard in Cartagena, southern Spain, fabricated the power plant's 3 MW diesel generators; IZAR Manises in Valencia built two, 30-ton cranes for the deck, while Fene built and designed the helideck and accommodation area (enough for a crew of up to 52) and the 30-m flareboom.

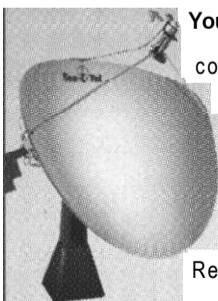
To speed up contracts such as this, Fene recently invested in new workshop areas. It now has two independent fabrication flows (covered floors). Fene also invested \$15 million in two new paint shops dedicated to top coating.

Partners in the development of the offshore block CI37, known as the B structure, are TotalFinaElf, Germany's Wintershall, and Libyan National Oil Company (NOC) with the balance. TotalFinaElf affiliate Compagnie des Petroles Total Libya (CPTL) is operating the project, which is based in 83-87 m water depth, 100 km offshore western Libya.

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# The Irony Of Maritime Security

By Dennis L. Bryant, Senior Maritime Counsel, Haight Gardner Holland & Knight, Washington, D.C.

It now appears that the 107th United States Congress will enact new maritime security legislation during a lame-duck session to be held this month. This is ironic since both Senate and the House of Representatives passed maritime security bills months ago, the two measures were largely similar, and the two houses have been conferencing on development of a joint measure for some time. The purpose of this paper is not to dwell on the issues that delayed earlier passage of the measure. Rather, it is to review what new maritime security measures have been adopted by the various federal agencies utilizing their existing authority.

As with the beginning of U.S. involvement in WW II and the Korean War, the War against Terrorism has started out as a 'come as you are' event. While Congress has passed supplemental appropriations bills, it has been noticeably slow in enacting new legislation intended

specifically to provide new legal tools to reduce the risk of maritime terrorism in the United States. As the world saw on October 6, 2002 with the terrorist attack on the French supertanker Limburg in Yemen, the maritime security threats are very real and can take many guises. Thus far, the majority of actions taken by the federal agencies charged with maritime security missions have been undertaken utilizing old statutory authority. Some measures (including some that have generated controversy), though, have been undertaken utilizing little-noticed provisions found in recent legislation.

#### Old Tools

The U.S. Coast Guard's broad port security authority dates from the Espionage Act of 1917. Port security authority was enhanced with enactment of the so-called Magnuson Act in 1950, shortly after the Korean War began. The Ports and Waterways Safety Act of 1972 expanded the program further, focusing this time on maritime safety issues. The Coast Guard also has responsibility to

'superintend' the merchant marine. The Customs Service has enforced the nation's customs laws since the earliest days of the Republic. The Immigration and Naturalization Service (INS) has broad authority to regulate entrance of aliens into the United States.

#### New Tools

It would be inaccurate to say that, since the terrorist attacks of September 11, 2001, Congress has not enacted any measures that have the effect of enhancing the maritime security of the United States. Five new laws have made their impact felt, even though the measures were not primarily concerned with maritime security.

The *USA PATRIOT Act of 2001* (Pub.L. 107-56), in addition to authorizing enhanced surveillance techniques and broadening the laws relating to illegal money laundering, directed the Department of Justice to implement an integrated entry and exit data system at all ports of entry, including seaports. This measure led to the recent implementation of the National Security



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

Entry-Exit Registration System (NSEERS), under which non-immigrant aliens, including seafarers, from certain nations are required to be photographed, fingerprinted, and interviewed when arriving in the United States. The current list of nationals subject to special registration includes Iran, Iraq, Libya, Sudan, and Syria, plus males between the ages of 16 and 45 from Saudi Arabia, Yemen, and Pakistan.

*The Aviation and Transportation Security Act of 2001* (Pub.L. 107-71), in addition to establishing the new Transportation Security Administration (TSA) and federalizing airport security, provided the TSA with authority to develop policies, strategies, and plans for dealing with threats to transportation security. The TSA is also directed to ensure the adequacy of security measures for the transportation of cargo; oversee the implementation, and ensure the adequacy, of security measures at transportation facilities; and require background checks for transportation security personnel. Subject to the direction and control of the Secretary of Transportation, the Under Secretary of Transportation for Security, during a national emergency, is also charged with coordinating domestic transportation security (including port security).

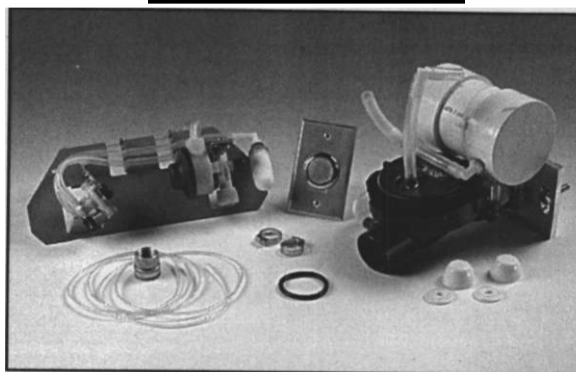
*The Enhanced Border Security and Visa Entry Reform Act of 2002* (Pub.L. 107-173) added the requirement to include crew members on the passenger manifests of vessels arriving in the United States and directed that such

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manifests are to be submitted to the Immigration and Naturalization Service (INS) electronically commencing not later than January 1, 2003. The passenger manifest is to include, where applicable, the alien's U.S. visa number, date, and place of issuance.

*The Terrorist Bombings Convention Implementation Act of 2002* (Pub.L. 107-197) makes it a federal crime for any person on board a foreign vessel in U.S. waters to deliver, place, discharge, or detonate an explosive or other legal device in, into, or against a public transportation system with intent to cause death or serious bodily injury or with intent to cause extensive destruction. Conspiracies and attempts to commit such crimes are also punishable under this Act. 'Public transportation system' is defined to include all facilities, conveyances, and instrumentalities, whether publicly or privately owned, that are used in publicly available services for transportation of persons or cargo. If the Limburg attack had taken place in the United States, and the perpetrators were arrested, they would be prosecuted under this statute.

*The Trade Act of 2002* (Pub.L. 107-210), which is largely devoted to giving the President 'fast-track' authority to negotiate a trade agreement with Andean nations of South America, contains a provision authorizing the Customs Service to require transmission to the agency, through an electronic data interchange system, of information pertaining to cargo destined for importation into or exportation from the United States prior to such importation or exportation. The information required shall be that which is determined to be reasonably necessary to ensure transportation safety and security. The statute also authorizes the Customs Service to require expanded documentation of waterborne cargo to be exported from the United States.

The centerpiece of the new U.S. maritime security initiative was intended to be the combination of the Senate's Port and Maritime Security Act (S. 1214) and the Maritime Transportation Antiterrorism Act (H.R. 3983) adopted by the House of Representatives. As noted above, this measure has not come to fruition due to circumstances outside the bounds of the original bills.

**Recent Initiatives**

*Coast Guard Initiatives*

Following the events of September 11, the U.S. Coast Guard immediately

established security zones and safety zones in most major U.S. ports. Sea Marshals were placed on many vessels entering or departing some ports and vessels of high interest (e.g., passenger vessels, LNG carriers, LPG carriers,

etc.) were escorted by Coast Guard patrol boats. The agency has imposed, on an as-needed basis, added requirements for security of waterfront facilities. Vessels are now required to submit their Advance Notices of Arrival at least

96 hours prior to arrival at their first U.S. port of call. Information to be included in this Notice has been expanded to include a complete list of all persons on board, a general description of the cargo, and the identity of the charter-



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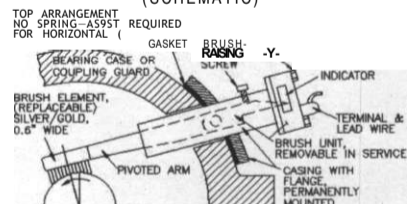
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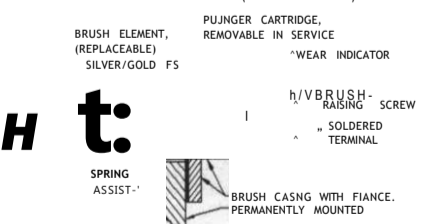
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## Government Update

er. The Coast Guard has also issued guidelines for port security committees and for preparation of port security plans.

The Coast Guard also resurrected a regulation originally promulgated in 1952 requiring maritime identification credentials. The regulation, which had

not been enforced in decades, requires persons wanting access to waterfront facilities, areas within a port or harbor, vessels, and harbor craft to carry and produce upon proper request identification credentials acceptable to the U.S. Coast Guard. To be acceptable, the credential must (at a minimum) be laminat-

ed or otherwise secured against tampering and contain the person's full name, a current photograph, and the name of the issuing authority. Acceptable credentials include a military identification card, a badge for a federal employee, a driver's license or official identification card issued by a Department of Motor

Vehicles within the U.S., a merchant mariner's document issued by the U.S. Coast Guard, a valid passport, a local law enforcement credential, an identification credential issued by a state or local port authority, or an identification credential issued by a company, union, or trade association. Meanwhile, the U.S. Department of Transportation is at work developing standards for a National Transportation Workers' Identification Card (TWIC) and the International Labour Organization (ILO) is developing standards for an internationally uniform and secure Seafarer's Identification Document.

### Customs Service Initiatives

The Customs Service recently issued a proposed rule that would, if it comes into effect, require ocean carriers to electronically present detailed manifest information to the agency at least 24 hours prior to lading the cargo on a vessel bound for the United States. The proposal would also require that the manifest report include a precise description and weight of the cargo or, for a sealed container, the shipper's declared description and weight. Generic descriptions, such as FAK (freight of all kinds), general cargo, and STC (said to contain) would not be acceptable. The proposal has engendered severe criticism as being commercially unworkable.

In addition to the proposed 24-hour advance manifest reporting requirement, the U.S. Customs Service has undertaken a variety of measures to enhance cargo security. It has increased the percentage of cargo (particularly containerized cargo) that is subject to inspection. It has deployed non-intrusive inspection devices (such as large x-ray and gamma-ray equipment) to examine entire containers in one sweep without breaking the seals. The Customs-Trade Partnership Against Terrorism (C-TPAT) enlists shippers, carriers, and intermediaries in a voluntary program to enhance security throughout the international supply chain. C-TPAT participants can expect a lower level of Customs scrutiny for cargo and vessels arriving in the United States. The Container Security Initiative (CSI) is a bi-lateral program with customs agencies in other nations whereby U.S. Customs officials working alongside host-nation customs officials help identify containers bound for the United States that should be subjected to increased scrutiny. The goal is to expedite processing of containers from those

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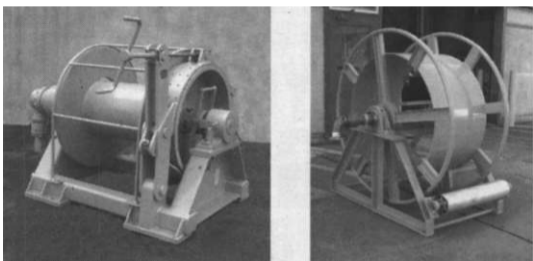
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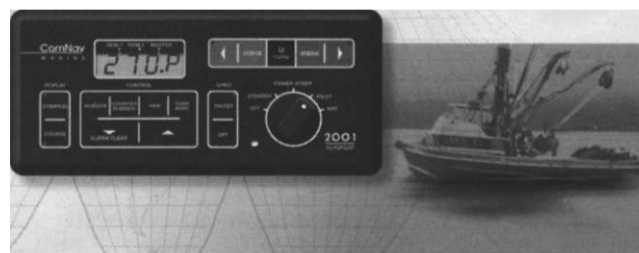
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locations when they arrive in U.S. ports. To date, the following have agreed to participate in the CSI program: Canada, Singapore, Netherlands, Belgium, France, Germany, Hong Kong, and Japan. The European Commission (EC) and others have been critical of CSI as potentially providing participating ports with an unfair competitive over smaller, non-participating ports.

**INS Initiatives**

In addition to the NSEERS program described above, the U.S. Immigration and Naturalization Service (INS) has begun issuing 'detain on board' orders relating to alien crew members whom the agency believes may present a security risk to the United States or whom the agency believes may not depart with the vessel when it leaves port. Issuance of a 'detain on board' order was a rare occurrence prior to the terrorist attacks. Now, it is quite common, particularly for certain U.S. ports on Gulf of Mexico. At times, issuance of a 'detain on board' order has many similarities to lightning — one often doesn't know when and where it will strike. A ship making port calls in different ports, but with the same crew, has sometimes been issued such an order in one port, but not another. 'Detain on board' orders have been issued up to 24 hours after the ship arrives. Masters have been refused permission to fly 'suspect' crewmembers out of the country. The INS refuses to disclose, even in general terms, what triggers a 'detain on board' order. If such information were disclosed, vessel owners and operators could reduce the risk that is apparently being presented to U.S. homeland security by the presence of these suspect crewmembers. Controversy over this policy continues.

The INS has also ceased granting routine waivers for seafarers to come ashore without all required documents. In many countries (and, previously, in the United States), seafarers were allowed shore leave and other privileges without the formality of passports and visas. That is no longer the situation in the U.S. A foreign seafarer without a valid passport and a current U.S. visa (either a personal visa or by being included on a crew list visa) is no longer allowed ashore in the U.S. except for urgent medical care. At the same time, the U.S. Department of State is proposing to eliminate the crew list visa and has increased the processing fee for a nonimmigrant visa to \$100 (from the prior fee of \$65). For a variety of rea-

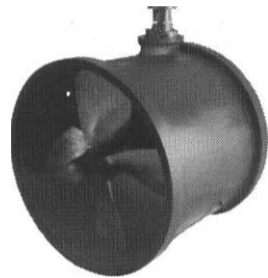
sons, processing time for U.S. visa applications in many consulates around the world has increased to two months and more. These developments have effectively made U.S. visas out of reach for many seafarers, particularly those from third world nations. The Seamen's

Church Institute and other seamen welfare groups have complained about the adverse impact these initiatives have on morale of crewmembers.

Initially, the U.S. Coast Guard was assisting, in an ad hoc manner, with enforcement of the 'detain on board'

orders. Recently, the two agencies have developed a Standard Operating Procedure (SOP) whereby the Coast Guard will issue a Captain of the Port (COTP) Order requiring a vessel for which a 'detain on board' order has been issued to remain outside the three-mile limit

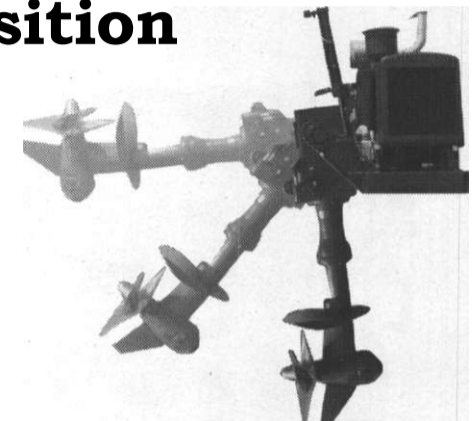
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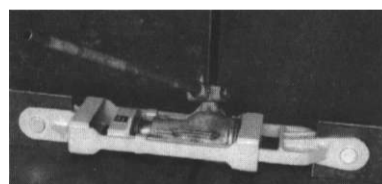
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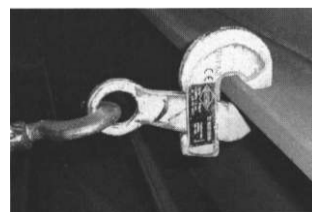
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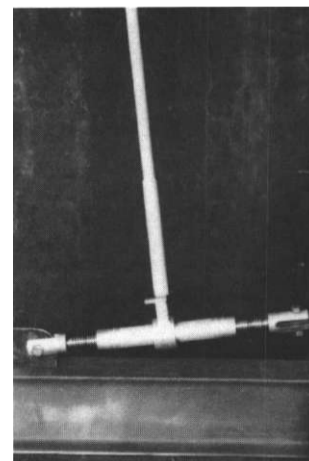
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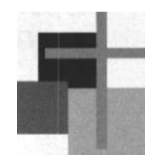


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## Government Update

until it submits a crewmember security plan and the plan has been approved by the INS. Almost always, the plan is required to include arrangements for hiring by the vessel of a commercial guard service to provide a visible deterrent

against detained crewmembers departing the vessel.

The INS inspector examines detained crewmembers when the vessel arrives and generally attends the vessel when it departs to ensure that all crewmembers

depart with the vessel. The vessel will remain under the COTP Order for the entire port call, so that any deviation from the approved crewmember security plan or other requirement constitutes a violation of federal law.

### Future Actions

The U.S. Coast Guard will continue to work with the Department of Transportation, the Maritime Administration (MarAd), and other agencies to develop a National Transportation Workers' Identification Card (TWIC). Even if the pending maritime security legislation is not enacted this year, the Coast Guard may well establish a requirement that vessels calling in U.S. ports prepare (and submit to the Coast Guard for approval) ship security plans largely consistent with IMO policy. The IMO requirements, due to be adopted in December 2002, probably will not come into effect until July 2004 at the earliest. The Coast Guard can be expected to advance the effective date for vessels making U.S. port calls.

The U.S. Customs Service will continue to deploy additional equipment to conduct nonintrusive inspections of containerized cargo. It will continue its efforts to broaden its Container Security Initiative to all major ports that export containerized cargo to the United States. It will continue to enroll shippers, carriers, and intermediaries in C-TPAT. Following some adjustments, the Customs Service can be expected to adopt its proposed regulation requiring carriers to electronically submit manifests 24-hours prior to lading cargo bound for the United States, although the effective date will probably be delayed while the agency 'ramps up' the personnel and computers needed to process the thousands of manifests that it will receive daily.

### Conclusion

Federal agencies involved in port and maritime security (particularly the Coast Guard and the Customs Service) have not waited for Congress to enact the maritime security legislation. Rather, they have utilized (and will continue to utilize), to the maximum possible extent, the considerable authorities they now possess to enhance the port and maritime security of the United States.

There will be the inevitable missteps and a long learning curve for all involved (including the agencies involved, individual enforcement officials at the port level and ship owners and operators), but events such as the attack on the Limburg have added renewed emphasis to maritime security.



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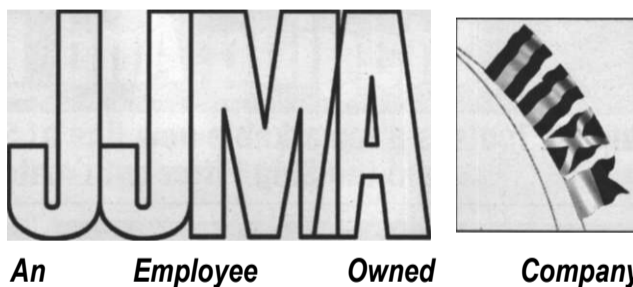
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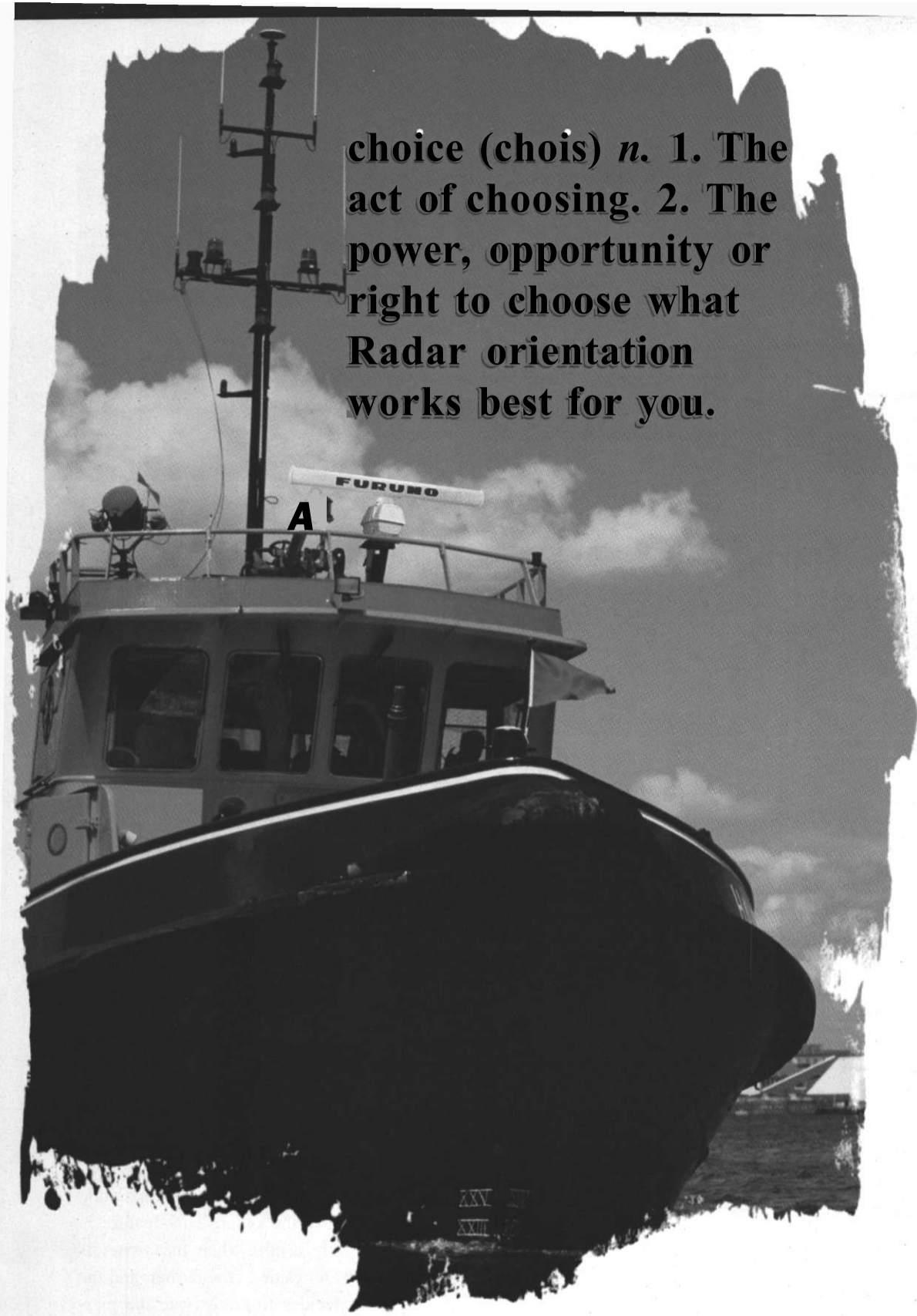
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**Maritime Security**

**Secure Marine Debuts "Fence" at Sea**

As the high seas continue to become potentially more dangerous, the increase in the amount of armed robberies and piracy attacks is climbing. Other inci-

dences, such as stowaways on vessels are becoming all too common - causing a security risk, as well as a financial burden for owners. In order to relieve the

pressures and dangers of these situations, Secure Marine has developed Secure Ship - a Ship Protection System designed to guard vessels against piracy attacks, illegal entrances and stowaways. Based in Rotterdam, Secure Marine's (which is endorsed fully by the

HBsfl



International Marine Bureau), product prevents these instances via three ways: Detection of a boarding attempt by warning the crew; scaring away boarders through very loud siren and flood lights; and prevention through an electrifying protection system.

Comprised of a collapsible electrifying fence that is placed around the vessel. Upon entering the harbor or when a boat or barge must come alongside the fence — it is designed to be easily taken down. Divided into port and starboard zones, the fence can therefore be activated only on one side of the ship, while deactivating the other. This feature is particularly useful when the vessel is moored alongside in the harbor, and the master decides to de-activate the pier-side while keeping the waterside active.

Futhermore, the fences have "gates," which allow temporary openings as required for pilots, gangways and liferafts. A technologically-driven control system detects entry attempts and then transmits them to various output devices such as lights, alarms and sirens. Non-lethal high voltage gives off the effect that the vessel is virtually secure, while protecting the crew. If a power failure should occur onboard, the system will continue to detect intrusion attempts. The Energizer system gives off high voltage peaks with a maximum of 9,000 volts, thus guaranteeing a non-lethal shock (the legal limit of 8 Joule), at the least amount of contact with the electrified wire.

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## All Set Tracking Launches New Electronic Seal

In order to meet upcoming requirements for container security, All Set Tracking has developed the ALLTrack e-Seal that will make electronic sealing easy and flexible. The completely new design takes into account the needs of ocean carriers, port operators and shippers both in terms of technical performance and cost efficiency.

The new e-Seal is permanently installed on the container and does not use the traditional door locking mechanism at all, which can continue to be sealed using a simple, wire seal in wide use today. The e-Seal uses the same ultra-low power radio "Bluetooth Lite" transmitter used in the ALLTrack Tag and Reader.

As opposed to traditional electronic seals the ALLTrack e-Seal will use a single globally available radio frequency band, which is license-free. Since the ALLTrack system uses low cost Readers, at a fraction of traditional RFID Readers, the reading infrastructure will be cost efficient to roll out. Due to its small size and high flexibility, the ALLTrack Reader could easily be connected to a standard mobile phone and thus become a "mobile" reader.

The new ALLTrack e-Seal will be installed permanently in the container, and by the door hinge a small sensor registers door-opening events.

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## BIMCO Advises Vulnerability Evaluation

BIMCO has expressed concern by the recent revelations indicating that the explosion on board the supertanker Limburg was caused by an act of terrorism — the first attack on a merchant vessel since the Achille Lauro incident in 1985. The French tanker, owned by BIMCO members CMB, was en route to Yemen when it was apparently rammed by a motorboat packed with explosives — similar to the attack on the U.S. naval ship Cole at Aden on October 12, 2000.

The Limburg incident illustrates well the dire consequences created by acts of terrorism, placing the lives of seafarers in grave danger with fatal consequences, causing severe material damage and, not least, causing significant environmental harm. It also raises questions as to which, if any, of the maritime security initiatives now under development at the IMO and elsewhere could have helped to prevent such an attack.

November, 2002

## Singapore Joins U.S. Customs CSI

Robert C. Bonner, Commissioner of the U.S. Customs Service, announced the signing of a declaration by the government of Singapore to join the Con-

tainer Security Initiative (CSI), a key U.S. Customs initiative designed to prevent global sea cargo from being exploited by terrorists to inflict harm on America and other nations of the world.

Launched by U.S. Customs in January 2002, the CSI is designed to enhance the

security of global maritime shipping, a vital link in world commerce. Some 200 million sea cargo containers move annually among the world's top seaports, and nearly 50 percent of the value of all U.S. imports arrive via sea cargo containers every year.

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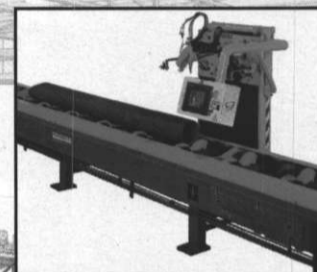
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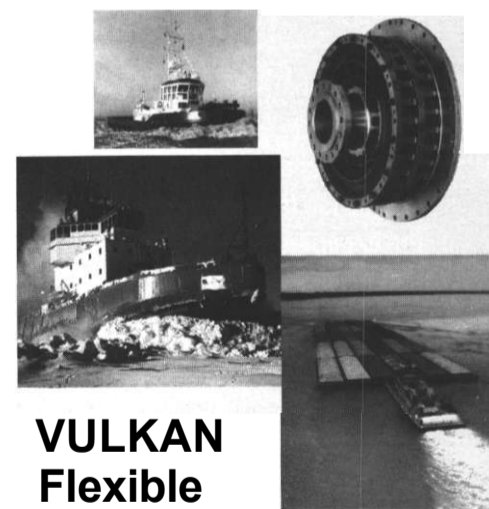
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## Maritime Security

### Additional Funding Urged for Port Security

U.S. public port authorities discussed the need for Federal legislation and continued Federal funding for maritime security. Urging Congress to appropriate additional funds for Fiscal Year '03 dur-

ing their Legislative Policy Council (LPC) meeting on September 23, 2002, port authorities met recently at the 91st Annual Convention of the American Association of Port Authorities (AAPA), at the Breakers Hotel in Palm Beach, Fla.

**John A. Flaherty**, Chief of Staff of the

Department of Transportation, said that ports have an historic opportunity to influence reauthorization of the Transportation Efficiency Act (TEA 21) next year, when the current legislation expires in September. TEA 21, AIR 21, and Amtrak reauthorization will be debated at the same time. The House

Appropriations Transportation Subcommittee also approved \$150 million for port security grants in Fiscal Year (FY)'03 appropriations, with the full Appropriations Committee taking action on September 26. Earlier this year the Senate approved \$100 million to continue the port security grant program in FY'03. The Administration recently agreed to reprogram additional funding of \$125 million in port security grants for FY '02.

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### Procedures for Detaining Crewmembers on Board

The U.S. Coast Guard and the U.S. Immigration and Naturalization Service (INS) have developed a Standard Operating Procedure (SOP) for identifying crewmembers on board vessels coming to U.S. ports who need to be detained on board during the port call and for taking steps to ensure that those crewmembers remain on board and depart with the vessel. Under this policy, which is scheduled to come into effect in Delaware Bay, Chesapeake Bay, and Savannah on October 28, 2002, the USCG will share crewmember data from the Advance Notice of Arrival with the INS. The organization will then determine whether any or all crewmembers should be detained on board. If so, the USCG will order the vessel to remain at least three n.m. offshore until the vessel submits a crewmember security plan that is acceptable to the INS.

### Limburg Probe to be Carried Out Jointly

The Yemen Government released a Statement on October 10, 2002, revealing that the Yemeni and French investigations into the incident on the French oil tanker Limburg are to be conducted jointly. The IMO will send an expert to help assess the environmental effects of the oil spill.

At the Briefing of October 10 conducted by the U.S. Department of State, the spokesman said that "terrorism has not been ruled out as a possible cause." In a related development, MarAd issued an Advisory warning of non-specific threats, apparently by al Qaeda leaders, against U.S. economic interests. Mariners are advised to be on a heightened state of alert and U.S. vessels required to file AMVER reports and operating in the North Arabian Sea, Gulf of Oman, Persian Gulf, Gulf of Aden, Red Sea, and the Suez Canal are reminded to file position reports every 24 hours vice every 48 hours.

## Austal to Build Circle Line's First High Speed Vessel

Austal USA has signed a contract with New York operator, Circle Line-Statue of Liberty Ferry, Inc. (Circle Line) for a 143-ft. (43.5-m) passenger catamaran, which will be the first aluminium high-speed vessel for this operator and the third contract Austal USA has secured for the New York area in the last six months. When delivered in late June 2003, it will be part of an association between New York State and the Austal Group with the 136-ft. (41.4-m) Cloud Nine dinner cruise vessel being delivered by Austal USA in the previous month and the delivery the following month of a 280-ft. (85.3-m) High Speed Catamaran into Rochester, N.Y. by Austal Ships of Australia.

Main Particulars	
Length, (o.a.)	143 ft. (43.5 m)
Beam, (molded)...	38 ft. (11.5 m)
Hull depth, (molded)	12 ft. (3.6 m)
COI	600
Main engines	4 x Cummins KTA 38-M2
Gearboxes	4 x Reintjes WVS 440 DL
Waterjets	4 x Hamilton 571
Speed	29 knots
Survey	USCG according to 46 CFR Subchapter K

Capable of 29 knots and with the capacity for 600 passengers, the new vessel has been developed through close co-operation between Austal USA and Circle Line and will expand their harbor sight-seeing cruises, evening charters and longer distance runs.

The catamaran's interior incorporates numerous features that will enable Circle Line to quickly change the configuration for these different operating modes. Power for the vessel will be supplied by

four Cummins KTA38M2 diesel engines, each coupled to a Hamilton 571 waterjet through a Reintjes WVS 440 reversing gearbox.

This configuration allows the catamaran to be operated with either two or four engines, giving the vessel two distinct service speeds to match its varied operating profiles.

The vessel is scheduled to enter service in early July 2003, and Circle Line has an option to purchase a second vessel.

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## MHI Receives Dredger Order from Suez Canal Authority

Mitsubishi Heavy Industries, Ltd. (MHI) has received an order for a large size dredge from the Suez Canal Authority of Egypt. The vessel, which will be the largest dredger ever built in Japan with a hopper capacity, will be built at the Kobe Shipyard and Machinery Works of MHI and is slated for the delivery in June 2004.

To date, MHI has delivered six dredgers to the Suez Canal Authority, and this order is the first dredger order for MHI to receive from the Suez Canal Authority in the past 18 years, to which MHI delivered a dredger with the hopper capacity of 6,500 cu. m. in 1984, which was ordered in 1983. The vessel is of a trailing suction hopper dredger having hold capacity of 10,000 cu. m., the vessel is capable of dredging silt, mud, sand and gravel by means of two drag arms situated on both sides of the vessel. The dredged materials are to be discharged through the conical bottoms valves equipped on the bottom of the mud hold.

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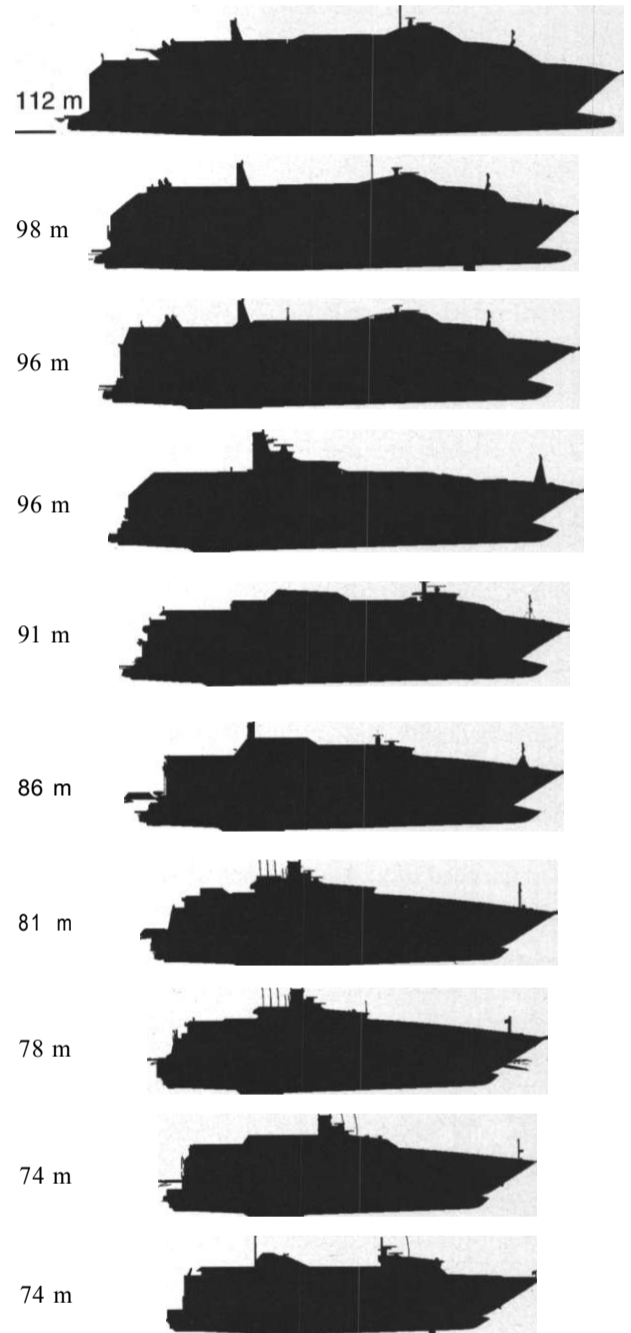
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The State of Delaware Division of Fish & Wildlife took delivery of First State to replace its current Fisheries Research Vessel, a 100-year-old converted wooden sailboat. The new 62-ft. (19 m) vessel, designed by Nigel Gee & Associates, was built by Derecktor in aluminum with a hard chine hull. The resiliently mounted pilot house provides low noise levels. Behind the house, the ample aft deck has been fitted with swinging A-Frame and cargo boom, net reel, trawl winches, dredge roller and towing bit.

The twin Daewoo T180VIM (641-hp @ 2,100 rpm) engines have been resiliently mounted. They drive twin fixed-pitch propellers through ZF gearboxes. The propulsion package together with the modern fishing gear makes this boat a lot more efficient and also a lot safer than the Department's former/current vessel. Fully loaded, this new boat has a top speed of 22 knots. It has been

designed to be operated with a crew size of nine. Planned uses of the new vessel include study and sampling of the fisheries in the Delaware River and Bay. The increased speed and sea worthiness of the vessel will allow for more consistent and extended fisheries sampling.

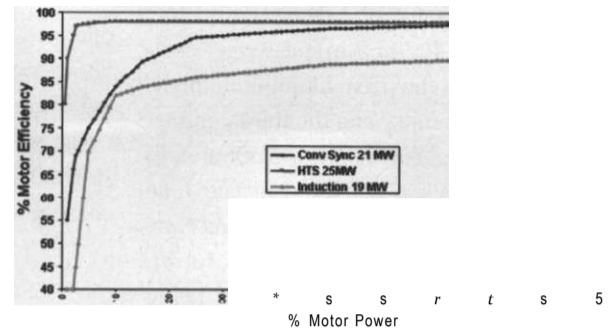
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Main Particulars - Research Vessel	
Builder	Derecktor Shipyards
Naval Architect	Nigel Gee & Associates
Hull Material	Aluminum alloy
Superstructure	Aluminum alloy
Length, (o.a.)	62 ft. (18.8 m)
Length, (waterline)	57ft. (17.3 m)
Beam, (o.a.)	17 ft. (5.1 m)
Draft	5 ft. (1.5 m)
Displacement	29.5 MT
Top Speed	22 knots
Engines	2 x Daewoo T180VIM (641 HP@2100 rpm)
Generator	1 x Northern Lights 32 kW
Passengers	10, (max)

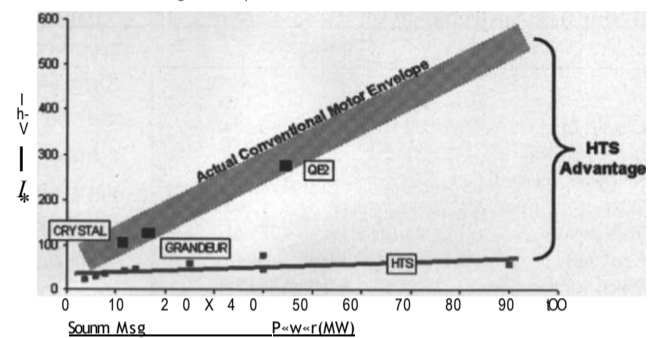
Correction

In the September 2002 edition of *MRIEN*, the charts included with the article Optimal Electric Ship Propulsion Solution, which appeared on page 51, were inadvertently mislabeled. The corrected charts appear below.

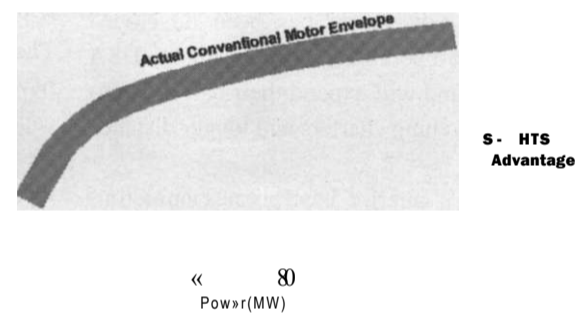
Efficiency Comparison HTS to Conventional



Weight Comparison: HTS versus Conventional



Volume Comparison: HTS versus Conventional



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## Stena Christens Tanker For Coastal Waters

On October 15, 2002, Stena Bulk in Gothenburg christened its second C-MAX Class crude oil tanker, The Stena Calypso.

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J

The christening took place at the quayside in Gothenburg and the vessel's godmother was **Rosalind Simmons**, wife of His Excellency **Peter Simmons**, High Commissioner for Barbados in London. The tanker will be deployed in the Caribbean.

Like its sister ship Stena Caribbean, Stena Calypso is a high-safety vessel built for service in environmentally sensitive waters. The vessel is characterized by extremely high maneuverability thanks to stern propellers, which can be rotated 360 degrees, and a bow propeller, a double bottom and integrated steering and navigation instrumentation. In addition, it has very flexible cargo intake — up to 17 different types of products can be transported simultaneously, including liquid gas in two on-deck containers.

During the vessel's christening, **Lars Carlsson**, president of Concordia Maritime — the Stena company responsible for the management of the Stena Calypso — said that the shipping company was following developments in the Baltic with interest. One assessment is that oil freight rates on the Baltic will double in the next five years. Considering the Baltic's extreme environmental sensitivity, C-MAX-type vessels would be very well suited for service in the region.

Stena is making major investments in the Safe Tanker segment. Last year, Concordia Maritime took delivery of very two large tankers built according to the same principle: Double safety, large cargo intake and a shallow draft. Carlsson also expressed concern that the stagnating freight market could result in yards focusing on building ships with reduced safety. Carlsson, who is the chairman of the international shipowner

organization Intertanko, said that the organization intends to introduce an award, "The Environmental Challenge", to stimulate a safety philosophy in the industry.

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## Lloyd's Register And Teekay Enter Agreement

Lloyd's Register has entered into an agreement with Teekay Shipping Corporation to class 11 of its Aframax tankers.

In addition, Teekay has chosen Lloyd's

Register to class two of its Aframax newbuildings, scheduled for delivery in 2004, to be built at Daewoo Shipbuilding & Marine Engineering Co. Ltd in South Korea.



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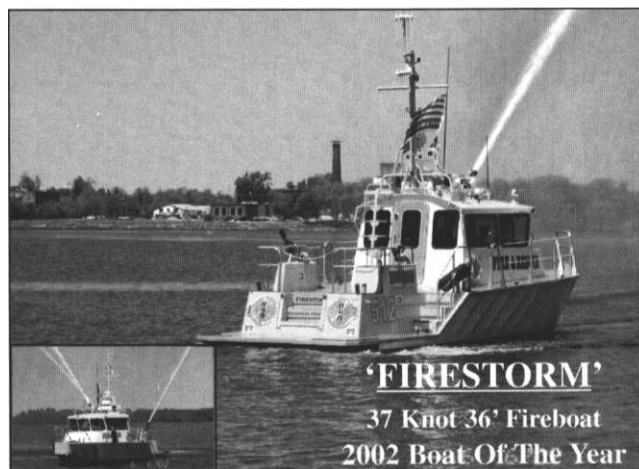
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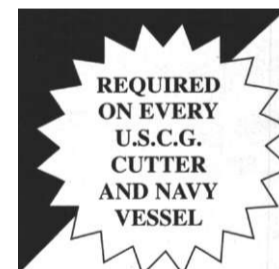
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## New & Notable

### New Fast Craft For Kristiansand City F.D.

Kristiansand Fire Department received a new 32-ft. (9.7-m) Fast Response/Rescue Craft in August 2002, which was built by Innovation AS.

The vessel's aluminum hull features

three watertight bulkheads, deep V front section and a monohedron V in the aft section, with wider stern section and is designed for maneuverability, good sea keeping and a stable work platform.

The Kristiansand Fire Department will use the craft for diving and rescue oper-

ations, pleasure boat fires, accidents and assistance, fires on the coastline/islands outside Kristiansand where access with fire trucks is impossible, and also as an ambulance as and when required.

Fitted with a single diesel engine, driving a single UltraJet 305 waterjet via a

#### Main Particulars

Type of Vessel . . . . . Fast Response/Rescue Craft  
 Builder . . . . . Innovation AS  
 Hull . . . . . Monohedron planing  
 Construction . . . . . Aluminum  
 Length, (o.a.) . . . . . 32 ft. (9.7 m)  
 Beam . . . . . 9 ft. (3 m)  
 Displacement . . . . . 4.3 tons unladen, 5.5 tons laden  
 Deadrise . . . . . 20° at transom  
 Power . . . . . Caterpillar 3126B, 450hp @ 2800 rpm  
 Gearbox . . . . . ZF280, ratio 1:1  
 Propulsion . . . . . Single UltraJet 305

ZF Gearbox, the vessel, prior to delivery, underwent sea trials in Oslo Harbor with members of the Oslo Harbor, Police, Fire, and Ambulance Authorities being present.

A top speed of 36.8 knots at 5.5 tons was recorded on the GPS during trials, with an average both ways over a five-km course of 35.5 knots. With top speed in light conditions just below 40 knots, excellent sea keeping characteristics were demonstrated with dry decks, good motion responses and tight turning circles during full speed, which were attributable to the UltraJet propulsion system.

During tender negotiations, noise levels were considered to be a very important factor for the rescue personnel and craft commander. They needed to be able to communicate with the base and each other from the time the alarm goes off until the accident/fire scene is reached. Noise level in the thermally insulated wheelhouse at top speed is around 70 dBA.

At the predicted 35 knots operational speed, the Fire Department can reach the border of their response area in 10 minutes.

Other equipment fitted includes a bow ramp for easy access on shore. Two large doors and a folding platform on the starboard side provide easy recovery of personnel from the sea, and a powerful Zenon searchlight fitted to the roof of the wheelhouse.

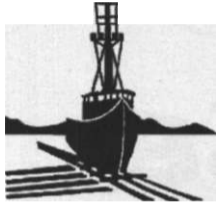
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### Fortieth LNG Delivered To LR Class

The delivery of Puteri Intan Satu, on August 29, to Malaysia International Shipping Corporation (MISC) marked the arrival of the 40th LNG ship into Lloyd's Register's LNG fleet.

Puteri Intan Satu, built by Mitsubishi Heavy Industries (MHI), has a cargo capacity of 137,489 cu. m and utilizes the Gaztransport and Technigaz No. 96 E-2 membrane containment system.

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## Double-Hulled Products Carrier For Dubai Company

In late August 2002, the Dubai Drydocks delivered an innovative 148-ft. (45-m) lube oil tanker to Gulf Agency Company of the same city, for lube oil transport and supply.



The vessel, named GAC Mumtaz was built to a design from GS. Chopra of Seatech Solutions in Singapore. With a beam of 39 ft. (12 m), the vessel will carry up to six TEU (20-ft. equivalent unit) containers in addition to three 50 cu. m. lube oil cargo tanks. Other tankage includes 60 cu. m. of fuel and 20 cu. m. of water. The steel fabrication materials for the hull and superstructure plate ranges from eight to 11 mm. The 11-ft. (3.5-m) molded depth of the hull is built with a double skin and bottom for added safety. Accommodation is provided for 10 people.

Main engines are a pair of Cummins KTA19 M4 engines rated for 700 hp (Medium Continuous Duty) each at 2,100 rpm. The twin Cummins engines turn into Reintjes WAF 264 marine gears. Operational speed is 10 knots with a 12-knot maximum speed.

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## HERON Lands at Fisher Island

Seattle-based Elliott Bay Design Group (EBDG) has announced that the HERON, the fourth vessel to join the Fisher Island fleet, has been delivered. Built by Eastern Shipbuilding Group in Panama City, Fla., the double-ended vehicle ferry was



accepted by Fisher Island Community Association on October 9, 2002. EBDG completed the upgraded Contract Design and later served as Owner's Representative during vessel construction.

The new vessel measures 120 ft. (36.5 m) overall, with a beam of 46 ft. (14 m) and a draft of 7 ft. (2.1 m). The HERON carries 22 vehicles and up to 100 passengers.

November, 2002

Main Particulars	
Length, (o.a.)	..120 ft. (36.5 m)
Length, (waterline)	..116 ft. (35.3 m)
Breadth, (molded)	46 ft.
Breadth, (waterline)	...37 ft. (11.2 m)
Depth, (molded)	12 ft.
Design draft	7 ft. (2.1 m)
GT	.. Less than 100
Horsepower (@ 1,800 rpm)	450 bhp, each end
Fuel oil capacity (@ 95%)	... 5,348 gallons
Automobile capacity	22
Passenger capacity	100

According to EBDG Project Manager **Will Nickum**, P.E., the HERON was "designed for maintenance."

Special consideration was placed on improvements geared towards maintenance and compatibility with the existing fleet. According to Nickum, "the design ground rules were fairly straightforward: match the existing design in hull form, arrangement, appearance and handling, use proven local suppliers for equipment, and improve maintenance of hull and equipment in every way possible."

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## Gladding-Hearn Delivers Fast Ferry for Lake Erie

Gladding-Hearn has delivered Jet Express III, a new 88-ft. (26.6-m) high speed passenger ferry for Put-In-Bay Boat Line and Put-In-Bay Township Port Authority of South Bass Island, Ohio.

The catamaran, built to the Incat design, will transport up to 149 passengers between Port Clinton and South Bass Island on Lake Erie. The owner currently operates two 98-ft. high speed ferries, which have carried more than 150,000 passengers each summer from the mainland for more than a decade.

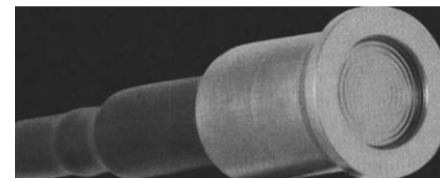
The new Jet Express III features composite hulls and an aluminum superstructure. Gladding-Hearn built and equipped the superstructure, while TPI Composites of Warren, R.I., fabricated the hulls from vinyl ester resins and E-glass over a balsa core, using the SCRIMP vacuum-bagging process.

"The design of this boat is simple in order to keep the price, operating costs and maintenance to a minimum," said **Peter Duclos**, the shipyard's president. "We selected a composite hull laminate schedule that provided the best combination of cost, low weight, high impact resistance and ease of repair."

The vessel has a 28-ft. (8.6-m) beam and draws four ft. (1.3 m). It carries 1,400 gallons of fuel, is driven by KaMeWa FF-550 waterjets and is powered by twin diesel engines that deliver 1,100 bhp at 2,300 rpm, through ZF 1900 gear boxes. The waterjets have built-in interceptor-type trim tabs to optimize performance under a variety of conditions. The vessel's top speed, fully loaded with passengers and baggage, is 30 knots.

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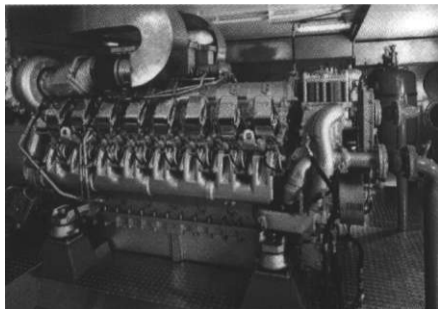
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## MTU Engine Series Logs Success on Inland Waterways

MTU Series 2000 and 4000 engines have recently been optimized for the requirements of inland shipping, a development that might not bode well for makers of engines used to dominating this niche away from the MTU brand.



Since being launched in the year 2000, the new series of engines, which are available in 12 and 16-V versions, have had excellent continuous duty records, according to the manufacturer. Subsequently, MTU broke into the inland shipping market with its high-speed, heavy-duty engines. The company also prepares the Detroit Diesel Series 60 in the 300 to 350 kW range for the German and European markets.

Both the 2000 and 4000 series engines meet the emissions limits of the IMO, and already comply with the emissions limits laid out by the Central Commission for Shipping on the Rhine (ZKR), which comes into force in January 2003. They have proven their worth as prime moves for inland ships in the power range between 400 and 1,760 kW, and the range of application extends from 80-m long container and bulk-cargo barges to cruise ships.

The Series 200 engines are available in 8-, 12- and 16-V versions. For the powering of commercial vessels, the engines cover a power output range from 400 to 800 kW at 1,800 rpm. For use on inland ships, the engines have been optimized. For example, MTU has reduced the consumption figures through improvements in the combustion process.

Also, MTU has made the engines more robust and durable with new high-pressure injectors. In addition, the engines have been optimized to deliver significantly higher torque and to accelerate more easily in the lower and medium engine speed ranges.

Last year, MTU sold 1,700 engines from this series, including 500 to power ships. Technical innovation on the 4000 Series has focused more on the reduction of lube oil consumption, which is

now only 0.3 percent of the standard fuel consumption. This was made possible by re-optimizing the interplay between piston, cylinder liner and piston rings.

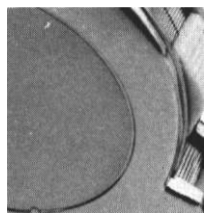
Series 4000 engines are four-stroke

diesel engines with direct fuel injection, exhaust-gas turbocharging and charge-air cooling, 4.06 liters displacement per cylinder, a bore of 165 mm and a stroke of 190 mm.

Available in 8, 12 and 16-V versions,

MTU offers these engines for the powering of commercial vessels in the power output range from 700 to 1,460 kW at 1,600 rpm, and for passenger shipping in the power output range from 880 to 1,760 kW at 1,800 rpm.

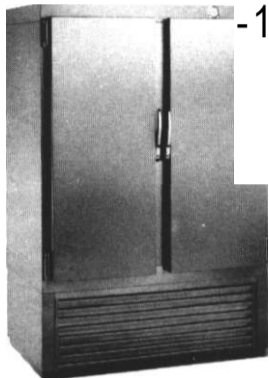
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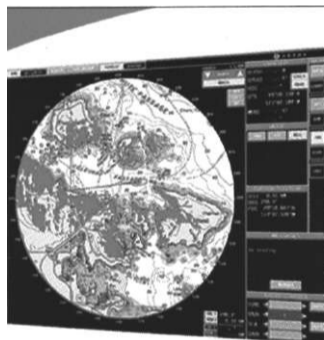
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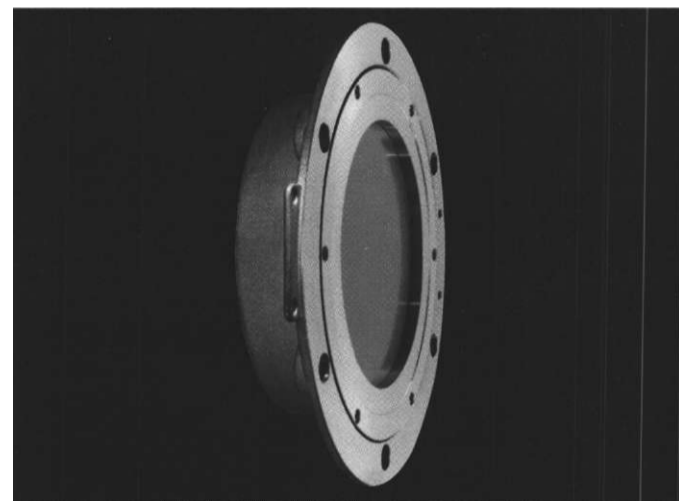
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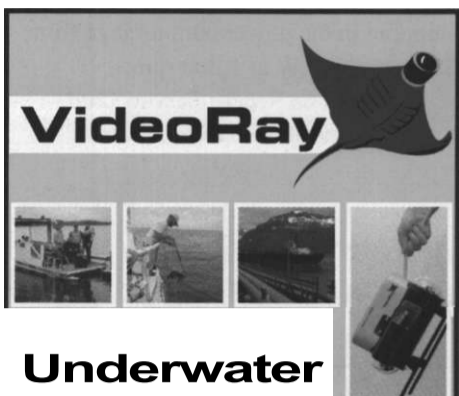
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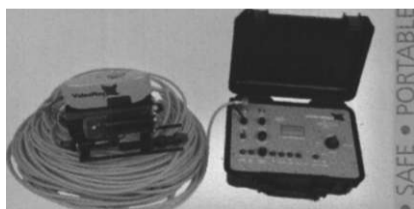
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## JHC: Recent Hull Losses Will Increase Pressure For Rate Hikes

The Joint Hull Committee in London (JHC) estimates that the total cost of recent marine hull losses to the global insurance market could be as much as \$750-million. The committee added that the cumulative effect of these losses would result in yet more pressure being applied to rates for hull business, which are still considered uneconomic despite increases having been achieved during the past 12 months.

Diamond Princess is the most significant in a string of expensive claims to hit the marine insurance market recently. The vessel, which had a Full Contract Value of up to \$500-million, was being built for P&O Princess Cruises at the Mitsubishi Heavy Industries yard in Nagasaki, Japan, when it was engulfed by fire, which caused extensive damage.

That incident followed rapidly on the grounding of the car carrier HUAL Europe, with an estimated insured value of over \$50-million, in Tokyo Bay, off Yokohama, on October 1. Other major casualties include Jolly Rubino, the Hidir Bay, HUAL Troubadour, Treasure Bay, Alva Star and Limberg.

## Anteon Awarded \$40M Ship's System Support Contract

Anteon International Corporation announced that Supervisor of Shipbuilding (SUPSHIP), Portsmouth, Va., has awarded Anteon with a five-year contract with an estimated value of \$40 million. Anteon will provide rapid response systems engineering and integration support for major ship components onboard military vessels.

## KMSS Training/Simulation Division Is Buoyant

Kongsberg Maritime Ship Systems (KMSS) has announced a buoyant period for its training and simulation division. They have recently received contracts from the Canadian Coast Guard College, the Navy Academy in Taiwan and the AMA Computer College in the Philippines. KMSS has also opened a new training center on its site in Horten, Norway.

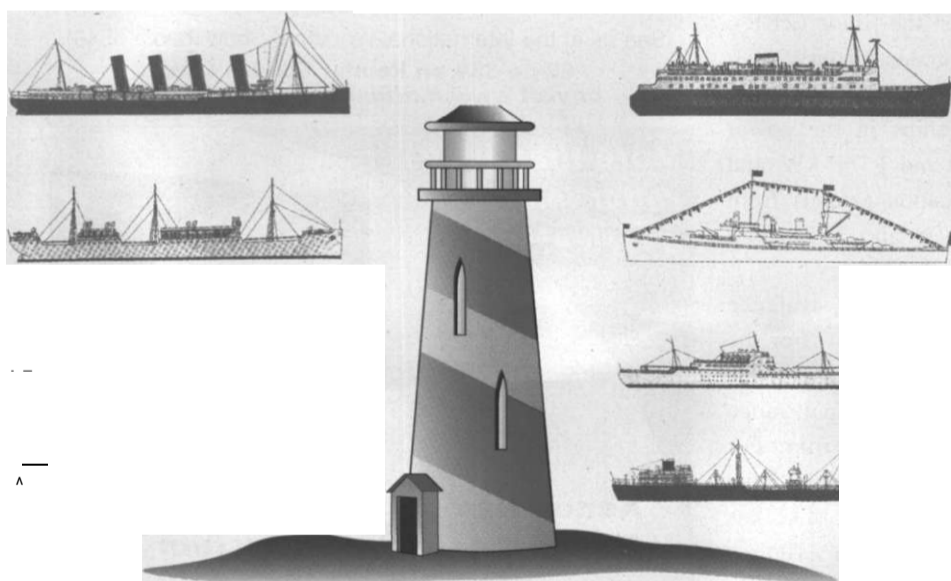
The revolutionary new distance learning system known as maritime.e-campus.com has just been adopted by the Canadian Coast Guard College, which works as an education portal, giving students the opportunity to train from home and even on board ship.

KMSS has also recently been contracted to supply simulator systems to the Navy Academy in Kaohsiung, Taiwan. The system comprises of an instructor station and four student workstations. Known as the Codog MTU/LM2500 Frigate - C042, this system is the most advanced Navy model ever developed, and replaces an already existing system installed by KMSS in 1996.

With installation and training of personnel occurring this past September, October sees KMSS installing Polaris Panorama Desktop Simulators, complete with visuals at the AMA Computer College, Quezon City, the Philippines, during October.

In Norway, KMSS has also established a product training center at its main site in Horten. This center offers courses on most KMSS products including the Maritime Black Box, Navigation, Machinery Control, Propulsion Control and Bridge and Engine/Cargo simulators.

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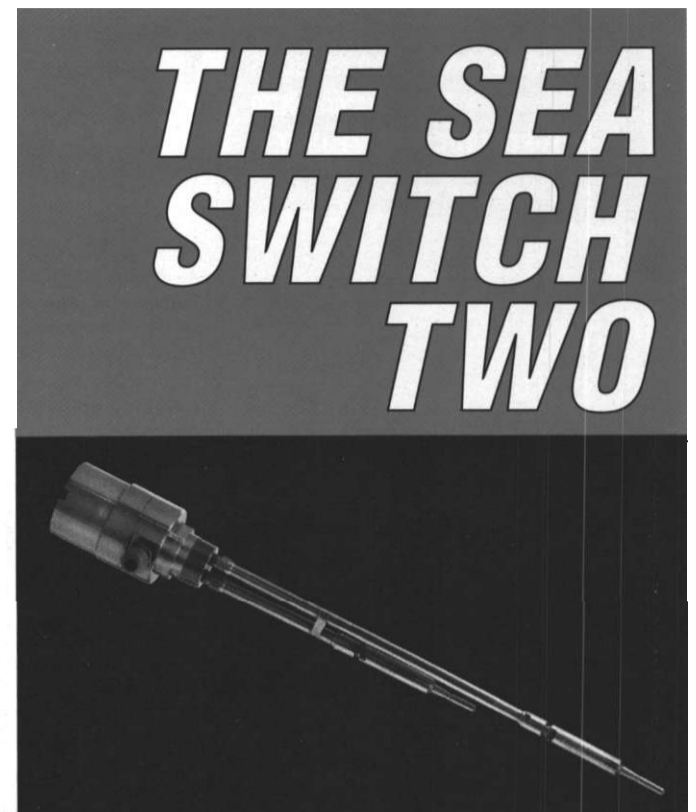
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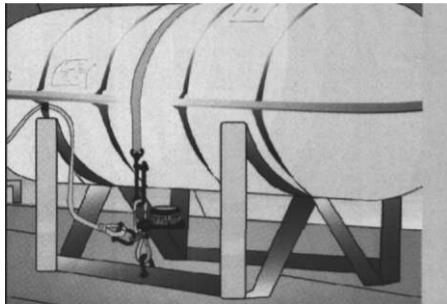
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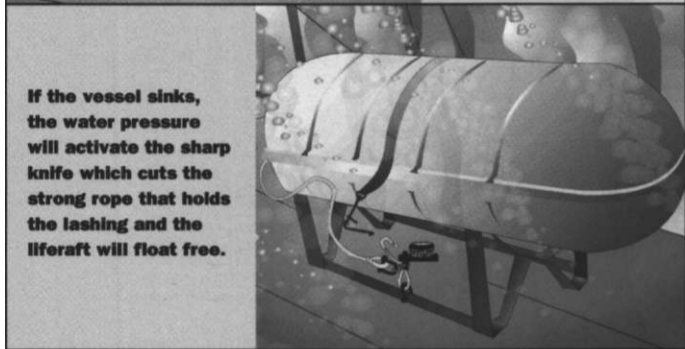
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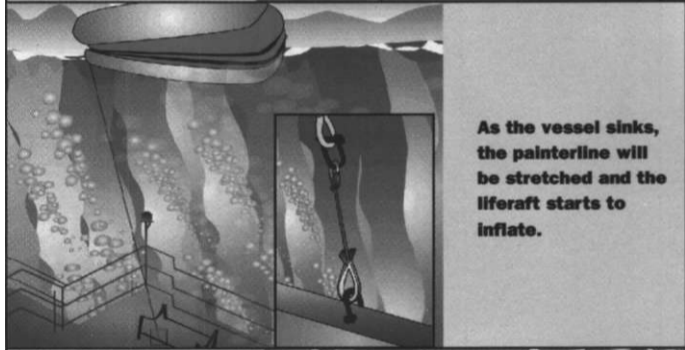
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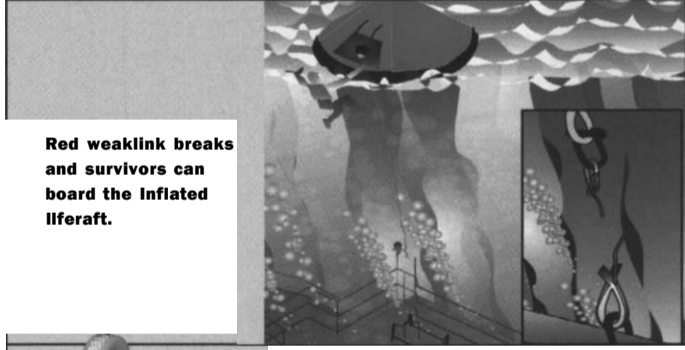
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# Crowley takes lead with "Reliance"

The 9,280 horsepower Ocean Reliance is the first of two tugs built by Marinette Marine Corp. for Vessel Management Services, a Crowley Maritime Co. The vessel is intended to operate as a tug/barge unit in conjunction with the 155,000-barrel tank barge 550-3. Construction engineering for the barge was also accomplished by Schuller & Allan LLC. The connection device is an Intercon Coupling system.

Earlier this year, Vessel Management Services, Inc. christened the first of four Articulated Tug-Barge (ATB) tank vessels that the company took in 2002, the 9,280-hp tug Sea Reliance and 155,000-barrel barge 550-1, built by Halter Marine. The barge 550-1 was built at Halter's Port Bienville shipyard in Pearlinton, Miss., and the Sea Reliance at its Moss Point Marine shipyard, in Escatawpa, Miss.

The series is significant as it marks the first petroleum barge to be built under the ABS Safe-Hull program. "We are pleased to be the first company to build a petroleum barge under the ABS (American Bureau of Shipping) SafeHull program," said **Tom Crowley**. "Under this program ABS puts the vessel design through an exhaustive review process, which examines in finite detail the areas of the structure subjected to stress under dynamic conditions. The design is then modified to strengthen areas found to be less than adequate. This up front engineering results in fewer out of service delays for the life of the vessel."

"Halter Marine is committed to continue its positive impact on the Gulf Coast," said **Anil Raj**, COO of Halter Marine. "This project has provided jobs for more than 200 of the most skilled engineers and craftsmen in the shipbuilding industry."

By the end of 2002, Vessel Management Services will have taken delivery of a total of four tug and barge units, two from Halter and two from The Manitowoc Company

The series meets all SOLAS (Safety of Life at Sea) and ABS criteria, and has a foam capable fire monitor; twin fuel efficient, reduced emission electronic diesel engines; a noise reduction package and other upgrades to increase crew comfort. And the communication and navigation equipment is among the most technologically advanced in the industry today.

At ceremonies held at the Bay Shipbuilding Company in Sturgeon Bay, Wis., **Molly Crowley**, a director on Crowley's board, christened the tug. More than 100 people braved a cold, rainy and



snowy Wisconsin day to attend the christening ceremony.

Intrepid Ship Management, a subsidiary of Marine Transport Lines, will charter the ATB from Vessel Management Services and operate it. Marine Transport is a Crowley subsidiary and part of its oil and chemical distribution and transportation segment.

"We are pleased to place this new ATB into service with our other ATBs which were completed earlier this year," said **Tom Crowley Jr.**, Chairman, President and CEO of Crowley Maritime. Already in service are the Sea Reliance and barge 550-1, and the Sound Reliance and barge 550-2.

"I am proud of the job the engineering and construction crews did on the design and build of this state-of-the art ATB," said Crowley. "We are confident that this vessel will provide many years of service to our customers on the west coast."

"This occasion has been made possible as a result of the faith that Vessel Management Services placed in our Manitowoc Marine Group Companies," **Pat O'Hern**, Vice President and General

(Continued on page 90)

### Sea Reliance/Ocean Reliance Main Particulars

Builders . . . . .	Halter Marine/Marinette Marine	Gears . . . . .	Reintjes	Fresh Water . . . . .	17,000 gal.
Owner . . . . .	Vessel Management Services	Propellers . . . . .	Stainless Steel, 5-blade	Fuel Oil . . . . .	185,000 gal.
Mission . . . . .	Dual-mode ITB Tug		Bird Johnson, 144-in diameter	Lube Oil . . . . .	2,300 gal.
Length . . . . .	127 ft. (38.7 m).	Controls . . . . .	Mathers	Dirty Oil . . . . .	2,100 gal.
Beam . . . . .	42 ft. (12.8 m)	Steering System . . . . .	EMI	Oil Bilge Water . . . . .	2,100 gal.
Depth (molded) . . . . .	22 ft. (6.7 m).	Classification/Certification . . . . .	ABS	Hyd. Oil . . . . .	400 gal.
Draft . . . . .	18 ft. (5.4 m).	Winches . . . . .	Markey Machinery	Gear Oil . . . . .	1,800 gal.
Main engines . . . . .	(2) Diesel engines producing 4,640 bhp @ 900 rpm	Speed . . . . .	12 knots	Ballast . . . . .	76,000 gal.
		Crew . . . . .	11	Fifi Foam . . . . .	2,100 gal.

# Markey Provides the Strong Pull

Seattle-based Markey Machinery, for nearly one century, has proven itself to be one of the top deck machinery companies in the country. Started in 1907 by Charles Markey as the C.H. Markey Machinery Co. — serving the marine and logging industries — the company evolved into a leading maker of advanced deck machinery, as evidenced by its long list of high profile references, such as Crowley's new tug Response.

The company's early years included a number of different partners and business tactics. Perhaps the defining moment for the company was World War I, which resulted in a skyrocketing demand for machinery, and resulted in the company moving in the spring of 1917 to Horton Street in Seattle, which is where the company's main plant still sits today. That factory, in order to supply the burgeoning need for steam cargo winches, anchor windlasses, power steering engines and other types of deck machinery to support the war effort, ran at full capacity, around the clock, for two years.

With the company now solidly entrenched in the Seattle culture, it progressed through subsequent times - both good and bad - with its signature adherence to building, installing and maintaining quality products. The steam steering system installed aboard the sternwheeler tug Portland in 1947 is perhaps the best example. The tug worked in the Columbia River for years, before becoming a riverside museum. Markey's steam steering system still works, and the company continues to service it on a

Since 1917 Markey Machinery has been a familiar fixture on Horton St. in Seattle, and its equipment a fixture on some of the world's best workboats.



regular basis, even making parts when necessary.

Today, the company's product line consists of:

- Deep Sea Winches for line sizes from 0.25 to 1.5-in. (6 to 38 mm) with line capacities up to 45,000 ft. (13,700 m);
- Near Shore Research Winches for line sizes from .1875 to .3125-in (5 to 8 mm) with line capacity up to 6,500 ft. (2,000 m);
- Traction Winches for line sizes from .25 to 1 in. (6 to 25 mm) with line capacities up to 45,000 ft. (13,700 m), ideal fiber optic cable or below deck installation;
- Single and double drum Tow Winches for line sizes from 1 to 2.5 in. (25 to 64 mm) wire rope clutches, with a full range of control options and diesel, hydraulic and electric drives;
- Escort & Ship Assist Winches, with hydraulic or electric drive, a full range of control options, fast line speeds, high braking capacities, line monitoring system and emergency abort operating mode.

In addition, the company is able to produce any number of specialty winches to a customer's specification.

#### Markey Machinery on Response

Markey Machinery Co., Inc. of Seattle has supplied equipment onboard Crowley's tug Response.

(Continued on page 87)



One of the winches for Sea Reliance.

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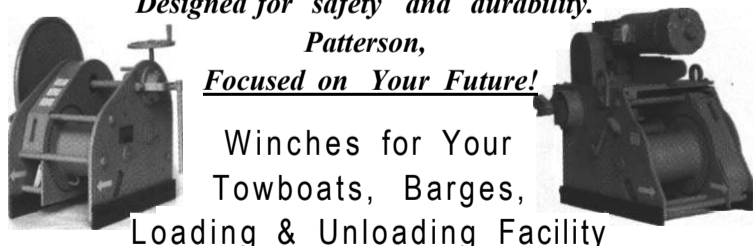
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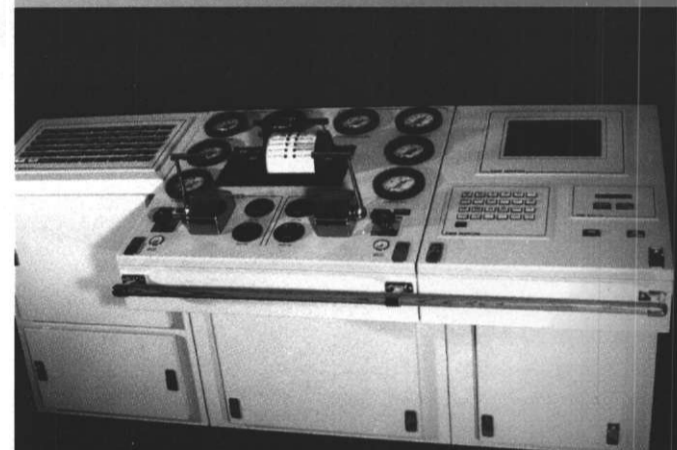
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# Lerchbacker Puts Austal USA on the Fast Track

By Angie Drobnic Holan

When Austal Ltd. of Henderson, Western Australia, started looking last year for a CEO to lead its U.S.-based operations, the job description must have been daunting. They wanted a leader to take the helm of their newly built shipyard in Mobile, Ala., and turn it into a major contractor for both military and commercial vessels in the United States. Austal had recently entered the U.S. market for the first time, intent on competing with higher-profile rivals such as Incat/Bollinger, Derecktor Shipyards and Kvaerner.

The company settled on **Alan Lerchbacker**, 50, an energetic former Navy Aquanaut with a business background, who took the position in February 2002. Lerchbacker had never heard of Austal until a headhunter contacted him. But the more he learned about the job, the more excited he got, he said.

"Austal is very entrepreneurial. They don't have a lot of corporate layers of management and they're very on the edge technologically," Lerchbacker said. "I felt like I'd been training my whole career for this."

The son of Navy parents, Lerchbacker grew up in the Cleveland area before attending the U.S. Naval Academy in Annapolis, Md. Over a 26-year military career, he worked with the Explosives Ordnance Disposal Unit and headed up the Navy's recovery efforts for the doomed space shuttle Challenger in 1986.



Lerchbacker believes in keeping the troops well informed and loyal by dispensing state-of-the-market info via regular "town meetings."



An enthusiastic CEO, the 50-year-old Lerchbacker counts professional volleyball, renovating old houses, and dominating the North American fast craft market as fun.

His shipyard experience included running operations for the 2,200-personnel Naval Shipyard on Guam, as well as overseeing quality and strategic planning for 22 ship repair facilities with a \$574 million budget and 18,000 workers.

After retiring from the Navy, Lerchbacker earned a master's degree in business administration. He went to work for the Metropolitan Water District of Southern California and then a state business incubator project.

Though 50 and a grandfather, Lerchbacker appears years younger and bears a strong if surprising resemblance to Steven, the Dell Computer Dude. In his spare time, he plays professional volleyball and enjoys renovating old houses as a hobby.

Lerchbacker leads a management team that combines equal portions American military and Australian shipyard experience. **Simon Thornton**, a 30-year veteran of Australia's aluminum shipbuilding industry, heads up operations in Mobile. Another Australia transplant, **Chris Pemberton**, serves as Austal USA's vice president of marketing and sales. Rounding out the team as vice president of marketing and administration is **Bill Pfister**, who, like Lerchbacker, is a former Navy officer and Naval Academy graduate. Pfister has private-sector shipyard experience as well: He worked at

Halter Marine's Mississippi operations before leaving to help Austal scout its location in Mobile.

The three vice presidents guided Austal USA for two years before Lerchbacker's arrival. Because of federal maritime laws, Austal had to open a shipyard on U.S. soil in order to sell ships that could sail between U.S. ports. In 1999, Austal selected Alabama, and tax breaks from a city government eager for high-paying welding jobs sweetened the deal.

Another factor in site selection was Austal's partnership with Bender Shipbuilding & Repair Co. Inc., an 83-year-old Mobile shipyard revitalized in recent years by third-generation owner and president **Tom Bender**. Bender's investment in laser-cutting technology has been a boon to both companies, and the shipyard also shares its dry-dock facilities with Austal USA when needed. Bender holds a 30 percent stake in Austal USA, while Austal holds 70 percent.

"Nothing is more important than local eyes and understanding what the local issues and the local dangers are," Pfister said of the partnership.

Since February 2001, when Austal USA opened its boat-building shed, the operation has delivered two vessels and taken orders for four more. The first two vessels sold were not U.S.-flagged, but were bought by Otto Candies LLC, a

Louisiana-based oil and gas support company, for offshore use. Austal's first U.S.-flagged vessel was sold to Light-house Fast Ferry of New York, which operates under the name New York Fast Ferry. The 85-ft. (26-m) ship was scheduled for delivery in October 2002.

The other three announced contracts include a small cruise ship for Island Queen Cruises of Miami, scheduled for delivery in November 2002; a dinner cruise vessel for Cloud Nine of New York, scheduled for April 2003 delivery; and a 141-ft. (43-m) catamaran for Circle Line- Statue of Liberty Ferry Inc. scheduled for June 2003 delivery.

Though Austal USA won't disclose the prices for the vessels, Australian news reports have pegged most of them in the \$12 million to \$15 million range.

One contract the company lost, however, was due to an overly high bid. Austal submitted a proposal for two large car/passenger ferries to be used by the Alaska Marine Highway System, a division of the Alaska Department of Transportation. Austal's designs were fine, project manager **Gary Smith** said, but the price tag came in too high. The Austal bid was about 25 percent higher than the one offered by Derecktor Shipyards of New York, Smith said.

"It was pretty cut and dry, really," he said.

Lerchbacker said Austal sticks by its





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## Workboat Annual

bid. "We feel that with the price (Derecktor) gave, they're going to have a hard time meeting that price and delivering the speed they said they would deliver," he said.

Despite the loss, Lerchbacker said Austal is intent on winning contracts for larger ships. A major expansion at its

Mobile shipyard will quadruple its current covered workspace by May 2003, he said.

The expansion will also allow the company to fulfill any military contracts, which Austal USA is aggressively pursuing, Lerchbacker said.

Earlier this year, the parent company

Austal Ltd. leased a 331-ft. (101-m) catamaran, the WestPac Express, to the Navy's Military Sealift Command for use by the U.S. Marine Corps' Third Marine Expeditionary Force in the Pacific region in and around Japan. The ship, capable of carrying 970 passengers and 32,000 sq. ft. of cargo, needs only a

14-ft. (4.2-m) draft.

One of Austal's primary competitors for military work is the Australian shipyard INCAT, based in Tasmania, which has allied itself with Bollinger Shipyards in Louisiana to fight for military contracts.

While INCAT/Bollinger is considered a formidable team, INCAT has suffered financial problems with its Australia operations and has been recently held in receivership. The company is expected to recover, but some analysts believe the receivership has hurt INCAT's reputation.

"INCAT will probably survive if it can sell just one vessel, but it has lost industry credibility," said Peter Strachan, an Australia-based analyst with the stockbroker D.J. Carmichael & Co.

Strachan follows the parent company Austal Ltd., which is a publicly traded company on the Australian Stock Exchange under the symbol ASB. Last year, Austal Ltd. had revenues of \$194 million and employed 1,700 workers.

Strachan said he expects Austal to continue to do well both internationally and in the U.S.

Austal USA, meanwhile, continues to raise its profile in its new market. Lerchbacker, for instance, is scheduled to appear at the International Workboat Show in New Orleans in December, where he will share the stage with rival Donald "Boysie" Bollinger of Bollinger Shipyards. The two men are billed to discuss partnerships between U.S. and international companies.

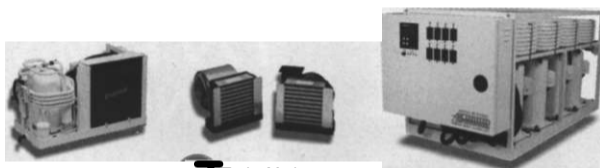
The energetic Lerchbacker said he's eager to take the stage with Bollinger. "I'm going to love it," he said, adding that some of his old Navy buddies have promised to show up for the event.

Lerchbacker said he expects Austal



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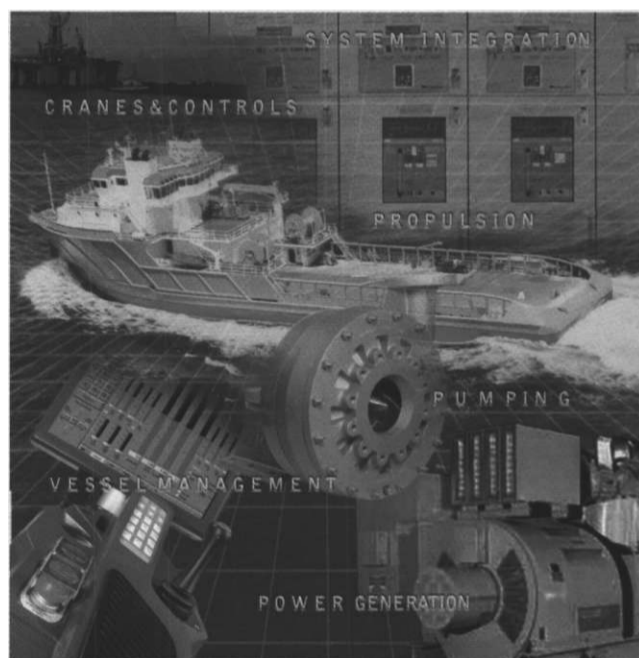
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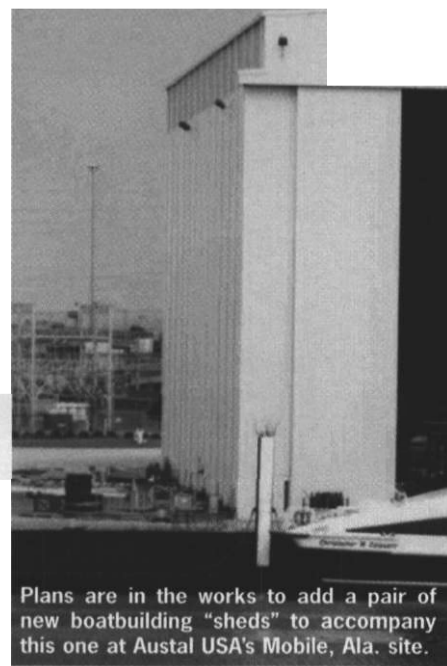


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Plans are in the works to add a pair of new boatbuilding "sheds" to accompany this one at Austal USA's Mobile, Ala. site.

USA to win enough contracts in the coming years that the company will have about 2,000 workers by 2007. The company now employs 120.

He envisions the company handling a mix of commercial and military projects, using the diversity to offset slumps in any one market segment, he said.

Austal Ltd. may be better known in Australia and Asia than in North America, but Lerchbacker hopes that will change soon, he said.

"Globally, it's a very prominent name. It's hard for the Australians to understand that in the U.S., they're a lot of other companies," he said. "But we're getting our brand out. Things are going really well."

### Field of Dreams

*Austal USA is building, and they ... meaning customers and new workers ... are coming.*

With a company built to build speed, one would expect a non-stop flurry of activity to be the hallmark of the manufacturing facility.

Quite the contrary.

Upon coming to Mobile, Ala., in early August to visit Austal USA, a slow, steady stream of new employee applicants was the defining moment.

Early for an appointment with new CEO **Alan B. Lerchbacker, I** sat in the lobby and watched in amazement as one job applicant after another walked through the front door. Make no mistake, Austal's ultra-modern shipbuilding shed and its ubiquitous new leader leave an indelible impression. But that steady stream, particularly in the face of what many describe as a "down" market, was most impressive.

The jobseekers come to Austal USA

for good reason, as the company is in expansion mode. Flush with success in wooing military and commercial buyers, the company is not sitting on the capabilities of its current building "shed" — which is one 262-ft. (80-m) boat or two 164-ft. (50-m) boats per

year — and has invested \$8.2 million for the construction of a new 426-ft. (130-m) boatbuilding shed to flank the current one.

With two sheds, the company expect to support a base of 580 employees, and as **Bill Pfister**, vice president of market-

ing and administration simply put it "As soon as this shed is filled, a third one will go up."

The current goal: 2,000 employees in four years, with a slight majority of business coming from the commercial side. — *Greg Trauthwein*



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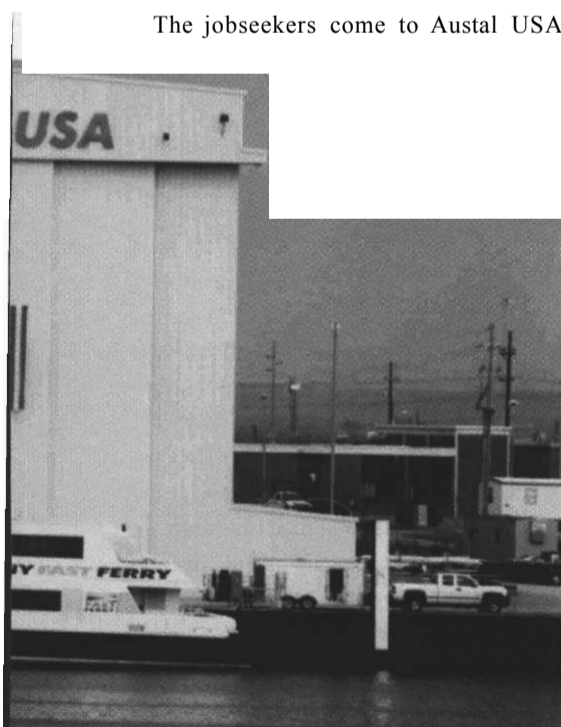
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# Columbian Rope Continues to Hold Strong... After 175 Years

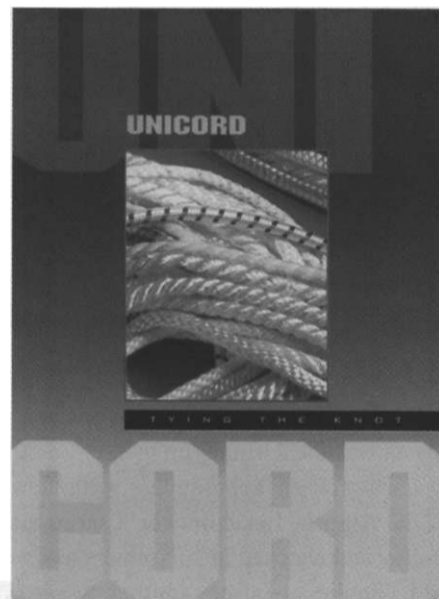
For more than 175 years, Columbian Rope Company has continued to be a driving force and a leader in the rope and cordage industry. During Columbian's existence, a goal of excel-

lence has been achieved, as evidenced by the rate of repeat clients, who continue to inquire about Columbian's products. With four locations (two in the U.S. and two in Mexico), Columbian

Rope enhanced its product base when earlier this year, it became a member of Chicago-based Unicord International — a member of the Unicord Companies.

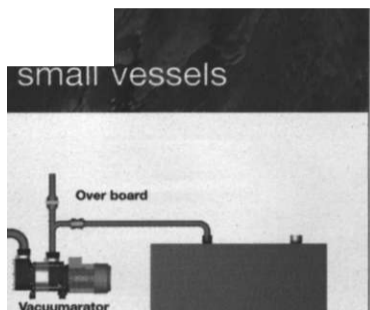


(Above): For more than 175 years, Columbia Rope Co. has held a formidable force within the barge industry. (Below): Earlier this year, the company became a member of Chicago-based Unicord.



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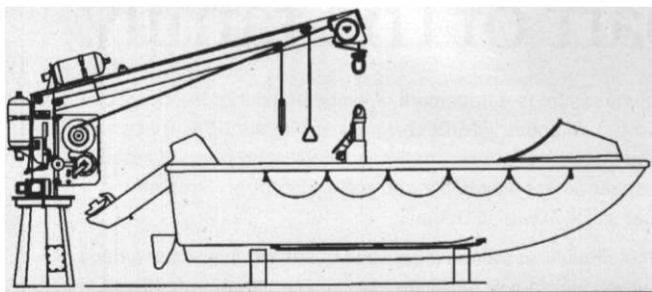
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hauled to New York. The discovery of Nylon Synthetic fiber in the late 1940's coupled with Polypropylene in the 1950's caused a turnaround in product. Bailer Twine was therefore discontinued to provide space for extruding polypropylene, while the implement portion of Osborne was sold to International Harvester and relocated.

During the 1950's Columbian also acquired the Whitlock Rope Company; The R.A. Kelly Company and Cating Rope.

In 1965, Columbian purchased the Plymouth Rope Company, which ended Columbian's expansion program. Business grew and during the mid-1970's, Columbian's focus was a mix of 50 percent natural and 50 percent synthetic rope.

Following a decision that was made to cut back on space, the Sisal production was therefore relocated to Haiti, while the Manila portion went to the Philippines.

The original plant in Auburn was shut down and the building sold - but not before a 225,000 sq. ft. adjacent building was acquired — all devoted to cordage.

During the next few years, competition and imports caused a downturn in the general business and a decision was made to move from Auburn, N.Y. to a more economical business climate. A diligent search turned up space in Guntown, Miss. Named for a prominent gunsmith who lived in the area during the early 1800's, Guntown became the new home for Columbian Rope, where the company continues to serve its many customers.

Early in 2002, the Management and Board of Columbian Rope decided to put the company up for sale, keeping in mind the importance of a commitment by the new owners to continue the great traditions of Columbian Rope.

Chicago-based, Unicord International, a member of the Unicord Companies, recognized the opportunity and proceeded with the purchase of Columbian Rope.

Continuing the traditions that were established by Metcalf 175 years ago, Columbian Rope manufactures — from its four locations throughout North America — ropes, cords, webbings and stretch cords of all types of synthetic materials — from 1/16 to 6-in. in diameter.

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### Halifax Shipyard Introduces AHTS

Halifax Shipyard, launched Atlantic Kingfisher — the first of its two Anchor Handling Tug Supply (AHTS) vessels on September 7, 2002.

Measuring approximately 262 ft. (80

m) with a breadth of 59 ft. (18 m), the Ulstein UT 722L design vessel has all of its equipment installed and is in advanced stages of connect up and testing of the systems. Designed for stand-by rescue, ROV operations, stand-in communications center and multifunc-

tion anchor handling, tug and supply, the vessels have four Bengen diesels.

The deck package is comprised of 500-ton winches, and space for 550 sq. m. and a deck cargo weight of 900 tons.

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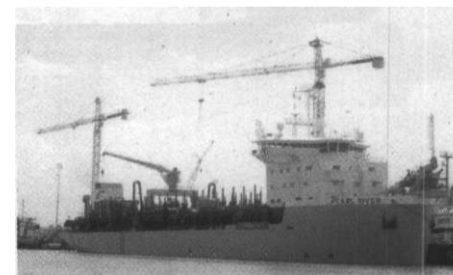
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# Hydralift Skeg Use Gaining Speed

By Chris Martin

A device that increases the efficiency of barges is gaining in popularity on the West Coast, especially for Seattle to Alaska and Southeast Alaska runs. Many people report that Hydralift skegs substantially increase the efficiency of towed barges. This results in either increased towing speed or reduced fuel consumption because the horsepower required to tow at the same speed decreases.

The Lynden Companies, Alaska Railbelt Marine (ARM) and Alaska Marine Lines (AML), have several barges with Hydralift skegs and another currently under construction. They are using the barges on Seattle to Alaska runs and runs within Southeast Alaska. According to **George Williamson**, Senior Port Engineer for ARB, AML, and Bering Marine Corp., the Hydralifts "seem to be [work] as advertised," which is

"increase the [towing] speed or reduce the fuel burned."

Western Towboat Company, Inc., which does all the towing for ARM and AML, has two gravel barges with Hydralift skegs themselves. They use them on all sorts of runs, including a weekly Seattle to Victoria run. Northland Services, Inc, has two barges, which are pulled by Dunlap Towing, on Seattle to Southeast Alaska runs. Foss Maritime has one barge they use for Prince Rupert to Whittier service. There is even one use by Young Brothers in Hawaii. Seaspans International still use one of the three first built, and in fact was one of the original users of barges with the Hydralift skegs.

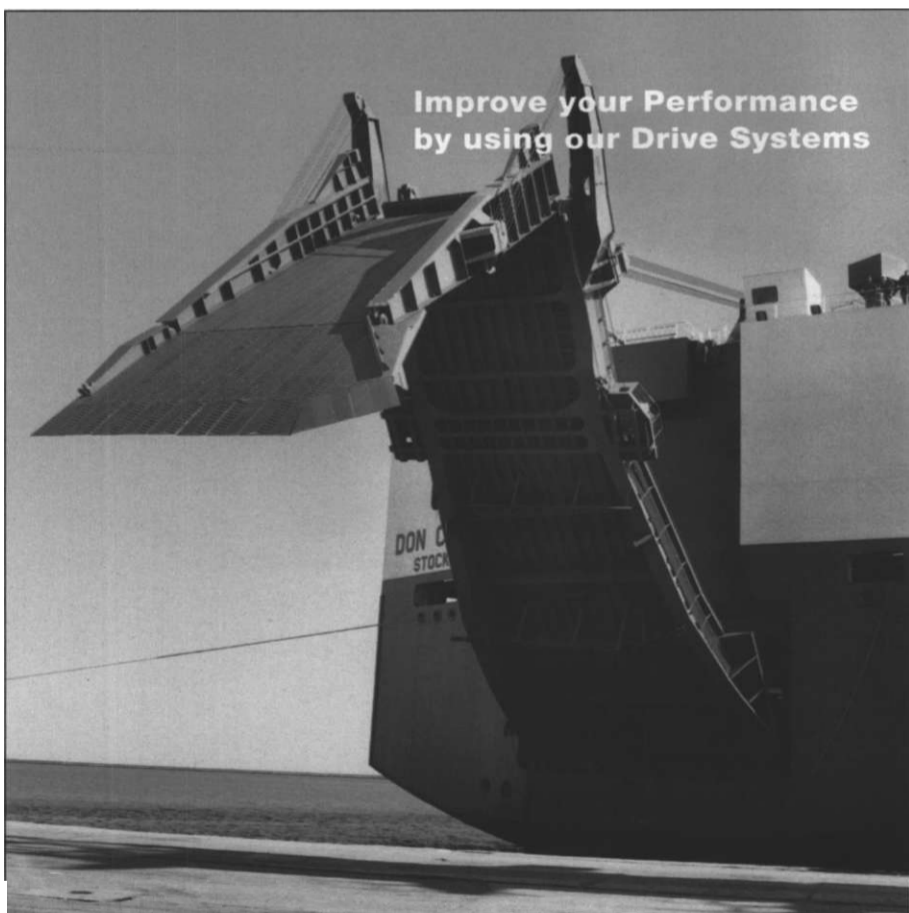
Hydralift skegs were invented by **Joe Gruzling**, president of Nautican Research and Development Ltd. in Vancouver Canada, 20 years ago. In general, skegs are required so a barge will track straight. Just like regular skegs on



Alaska Railbelt Marine railbarge being towed by Western Towboat. (Photo courtesy of Alaska Railbelt Marine).

barges, there are two Hydralift skegs per barge, one on each side-port and starboard, located under the rake. Unlike a regular skeg, which is like a long single hydrofoil, each Hydralift skeg is made up of three narrow foils supported by a

horizontal foil that holds the vertical ones in place. The vertical ones are angled inwards, similarly to a normal skeg, while the horizontal foil is angled downward, almost at the same angle as the rake.



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## Workboat Annual

According to Gruzling, the Hydralift skegs work in a number of ways. They have a much higher aspect ratio than regular skegs, which makes them more efficient foils; that is they have a higher lift to drag ratio than regular foils. Although the horizontal foil was originally put there to increase the strength of the skegs, it also generates lift from the water flowing up the rake. The direction of this lift is not only up, but forwards as well, so it actually provides some thrust. Gruzling says that the vertical foils interact with vortices formed as the water fills in from the sides, also reducing the drag.

There seems to be both scientific and anecdotal evidence that the Hydralift skegs work. **Gerry Stensgaard**, manager of the Ocean Engineering Center at B.C. Research, Inc., a towing tank in Vancouver, Canada, says that when they test barges, they find that normal skegs typically add 30 to 50 percent more resistance over the bare hull drag. From a number of tests, they have found that the Hydralift skegs add 10 percent or less resistance, and theoretically could reduce the overall resistance to below the bare hull resistance. He gives some specific examples: one barge design, in

which regular skegs increase the resistance by 23 percent, Hydralifts increase it by only four percent. He says that these model test results would suggest a



Invented by Joe Gruzling, President of Nautican Research more than 20 years ago, Hydralift skegs add 10 percent or less resistance.

three quarter to one knot speed increase for the same horsepower. Gruzling states says the other way to look at this is the tests predict a 20 percent saving in horsepower for towing at the same

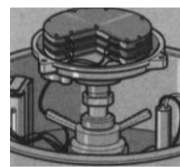
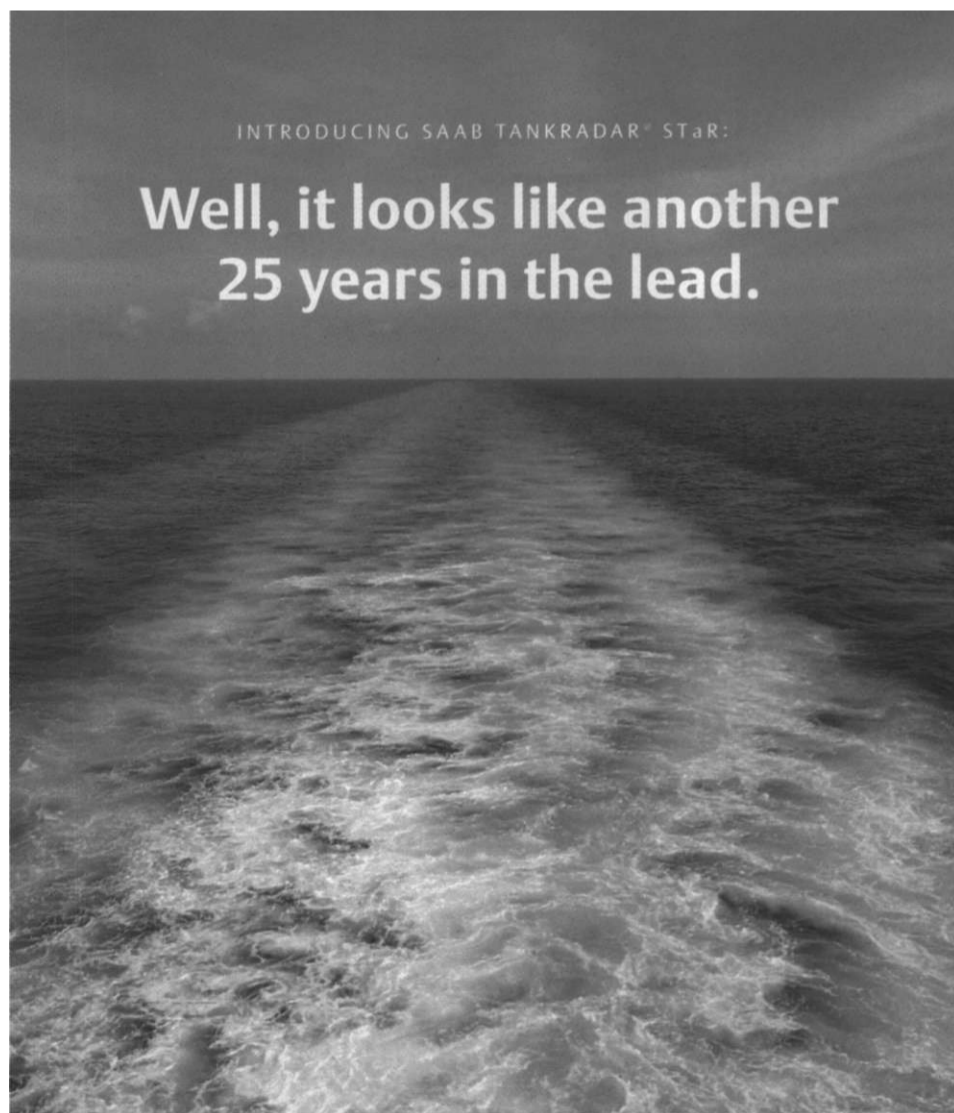
speed. Another example Stensgaard gives is a barge where normal skegs would increase the resistance by 50 percent, the Hydralift resistance reduction

translates into about a two knot increase for the same horsepower.

In the real world, **Bob Shrewsbury**, President of Western Towboat, says that they can get at least a half knot increase

in speed, though they "typically reduce power and tow at the same speed". Interestingly, it turns out that one class of barge that Western Towboat tows for ARM is the first example that Stensgaard gave, where he said the results predicted a three-quarter to one knot increase. **John Armstrong**, VP of Marine Operations at Seaspans International, says that they enhance the sea speed, increasing it by one quarter to half a knot. **Gordon Taylor**, Operations Manager for Dunlap Towing, also says that their "tow speed is a little better, typically half a knot." Others report that one can back off the throttle by 10 percent to make the same speed, which, using a standard propeller curve, compares closely with the tow tank results of a 20 percent horsepower savings. These independent reports seem to give a consistent comparison between real life and theoretical results, that is within engineering tolerance.

The story that Shrewsbury feels really illustrates the performance of the Hydralift skegs involves two Western Towboat tugs: the Western Titan and the Gulf Titan which happened to be side by side in Principe Channel, a straight off the B.C. coast, each with a barge under



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tow. Both have twin 2,260 hp diesel engines on Ulstein Z-Drives turning 100 x 120-in. propellers in Nautican High Efficiency Nozzles, although the Gulf Titan is 12-ft. longer. The Western Titan had a 322 x 90 x 18 ft., 5,000-dwt barge with ordinary skegs on the line, while the Gulf Titan was pulling a 422 x 100 x 25 ft. 10,000-dwt barge that had the Hydralift skegs. Using readings from the CAT EngineVision system to measure fuel flow, he says, "they were making the same speed, burning the same fuel", which he says shows how much more efficient the Hydralift skegs made the heavier barge.

The biggest complaint, though, about Hydralifts seems to be that they act like a huge garden rake and can pick up debris, which slows the barge down. The skegs are required to be cleared using methods such as moving

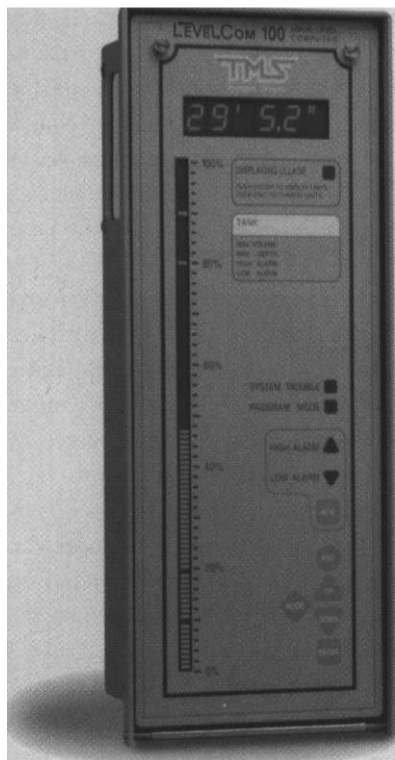
the debris out with a tug's propeller wash, spinning the barge around away from the debris, or backing the barge up.

**John Fowlis**, Hull Superintendent at Seaspan International Ltd., provides some of the other limitations of the Hydralift skeg. At slow speed, less than about three knots, he reports "they tend to skitter all over the place" and that they can wander in shallow waters. He said that they "tend to require a tail boat, especially in current or rivers." Unlike Seaspan, Shrewsbury says that they do not require a tail boat to bring the barge in, but this may be because they make up on the hip (side tow) when bringing the barges in, whereas the Canadians shorten up the towline. Gruzling explains that the loss of control in shallow waters comes from a bottom effect, when the stern rake is too steep relative to the depth of

(Continued on page 88)

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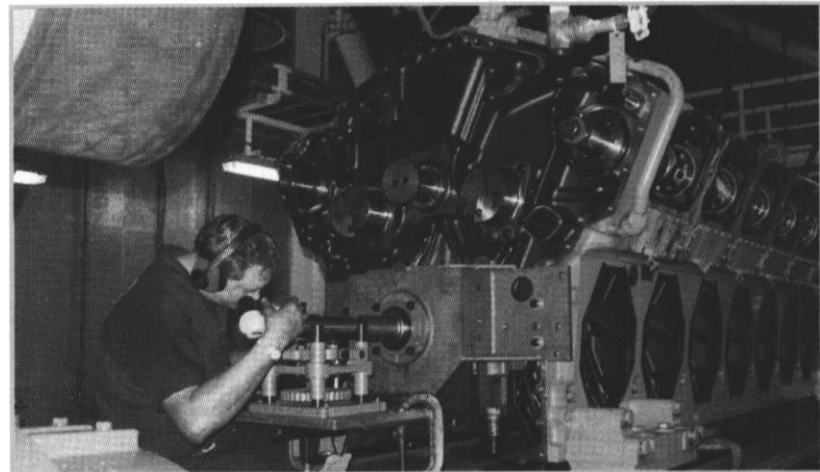
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## A New Generation of Fireboats

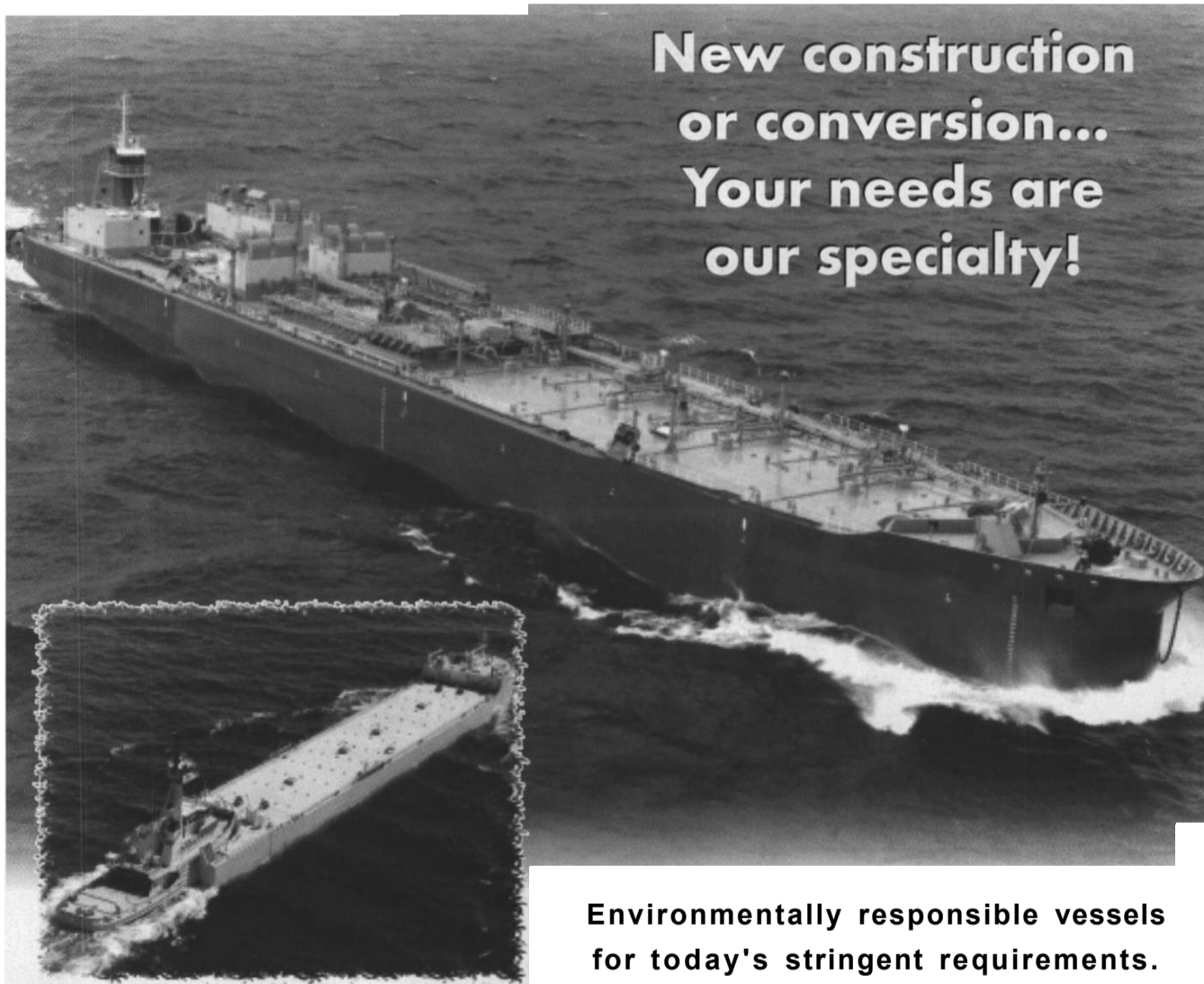
A new generation of fireboat hit the water this June. The NFPA Class 'C' 37-knot speedster exhibited speed, maneuverability and control. She had high pumping capacity and the ability to recover more injured survivors at one

time than boats twice her size. This original design by MetalCraft Marine's **Tom Wroe**, had its concept drawing sketched on a napkin late at night after a long business dinner, where members of the Occoquan, Lorton, Woodbridge Volun-

teer Fire Department (OWLFD) added valuable operational input to the designer's pen. The procurement committee of OWLFD had spent two years educating themselves about what was available in the marketplace, including hull designs, propulsion alternatives, pumping systems and known sea rescue techniques.



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They knew what they wanted, which was everything in a 32-ft. hull. MetalCraft's design team calculated that the boat would not plane out with the extra weight of the fire system and emergency medical gear in a 32-ft. hull. The planing surface area or footprint of the hull needed to have sufficient area with a corresponding horsepower to get the heavy little boat on plane. Optimizing the boat's longitudinal center of gravity, the vertical center of gravity and the boat's meta-centric height were all important operational issues. The roof mounted monitor can put out up to 924 lbs. of force, seriously affecting the boat's righting moment when on the beam. This all meant the boat needed exceptional static stability. The resultant 36-ft. modified deep V hull shape has a moderate deadrise that when combined with its 27,000 lbs. of weight can easily knock down 3 to 5-ft. chop and maintained 20 knots in 7 to 8-ft. seas off the New Jersey coast on her maiden voyage. The boat's weight also affects the boat's breaking ability. Because the jet intakes don't lose their suction when the nose dives during a 37 knot crash stop the boat can stop in one boat length, faster than any truck or car. The oversize Hamilton 322 jets deliver amazing maneuverability. The boat can move perfectly sideways, spin 360 degrees, or sit perfectly still on station with any combination of her three monitors operating at full rpm. The recovery deck can accommodate up to four survivors on backboards at any one time. When the recovery deck is completely loaded there is still approximately 5-in. of freeboard. With the hull design being so radical MetalCraft sought the design capabilities of a reputed design firm. Band, Lavis & Associates of Annapolis, Md., completed a design review for MetalCraft verifying MCM's calculations and design objectives. MetalCraft and specialists of the OWLFD developed a system that was essentially a firetruck system marinized and optimized for weight savings and pumping capacity. The result was 2,400 gpm of flow at 160 psi

out of the Darley 1,500-gpm rated pump. Everything in the fire system was oversized, from the ZF transmission right through to the Akron nozzle. One of the keys to the system is the huge sea chest, large enough that a fireman could actually fit through the bottom of the boat when the flush bottom screen was removed. It was important that the sea chest intake did not disrupt waterflow to ensure that the jet's efficiency was not reduced.

The next design problem was how to get all the extra gear in the engine room and be able to service all this gear easily. Here, MCM's Tom Wroe used his own 300 lb. frame as the test article. All the floor grates, which are retained by spring loaded clamps, lift up to get to any gear below them. One Cummins mechanic was so impressed by the engine room that the dealership's owner had to come down and see it for himself.

When Firestorm left MetalCraft's facility in Kingston, Ontario, the boat had about 14 hours on it. The boat was leaving Kingston for a true endurance trial: 1,000 miles of canal, locks, and open ocean as she headed down the Erie Barge canal, through New York harbor down the eastern shore to her home on the Potomac just south of Washington. She completed the trip in approximately 48 hours of running.

The Cummins 'C' series diesels and Hamilton jets purred the entire way, though they had just come out of the box. The OWL crew now had complete confidence in their new fireboat, Firestorm.

The boat surpassed all of her design objectives and attended her first boat fire the first week she was in service, she performed her first rescue while on sea trials at Kingston. Firestorm is a boat that both the OWLFD and MetalCraft Marine are extremely proud of and sets a new standard for high speed rescue/fireboats.

### Conrad Ends Negotiations With Swiftships

Conrad Industries, Inc. has awarded a new construction program for the Corps of Engineers totaling \$22.2 million which brings the total current backlog to approximately \$33.2 million, excluding

an option for one towboat valued at \$5.6 million. The contract award calls for the construction of three 124-ft. (37.7-m), 3,000 hp, ABS Class towboats valued at \$16.6 million with an option for one additional towboat valued at \$5.6 million. When delivered, these vessels will perform scheduled and emergency

maintenance on the upper Mississippi and Ohio Rivers. Additionally, Conrad has terminated negotiations under the non-binding letter of intent executed August 12, 2002 regarding the purchase of substantially all of the assets of Swiftships Shipbuilders, LLC and Swiftships Technologies, LLC.

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For additional details from the builder and suppliers of this boat, circle the correct number on the Reader Service Card in this edition, or log on to [www.maritimereporterinfo.com](http://www.maritimereporterinfo.com).

<b>MetalCraft Marine</b>	<b>172</b>
<b>Cummins</b>	<b>171</b>
<b>Hamilton Jet</b>	<b>170</b>
<b>Band, Lavis &amp; Associates</b>	<b>169</b>

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**Workboat Annual**

**Alstom Selected By Otto Candies**

Alstom won contract to supply electrical systems for a vessel being built for Otto Candies by the de Hoop shipyard in the Netherlands. The order includes a

simplex dynamic positioning (DP) system from Alstom's 'A' series, plus manual thrusters controls and an independent joystick, for the NB400 offshore support vessel for Otto Candies, which is to be built at the Dutch shipyard.

This DP order comes on the back of an

earlier contract for the same vessel, to supply variable speed drives from Alstom's MV3000 liquid cooled range, plus transformers and motors for the two main 900kW azimuth thrusters. Two of Otto Candies' diving support vessels built by de Hoop — Caballo de Mar and



Caballo de Trabajo — are now in service, having been fitted with Alstom duplex dynamic positioning and electric propulsion equipment. Alstom is also supplying similar equipment for Otto Candies vessels to be built at Houma Fabricators-Shipyard de Hoop in Louisiana and the Bender Shipbuilding and Repair Company in Mobile, Alabama.

"Otto Candies is among the growing number of vessel operators realizing the benefits that a diesel electric solution brings, such as fuel efficiency and installation flexibility," said Paul English, Offshore Sales Manager. "The combination of our new liquid cooled marine drives and DP systems is proving to be an economical alternative in the highly competitive market of workboats and Platform Supply Vessels."

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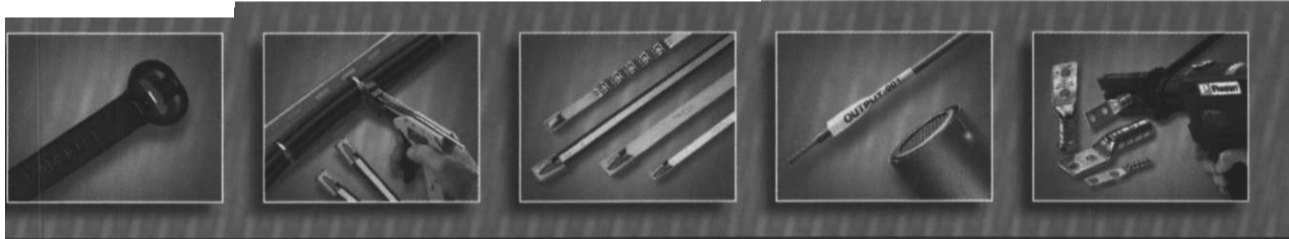
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With the technical support of the manufacturers, TechnoFibre conducts regular professional training courses so that all technicians are updated on the subject of lifeboat systems repair - on a continual basis. In addition, the company had its ISO 9002 quality system accredited by Lloyd's Register in 1999, as well as its various repair procedures being recognized by the major classification societies. Now with an added operation in India, TechnoFibre can offer additional services of liferafts and EPIRB's as well as other LSA equipment, thus providing a comprehensive lifesaving appliance package.

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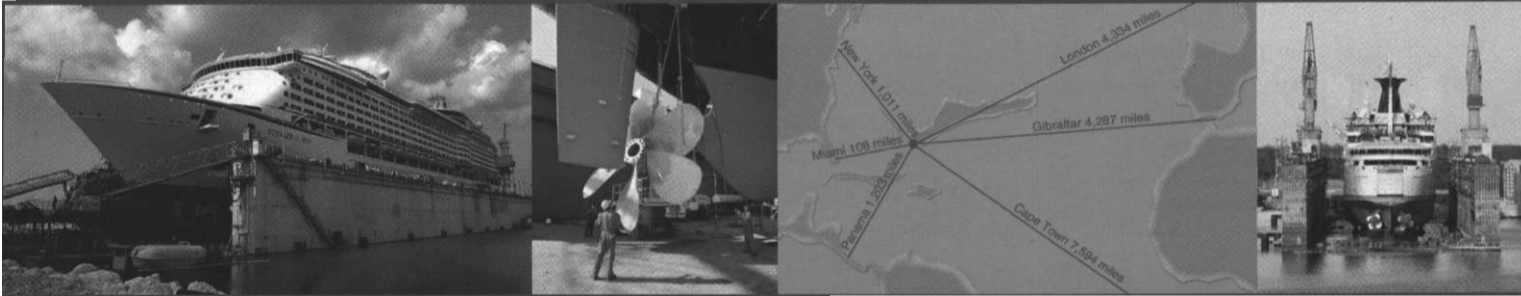
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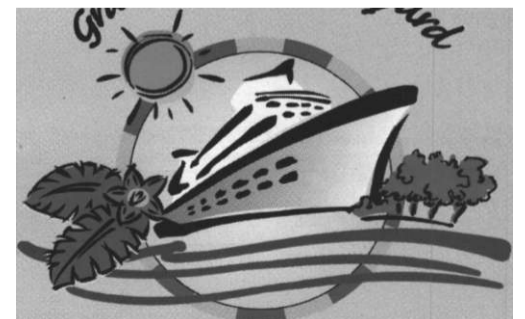
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Vessel draft	9.1m	(30ft)
Lifting capacity	82,500	tonnes



# Maritime E-Business Growth Continues

By Edward Lundquist

E-business means doing business on the Internet. This can include any business process — to include buying and selling, which is known as E-commerce.

The arranging for transport by sea or the buying and selling of things needed for ships that sail from port to port are among the world's oldest professions. Many ship owners, operators or managers still conduct business the old-fashioned way, building and maintaining close and longstanding relationships with suppliers or customers.

While the dot-com craze of a few years ago has passed, E-business is revolutionizing several important business processes in the maritime industry.

Computers can aid in the design and construction of vessels, and the Internet can be used to transmit design information and changes instantaneously. Communication capabilities are expanded

with the web. Equipment sensor data, such as engine oil temperatures and pressures, can be transmitted from a vessel at sea via satellite to be monitored by a company manager or by the manufacturer ashore to determine when maintenance or replacement is required. The chartering of vessels or space for cargo aboard vessels is a process that relies on close and personal working relationships, but has also found efficiencies through web-based chartering applications. Ships require manning; charts; weather; insurance and classification (the establishment and administration of standards) can all use the Internet to be more efficient and productive. With satellite communications and on-board equipment, a ship can now maintain a complete set of charts, and get regular updates.

At the height of the frenzy, some "dot.coms" promised to change the way the maritime industry did business by replacing multiple in-house processes

with their comprehensive web-based applications. The approach was flawed, in that the applications could not do everything, and do it all well. Some sites could tell you the temperature in Tampa, the container count in Calcutta or the latest quote on oil in Antwerp. There are survivors, however, and they are the companies that have added efficiencies and economies to specific functions within the maritime industry instead of replacing them

Just as websites like HotJobs.com and Monster.com help employers and job seekers connect, such specialized sites exist for the maritime field as well.

"Recruitment is placed perfectly to take advantage of the web, especially in an international industry like shipping," says **Phil Parry** of **Spinnaker Consulting** in Essex, U.K., which operates the maritime job site **shippingjobs.com**. "We specialize. We all have maritime backgrounds. We kept the site simple to use and focused on our core business. We've worked to make sure that our registered candidates and infrequent visitors to the site are kept up to date with new vacancies."

Similarly, sites such as **www.maritimejobs.com** have flourished in the U.S.

U.K.-based **Kittiwake**, (which claims that approximately 70 percent of its business is conducted online), performs fuel, oil water and other time-critical sample testing. "Traditional business models are failing. E-commerce removes the barrier to growth," states



**Edward Lundquist is a retired U.S. Navy captain who served as a surface warfare officer and public affairs officer during his 24-year career. He was vice president of corporate communications for e-commerce provider ShipServ, vice president for communication with a large trade association, and is currently with the Center for Security Strategies and Operations for Anteon Corporation.**

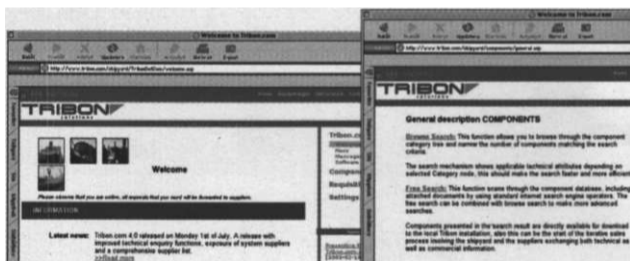
AMOS, deployed in more than 7,000 different applications. AMOS provides a shipping company's "core business enterprise solution."

Oslo-based **ShipNet** offers a variety of software applications from manifesting, container tracking and voyage planning to accounting, purchasing and office management. ShipNet is compatible with purchasing portals, like **ShipServ** and **iShipExchange**. Such integration means the shipping company's accounting software knows when the purchasing system has bought something and can pay the invoice, for example. ShipServ is an application service provider (ASP). You access the software when you log in as a registered user.

ShipServ provides a trading platform and network called **TradeNet** that shipowners and their suppliers can use to exchange the documents involved in the process. Clients can access TradeNet either through their own software, which has been integrated with TradeNet, or the client can log onto ShipServ's applications on the web and use the site's hosted purchasing or sales system.

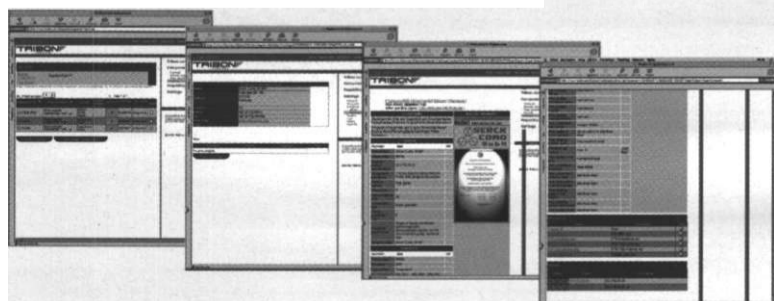
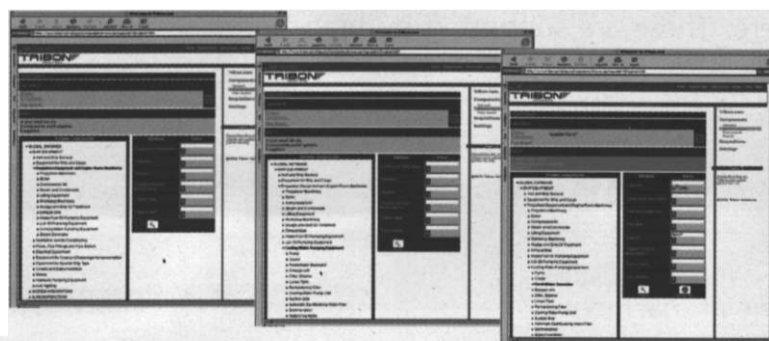
**Paul Ostergaard**, CEO of ShipServ,

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Sweden's Tribon Solutions (**www.Tribon.com**) has been an industry leader in the push toward E-Business, starting in design and information systems for shipyards, and evolving a "marketplace" for its CAD/CAM system. "A designer can select a component and virtually place it into the three-dimensional product model of the ship," said Tribon's **Magnus Feldt**.



**Michael Dines**, systems developer at Kittiwake.

There are applications to help maritime companies manage their businesses, installed locally on their own computers. Xantic offers a system called

www.maritimejobs.com



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believes that e-commerce in ship supply is now a reality: "Our business is mostly about changing the process rather than changing relationships. In most cases the shipowner continues to order direct or seek quotes from his usual suppliers. Today we have 25 ship owners buying from 175 contracted suppliers and a further 800 suppliers have had orders through TradeNet."

Computer aided design and manufacturing (CAD/CAM) has revolutionized ship design, construction and repair. Now CAD/CAM is being integrated with e-commerce.

Tribon in Malmo, Sweden is a leader in design and information systems for shipyards, and has now added a "marketplace" to their CAD/CAM systems. According to Tribon's Magnus Feldt, "A designer can select a component and virtually place it into the three-dimensional product model of the ship."

That gives users access to a lot of information about that component, such as specifications, service availability, presentations about the manufacturer, or detailed drawings. "If the component fits your need, you can order it directly with our 'Tribon.com' marketplace," he says.

"You can extract all design and production information needed to build the ship. The product model can be delivered to the ship owner/operator together with the real ship. As all information on the components and systems will be stored in the product model, this can be used for maintenance and product life-cycle support," says Feldt.

Tribon.com is open, says Feldt, which means it works with any CAD/CAM system. And it is neutral, in that it doesn't favor any particular shipyards or suppliers. Since Tribon's site is a subscription-based service, buying something via the site has no additional line-item charges or commissions.

#### An On-Line Fuel Exchange

The buying and selling of "bunkers," the fuels that ships use, is a multi-billion



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## E-Commerce

dollar market. **OceanConnect** is an exchange for marine fuel, and one of the e-commerce success stories in the maritime industry. "Our technology finds the best deal for buyers and suppliers alike," according to the company's Website.

There were many e-chartering sites

launched a few years ago, but only a few have survived.

**ShipIQ** is a company with an electronic chartering platform that connects the oil chartering community and the tanker owning community. "ShipIQ provides its users with the information, tools and the platform to complete com-

plex transactions online. Charterers can search for vessels meeting their criteria while tanker owners can identify cargo matches for their vessels. After a negotiation is initiated on ShipIQ, the parties are able to complete the deal online, leaving a clear, well-organized audit trail and documentation," says **Bob**

**Conley**, product development manager for Massachusetts-based ShipIQ.

One of the keys to his company's success is not eliminating the middleman. "Our system is broker friendly. We do not 'disintermediate' the broker from the transaction," Conley says. The online approach also improves the accuracy by providing transaction history and documentation. ShipIQ receives a commission from its customers based on the transactions conducted on its site.

While ShipIQ is a neutral service, Conley says his company is backed by Repsol-YPF, the large Spanish national oil company and Global Petroleum, both charterers. "Cargo is king," says Conley. "The cargoes attract owners and brokers to the site." Even the venerable **Baltic Exchange** in the heart of London, has gone digital. According to the Baltic's **Peter Hill**, the 250-year-old Exchange, whose shipbroking members are involved in negotiating charters for much of the world's merchant tonnage, launched its electronic platform last summer. "In addition to providing members with the facility to search for and match ships with cargoes, the system also provides them with immediate access to the Exchange's unique array of freight market indices which are published daily and which reflect the prevailing freight rates for typical vessels on a wide range of standard routes," explains Hill. E-commerce providers make their money by charging subscription fees, transaction fees or commissions. Some provide integration with in-house systems for a few.

For all the efficiencies and economies, few maritime E-business providers have yet to make a serious profit. Some of the highly touted and well-funded competitors of a few years ago have burned through their cash and abandoned the market. Those that have remained have focused on their customers' specific needs. Maritime consultant **John Shearn** thinks the right long-term approach will be a mix of in house e-commerce facilities and external exchanges. "But the key area where buying organizations need to put in major effort seems to be in supplier community management — knowing their suppliers, monitoring their performance and using them better, for which there is a new breed of knowledge management tools addressing the sourcing area."

### Efficiencies for Purchasing

A promising benefit of maritime e-commerce is the streamlining of the



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purchasing process. The present process might be something like this. A ship pulling into port needs supplies, stores and repair parts. The ship's master contacts the ship's owner via ship-to-shore phone or by landline upon arrival in port. This company uses a form for requisitions, and the handwritten order could take up a number of pages. The master will fax it by a long-distance phone call when the ship pulls in. For this example, the company owns several ships, and has a full-time purchasing manager — in this case on the other side of the world from where the vessel is — who receives the requisition. The purchasing manager reviews the requisition to determine whether or not the items were needed right away or could wait until later. Perhaps the ship has a repair period scheduled in the not-too-distant future; perhaps the material will already be available on the pier when the ship pulls in; or maybe the material can be transferred from another vessel in the company. In this case, the purchasing manager decides that the list of items is valid, and must be purchased.

The purchasing manager usually deals with the same suppliers. But his vessel is calling at a port that the company doesn't visit often, so the manager has several options. He can deal with his regular local suppliers and have them ship the material ahead; he can use the company's agents in that port (if they are using an agent) and let them find the items; he can look for a supplier by consulting any or all of the various directories listing suppliers, husbanding agents and chandlers at ports around the world; or the parts may be available through the manufacturers' representatives.

Time is of the essence. The ship will be in port just long enough to unload and load cargo. Any extra time awaiting

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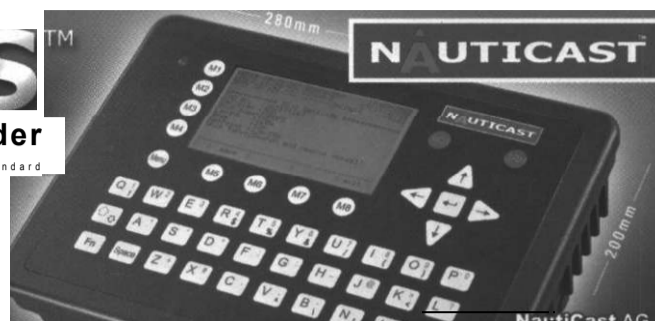
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## E-Commerce

parts will cost the company money. In all likelihood, when the purchasing manager finds someone who can get what he/she needs — he/she won't bother to shop around for a better price.

The search and the subsequent ordering process takes place with costly phone calls and faxes. The resulting records might consist of some files with copies of the orders.

### Standards Adopted

With a web-based application, however, the process is faster, easier and more efficient. The applications vary, but most use an adaptation of the standard language for Internet trading (called Extensible Markup Language or XML) called Marine Text Markup Language or MTML, developed and maintained by the Maritime e-Commerce Association

(MeCA). The association says that MTML is simple to use and is open to any maritime company that wants to conduct e-commerce.

The ship's master can create his formatted requisition on board then send it via the Internet via satellite while underway or via phone lines when ashore. If prepared in advance, it takes only a few seconds to submit (which is critical when considering phone charges). The purchasing manager receives it almost instantly, and since the purchasing office uses the same format, he can selectively review and approve each line item. The requisition can then be submitted as a request for quotation (RFQ) to one or multiple suppliers. The suppliers who receive the RFQ can quote their availability and prices. The purchasing manager can select which items he will buy

and return it as an order. Then the supplier, in turn, can confirm the order and submit the shipping details.

The transaction can be integrated with both the buyer and seller's in-house systems; the transaction data can be useful later on, too. If a company has four vessels, the data can be easily compared to see if one vessel is using more engine parts for example, or more lubricants, which might indicate the need for an overhaul or replacement.

Some ship owners have just one or two vessels and do the management themselves. Other companies are larger, or provide management services to various owners. Eventually, maritime businesses need to automate their functions. There are various software packages that shipping companies can use to manage their operations. This can include

crew assignments and personnel records, payroll, schedules, maintenance and repair, record keeping, purchasing, chartering and more.

For example, **Xantic** has agreements with portals so that purchase orders created with its AMOS system can be submitted to suppliers directly.

"As a result of the partnership between Xantic and the portals owners, users onboard vessels running the AMOS software AMOS M&P will be able to send a requisition to their onshore office, from where the M&P system automatically sends the request for a quote a spare part through to an E-procurement portal. From here, information from vendors (prices, delivery times, part numbers, etc.) will be fed automatically back into the AMOS M&P system. This information can then

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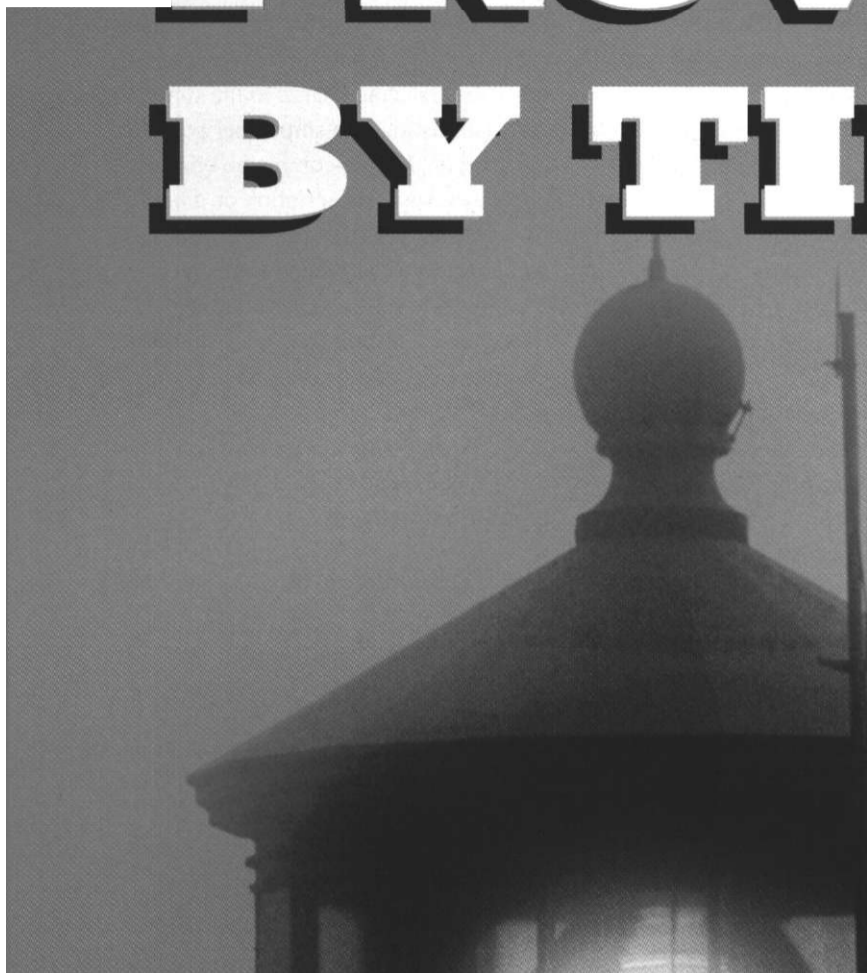
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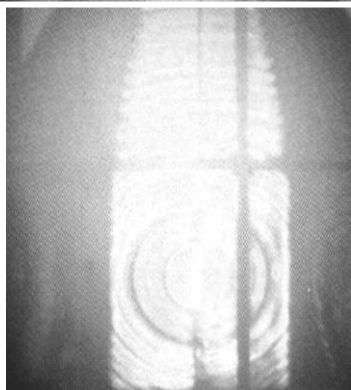
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## E-Commerce

be used to select parts for a requisition or the purchase order. In addition, the information is then stored in the database for future use," reports Xantic in a company press release.

Likewise, suppliers have automated their in-house buying, order fulfillment, accounting and inventory management, too, and can integrate with the portals and buyers using MTML to achieve similar efficiencies.

### Catalogs Go On-Line

There are several catalogs that have become industry standards. The International Marine Purchasing Association publishes the IMPA Marine Stores Guide, complete with illustrations, specifications, product information and comparison tables for all major manufacturers. The Marine Stores Guide has 1,000

pages listing 3,777 commodities and 32,500 different codes.

The International Ship Suppliers Association also has its Ship Stores Catalogue listing 55,000 line items of ship stores.

Both IMPA and ISSA are based in the UK but have members worldwide.

Several e-commerce companies, like ShipServ and iShipExchange have "preferred partnership" arrangements with IMPA, ISSA, or both.

Items can be ordered using either catalog's numbers. Both catalogs are available on CD, with a "shopping cart" feature that enables a master or chief engineer to pick items from either catalogue and create a requisition that can be faxed, emailed or transmitted via ShipServ TradeNet to the owner's purchasing department, for example.

One commercial supplier, Unitor, has a catalog with 10,000 products for shipboard use from maintenance and repair equipment to marine gases and refrigerants.

**The Inventory Locator Service (ILS)** serves as an auction site. Anyone with excess inventory can use ILS in much the same way that E-Bay works for collectibles.

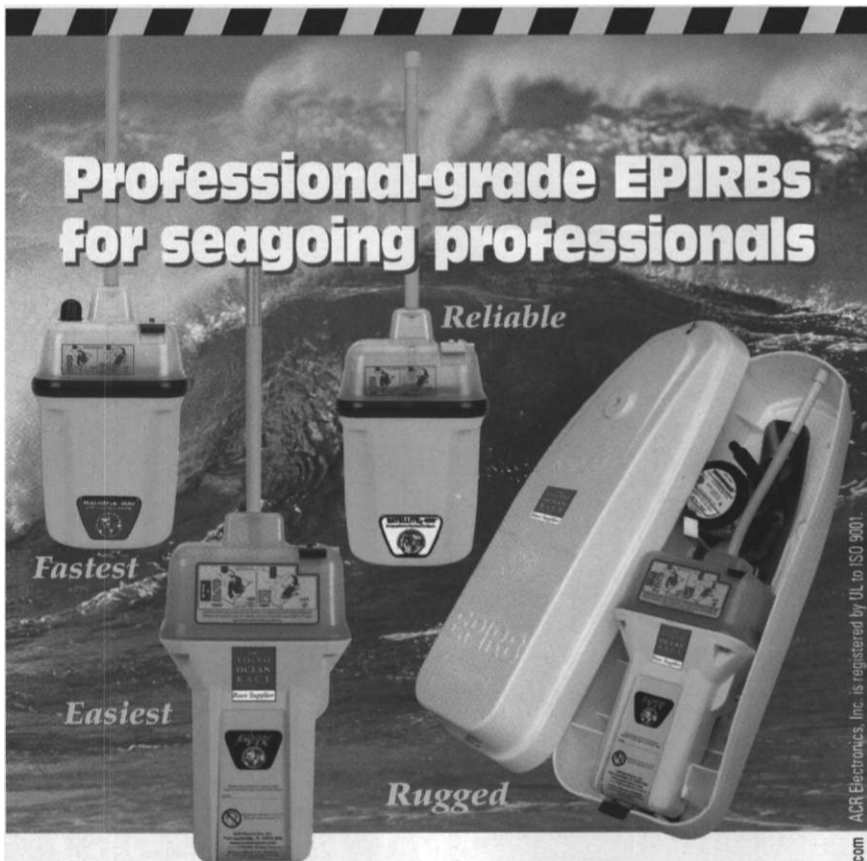
ILS not only supports the maritime industry, but the aviation industry and government purchasing as well. A search for a part can be conducted by a variety of ways, including by National Stock Number (NSN).

Some e-commerce systems charged suppliers a percentage-based commission based on the value of the goods purchased, but this proved to be unrealistic. A one-percent commission may seem

small, but on a \$100,000 winch it can become steep. Some companies charge a straight transaction fee. In the case of the supplier, a monthly fee may also be accompanied by a transaction fee - in the range of \$2 -\$5 — for each purchase order. Some e-commerce companies, however, make no charge to the supplier on the basis that the shipowner pays for the service. Most e-commerce businesses today charge subscription or monthly license fees. In the case of the shipowner this will be related to the number of ships (around \$100 per month).

Despite much promise, some maritime e-commerce companies have flamed out.

Even with the most sophisticated technology, at the end of the day it all comes down to trust and relationships.



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Maritime Reporter & Engineering News

## Wallem, Drew Team to Offer "Total" Solution

Last month, RealMarine Solutions, consisting of the Wallem Group and Drew Marine, unveiled Total Procurement Solutions (TPS), a low-bandwidth, shipboard electronic procurement system. In effect, TPS is the commercial version of Wallem's in-house procurement system, which during the last five years has handled more than 100,000 transactions. Drew Marine will market TPS globally, as well as provide sales and service through its broad international network of offices.

### A Price You Can't Refuse

In order to launch TPS into a marketplace that is currently skeptical of E-Commerce solutions, given the breaking of E-commerce bubble more than a year ago, TPS is offered free during its validation. "We are offering TPS for customer consideration and review," said **Paul DeVivo**, vice president and general manager for Drew Marine. "We have a proven, robust application, and, because of our long-term commitment



Perhaps Wallem and Drew Marine believe the slow and steady win the race, as the tortoise is prominent on brochures for its new Total Procurement Solution (TPS),

containing the application is simply copied onto a vessel's PC hard drive. From this application, a vessel, though automated, government-level, encrypted low-bandwidth e-mail, communicates its supply needs to its home office.

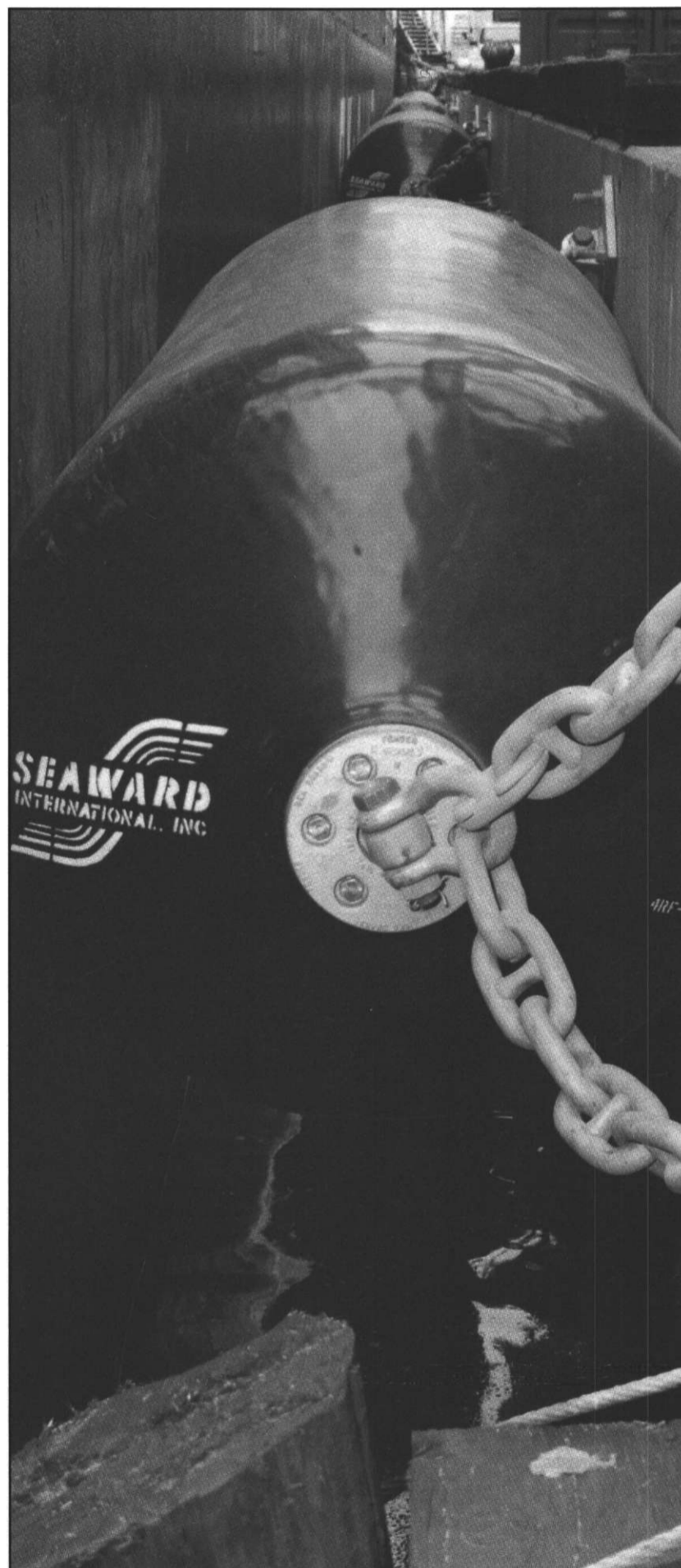
The home office, using a web-based application, approves or modifies the communication and directs it to a supplier. This process, which uses government-level security PKI (Public Key Infrastructure) — is a two-key encryption-decryption system that guarantees the integrity as well as the security of the data. "A rigid security system was critical to us," said DeVivo. "We needed to know that our data would be secure, including pricing, before we released the application for commercial review."

In stressing the security aspect, which

is of paramount importance to the marine industry traditionally, but particularly in light of increased security measures, it was explained that PKI works in much the same way as a safety deposit box, in that two keys or pass-

words are required to access an account.

"People don't realize how vulnerable their e-mail is. Anything you send via e-mail today can easily be read by third parties. We can put a stop to this with Total Procurement Solutions," said



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# Marine Software: Aiming to Lower Costs

Founded by a group of marine engineers in 1991, Marine Software, Ltd. was established with the goal of providing the industry with simple, easy-to-use software. By virtue of the founder's experience, it was sure that the company had a clear insight as to the needs of the industry and intricacies of systems for

onboard use. The company today counts 330 vessels as customers, with others joining the installed base at a steady rate. Existing clients include the U.K. Ministry of Defence, Seabulk International, Global Marine Systems, Reederei Nord, Dobson Fleet Management, Bluewater Marine Management &

Midocean (IOM) Ltd.

All systems produced by the company are manufactured in modules, a tactic that allows customers to purchase only what they need. For example, if the operator requires only Planned Maintenance, then this could be supplied as a stand-alone system. If needs changed requiring stock control, purchasing or project management, Marine Software can easily add these and additional modules, linking them to existing modules with no disruption to the system.

Marine Software recently launched Marine Planned Maintenance Lite for Windows and Marine Storekeeper Lite for Windows, systems that only exhibit the core functionality for basic planned maintenance and stock control. While the 'Lite' systems are perfectly adequate for basic functionality they can, if the customer later requires, be upgraded to the full systems with a simple program change, without the need for restructuring or importing their databases.

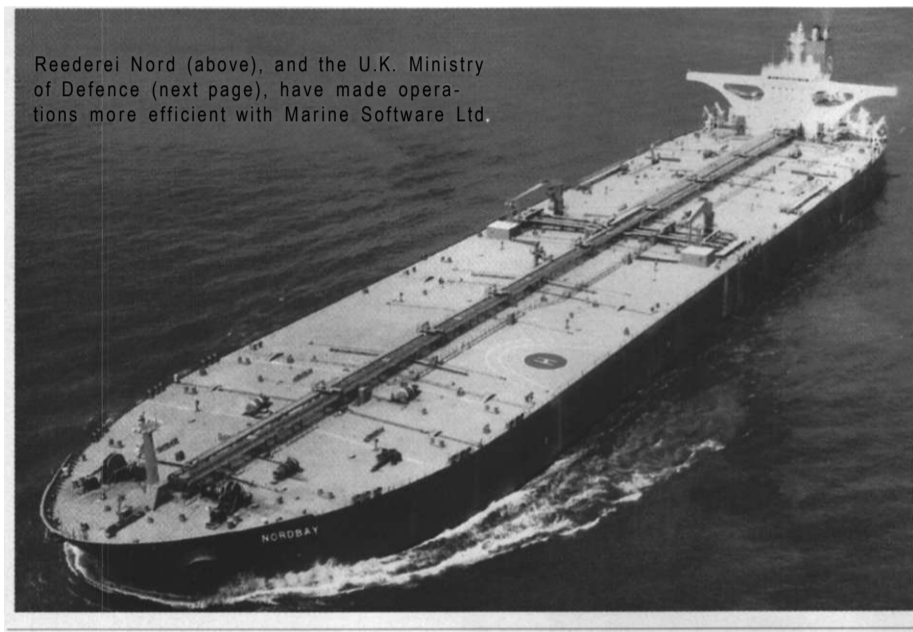
For ship operators, sourcing a planned

maintenance package is only the first part of the task of implementation. The more formidable hurdle is setting up the system for individual ships — a process that can be the most time consuming and expensive part of the project.

## A Helping Hand Down Under

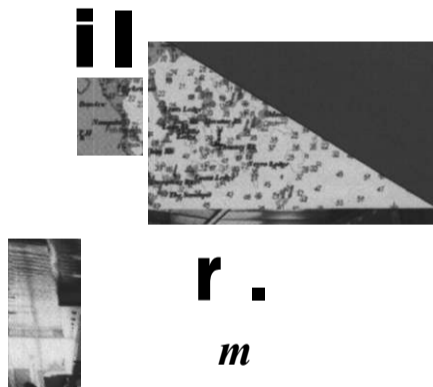
Incat — a leading supplier of fast ferries — needed to supply a standardized planned maintenance package on delivery of each vessel, as Marine Software had already supplied planned maintenance systems directly to the ship operators, Sea Containers and Condor Ferries, for many of their existing vessels. These systems, due to their simplicity and ease of use, had proved very suitable to the operating environment found on board fast ferries, limited manpower, fast turnaround times, high operational work load and frequent changes of crew.

Sea Containers therefore contracted Marine Software to supply planned maintenance systems to four fast passenger ferries operating in New York



Reederei Nord (above), and the U.K. Ministry of Defence (next page), have made operations more efficient with Marine Software Ltd.

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Harbor for Seastreak Inc. Once again a heavy operational load on the operators left them without spare resources to set the systems up, so Marine Software was able to supply a skeleton system from equipment lists and some manuals for the main machinery. Sea Containers technical staff in the U.K. will then flesh these skeleton systems out, liaising with the ship managers in New York for final polishing. Sea Containers technical team will be able to carry out the installation of the systems using their own staff.

#### In the Navy

The U.K. Ministry of Defence, Warship Support Agency, had a requirement for planned maintenance systems suitable for a class of patrol boat sized training vessels, totalling 16. Due to the similar operating environment as on a fast ferry, i.e. small crew, high operational workload, etc., an easy-to-use system was preferred. As much of the routine maintenance for these vessels was to be carried out by outside contractors and, as the maintenance had to be structured in a manner compatible with Royal Navy practice, many changes to the system were commissioned. The actual planned maintenance databases were set up and installed by BAE Systems Ltd., who also undertook the small training requirement at time of installation onboard.

Global Marine Systems Sub-Sea Division operates many remotely operated vehicles (ROVs) and cable ploughs for the maintenance of existing telecom cables and the laying of new ones. Each vehicle together with its control cabin, workshop, and spare gear outfit housed in containers can be deployed, as a unit, either on owned tonnage or suitable chartered tonnage. Also many of the owned and long term chartered tonnage had a requirement to control maintenance on the ROV handling equipment, A-frames etc., and the cable engine and associated equipment which is part of the vessel's outfit, but comes under the

responsibility of the Sub-Sea department. Because of the specialized nature of much of the equipment, the need to have a deep understanding of cable ship operations and the heavy workload of Global Marine's own technical staff, the company employed a consultant to carry out the set-up and installation work on

their behalf. Marine Software, which was selected to supply Marine Planned Maintenance and Marine Storekeeper for 43 systems, was able to modify its products to fit closely with Global Marine's requirements and to co-operate with the consultant to aid with the task of set-up and installation. Many

planned maintenance databases were copied from one system to another and most installations provided inventory data on Microsoft Excel spreadsheets, which Marine Software was able to import.

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# Full Steam Ahead

*New AIS solutions and applications are coming out as you read this report!*

The evolution of AIS solutions is proceeding at breakneck speed, with a healthy mix of traditional names and new faces introducing new and improved products at every turn. The advent of AIS technology is particularly important now, as ports and vessel operators increasingly focus on safety, collecting and analyzing as much information as possible about a given vessel. This year's SMM exhibition in Hamburg proved to be fertile ground for the introduction of new and the familiarization with established AIS systems. The following is a summary of recent news from electronics manufacturers.

During its decade of business, the maritime community has expected and received constant evolution of technology from **Transas**, and SMM 2002 did

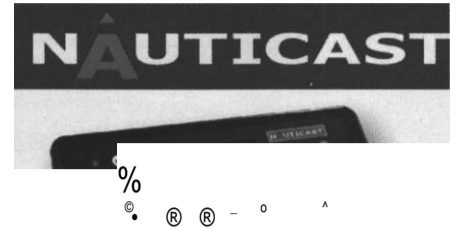
not disappoint. The company held a live demonstration of its UAIS messaging system with neighboring booth **Radio Holland**. During the demonstration two "virtual" vessels each carrying a new-generation electronic chart system exchanged text UAIS messages in the real time mode. Transas and Radio Holland have a long-standing partnership, and the companies have agreed to merge their efforts in promoting the UAIS/Navi-Sailor configuration as the optimal AIS solution.

NSB announced that its worldwide fleet of 77 container ships would be refit with **STN Atlas Marine Electronics'** new Debeg 3400 Universal AIS system, via a contract signed during the SMM exhibition. Developed by STN Atlas and type-approved by the German Bureau of

Shipping and Hydrography (BSH), the fully autonomous Debeg 3400 transmits ship's own data while receiving the same from other UAIS systems within VHF range. Main features include merging of AIS and ARPA target data, in addition to acquisition of target information where no radar contact is available.

For more than a decade, **Saab TransponderTech** has designed, developed and marketed transponders for Maritime and Aviation applications. To date Saab TransponderTech has delivered more than 700 IMO compatible ship transponders to domestic and international customers, and also holds a leading position with land based AIS infrastructure products related to AIS. Earlier this year, the company was first given type approval by Bundesamt für Seeschifffahrt und Hydrographie (BSH) in Germany, on AIS according to the international standards and requirements.

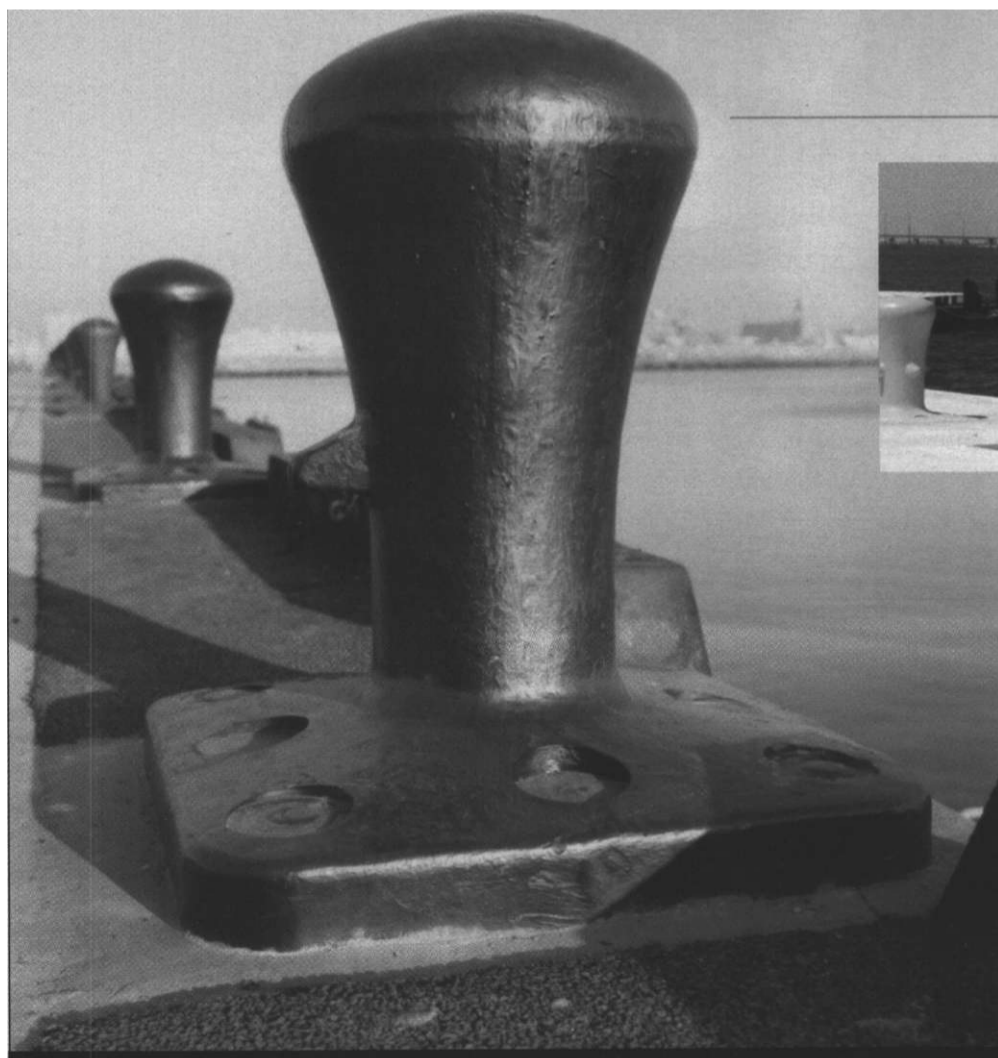
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The push for AIS has resulted in traditional companies and newcomers, such as Nauticast, to quickly engineer shipboard solutions. Nauticast emphasizes not only the technical specification, but its units slim profile and light weight.

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## Marine Electronics • AIS

to gain favor with companies seeking not only a solid technical solution, but also one that takes up the absolute minimal amount of space. The core product of the X-Pack range is the X-Pack DS AIS-Transponder, assembled to ISO 9001 Standard by outsourced production partner Siemens AG Austria. The X-Pack DS AIS-Transponder integrated alphanumeric keyboard to ensure its popularity with space conscious owners.

The X-Pack DS, which interfaces with existing NMEA compatible equipment, automatically and continuously broadcasts and receives static, dynamic and voyage related ship data and exchanges it with other AIS equipped vessels and shore stations within VHF range. The company intentionally created a unit with a compact design - 280 x 200 x 60 mm.

Japan Radio Company's (JRC) AIS product — JHS 180 has been type-approved. It is a shipborne system that is capable of continuously broadcasting ownship information while continually receiving and displaying information being broadcast from other vessels. New technology on the unit includes Self-Organized Time Division Multiple Access (SOTDMA), which allows

increased interoperability while helping to eliminate channel congestion. In addition, the VHF data link allows the AIS to "see around corners," helping to avoid dangerous situations before visual contact is established.

Founded in 1948, and boasting more than a generation of designing communication products for use at sea, **Sailor** offers the UAIS 1800 (Universal Automatic Identification System), a Class A ship borne transponder designed to comply with the IMO Resolutions MSC.74(69), Annex 3, for compulsory installation on SOLAS Convention vessels.

The **Skanti** UAIS 2000 has been developed according to IMO's requirements and fulfils the requirements for Class A ship borne equipment of the Universal Automatic Identification System (AIS). It is designed according to, among others, IMO resolution MSC.74 (69) Annex 3., "Recommendation for performance standard of UAIS;" ITU.R.M.1371 "Technical characteristics for an Universal Ship borne Automatic Identification System"; IEC 61993 Part 2 "Universal Ship borne Automatic Identification System (AIS). Operational and Performance Require-

ments, Methods of Testing and Required Test Results"; and IEC 61162 "Maritime Navigation and Radio Communication Equipment and Systems - Digital Interfaces."

The KDU 2000, Keyboard Display Unit, fulfills the IMO requirements for a control and display unit. However, the UAIS 2000 will typically be connected to more advanced display systems, which may already be installed on board the vessels.

**ObsTek** and its partner **SML Technologies**, manufacturers and distributors of vessel traffic management and port safety systems have already been awarded a contract, and have been approved, by the United States Coast Guard for the demonstration of a Universal Automatic Identification System (UAIS) in the port of New Orleans. The demonstration consisted of two UAIS transponders: one connected to a desktop system and one to a portable system; the demo took place in the spring of 2000. The Coast Guard has solicited public comments on its proposal to the IMO before it presented draft recommendations at an intersessional meeting of the Maritime Safety Committee (MSC) in February. The MSC will meet again in May to

develop amendments to the Safety of Life at Sea Convention (SOLAS) that IMO will vote on at an international conference on Maritime security scheduled for December 2002. The initiatives the Coast Guard is considering proposing range from vessel equipment to increased portside security and would apply to vessels currently subject to SOLAS (vessels over 300 gt engaged on intentional voyages, and vessels over 500 gt on any voyage).

For more information on the companies listed in this report, circle the appropriate number on the Reader Service Card in this edition, or visit [www.maritimereporterinfo.com](http://www.maritimereporterinfo.com).

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## Marine Data Systems Offers AIS Solutions

Marine Data Systems is a South African-based company, 80 percent of which is owned by Transnet, a group of transport related companies. The company is almost focused singularly on the development and manufacture of Automatic Identification Systems (AIS). To ensure that its technology is relevant to market needs, MDS has been actively involved in forums with the leading international authorities in creating the technology standard.

The company is currently launching its third generation AIMS Automatic Identification and Data Management product, which will be compliant with the required international AIS specifications and supported on a global basis. To further hone its products, MDS is participating in AIS projects together with port and inland waterways authorities in various parts of the world, such as the Pacmar Group in Vancouver; AW the Transport Research Group in the Netherlands; and various organizations in the U.K.

### The Next Step

MDS has recently introduced the AIMS Network Software (ANS), in essence the software used to set-up, operate and manage an AIS network. Since the introduction of AIS, the concept has rapidly evolved from the means of a vessel to accurately and automatically communicate position and movement, to one that allows communications between ship and shore, allowing

### AIS Installation Deadlines

The requirement for AIS transponders has been included in the IMO Safety of Life at Sea (SOLAS) Convention V, Safety of Navigation, Regulation 19, Chapter 1.5. Vessels included in the implementation schedule are:

1. All ships of 300 gt and upwards engaged on international voyages;
  2. Cargo ships of 500 gt and upwards not engaged on international voyages;
  3. Passenger ships irrespective of size
- National administrations may, however, exempt ships, which will be taken out of service permanently within two years after the specified implementation, date. The schedule for the implementation of the AIS carriage requirement is as follows:

#### New buildings

- All ships constructed on or after July 1, 2002;

#### Retrofits

- Ships engaged on international voyages constructed before July 1, 2002:
- In the case of passenger ships irrespective of size and tankers of all sizes, not later than July 1, 2003;
  - In the case of ships, other than passenger ships and tankers, of 50,000 gt and upwards, not later than July 1, 2004;
  - In the case of ships, other than passenger ships and tankers, of 10,000 gt and upwards but less than 50,000 gt, not later than July 1, 2005;
  - In the case of ships, other than passenger ships and tankers, of 3,000 gt and upwards but less than 10,000 gt, not later than July 1, 2006;
  - In the case of ships, other than passenger ships and tankers, of 300 gt and upwards but less than 3,000 gt, not later than July 1, 2007;
  - Ships not engaged on international voyages constructed before July 1, 2002, not later than July 1, 2008.

for a more accurate vessel traffic management scenario and further enhancing the safety of navigation. ANS is deployed as a series of Microsoft Windows applications that can be installed on IBM compatible PC. The system has the ability to group certain vessels together in fleets, which typically would be all of the vessels from a specific com-

pany, or for example, all of the tugs in a given harbor. One of the major uses of the system will be for binary messaging, as the system provides a mechanism for external applications to send and receive binary messages.

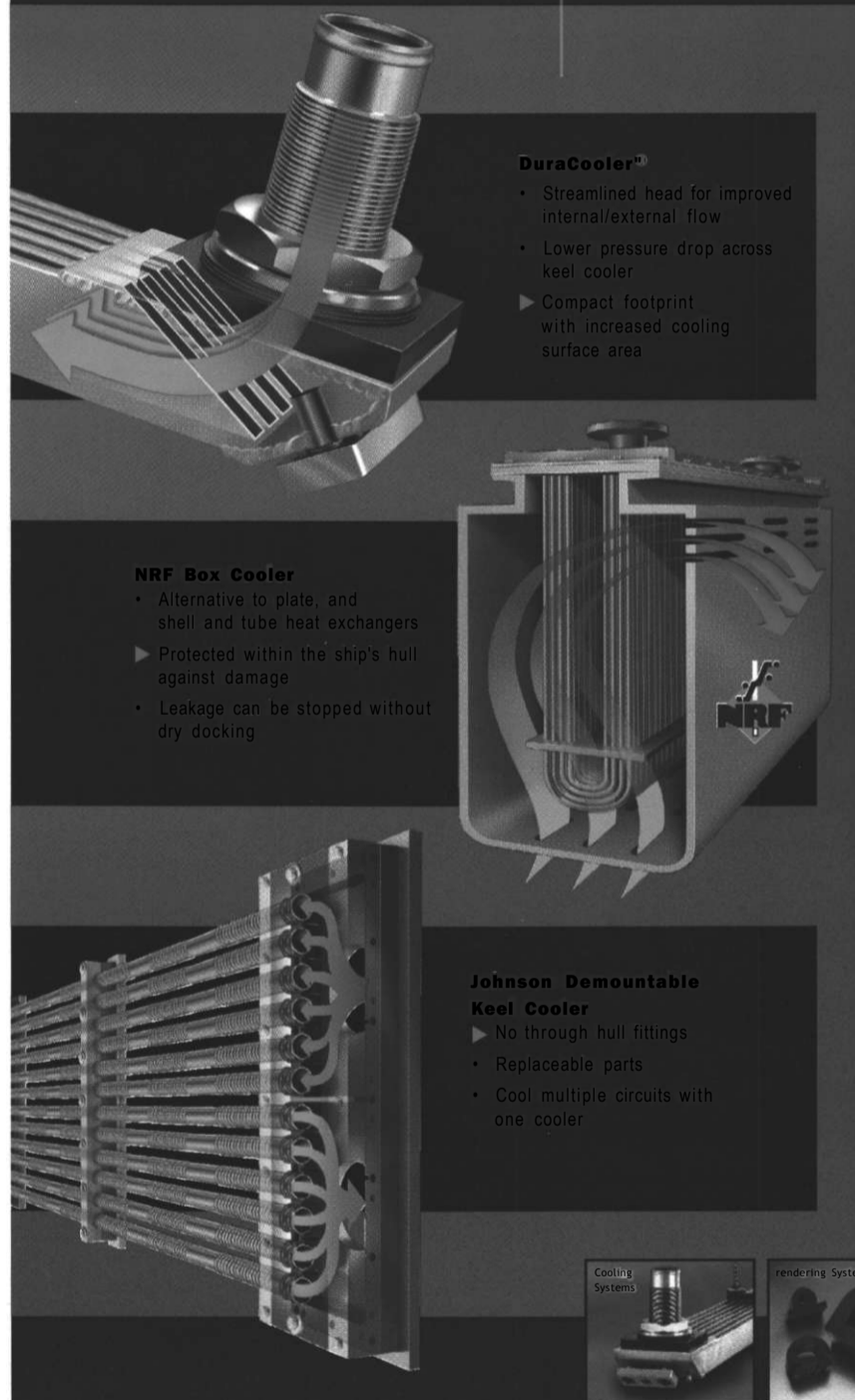
The ANS also has a complete alarm management system networked over any existing network infrastructure and

monitored from a central control. Depending on the type of alarm, acknowledgements can be relayed back to the alarm source.

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Maritime History

# The Holland Project: Leveraging History to Build Tomorrow's Ships

By Dr. Edward S. Popko, IBM; and Gary McCue, Historian/Naval Arch.

In 1932, after rusting in a public park for more than two decades, the USS

Holland was cut up for scrap, a sad and ignoble end for the vessel hailed as the first modern submarine. Beyond sentiment, however, the Holland's unseemly

demise was a historical tragedy. With the ship destroyed and most of the plans used to build it scattered and lost, researchers long believed that the oppor-

tunity to study the innovative genius of the submarine and its inventor, **John P. Holland**, had disappeared forever.

In fact, only three as-built drawings from the original set of 90 Holland plans survived. This was a true tragedy, as The Holland was the first vessel to incorporate all the features of a modern submarine, including: a streamlined hull shape; a fixed center of gravity to ensure longitudinal stability; the first dual propulsion system combining an internal combustion engine for surface propulsion with an electric motor for submerged propulsion; and separate tanks for main ballast, variable loads and trim.

Nearly seven decades later, however, engineer **Gary McCue**, with support from Electric Boat and the Product Lifecycle Management team at IBM and Dassault Systemes, used computerized design tools to bring the Holland back to life in stunning 3-D models and animations. Electric Boat is applying these models to evaluate next generation information technology and to improve its design and engineering practices. The Holland Project, as it has come to be known, illustrates the power of digital archaeology and of using the tools of the future to reconstruct the past. It also offers a rare glimpse into the strategies

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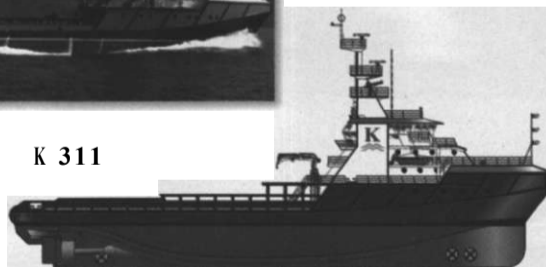
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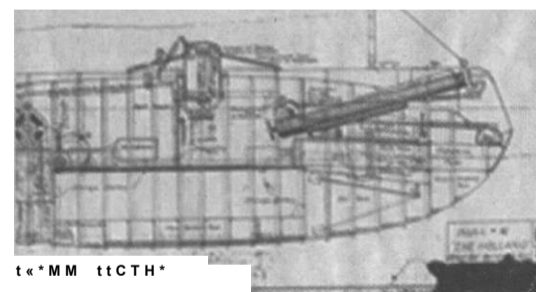
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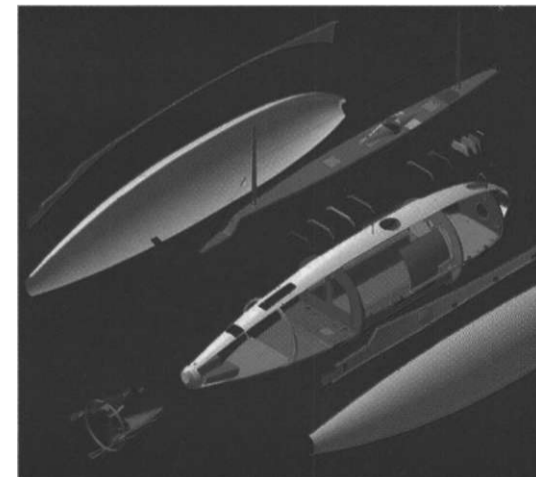
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That was then ... this is now.

Top are some of John Holland's original submarine drawings. Below are two CAD/CAM images resulting from IBM and Dassault Systemes' considerable effort to reconstruct the original plans.

used by today's leading shipbuilders to create the naval, cruise and cargo ships of tomorrow. As such, the Holland Project functions as a mirror of history, reflecting images from the past and projecting them into the future.

Design-in-Context

To re-create the Holland, a concept known as "design-in-context" was employed. Using CATIA software, standard parts were modeled using a local part axis and inserted into an assembly model, where they were placed "on location" by specifying their relationship with surrounding parts. "Place the pump in contact with this mount and line up its mounting holes with the holes in the bulkhead."

The value of this technique was apparent in modeling the Holland, including its 1896 "Otto" gasoline engine and a strange new weapon it deployed called The Dynamite Gun.

The "Otto" design ties 160 parts



together, not by the absolute placements of parts in space but by their relative positions established by constraints — constraints such as contact, parallel, and concentric define how two parts relate to each other. Because all engine parts are constrained in this way, parts that are fully constrained do not move, but those that are not fully constrained move in

accordance with kinematic laws. The result is an operating engine.

John Holland was awarded an 1898 U.S. Patent (708552) for improvements to the Dynamite Gun — and the patent claim included key drawings and specifications, which turned out to be critical for the Project. Detailed drawings included in the patent application helped

fill in what the archive drawings left out, are supplemented by detailed text descriptions of how the device worked.

The relationship between intellectual property and design was important to Holland, just as it is to modern designers and inventors. Digital designs are a valuable asset in documenting intellectual property claims. Every product

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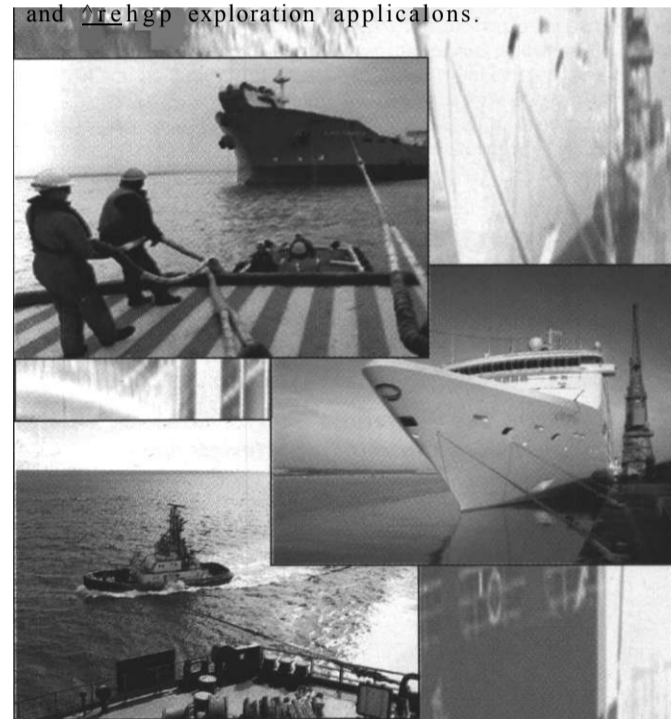
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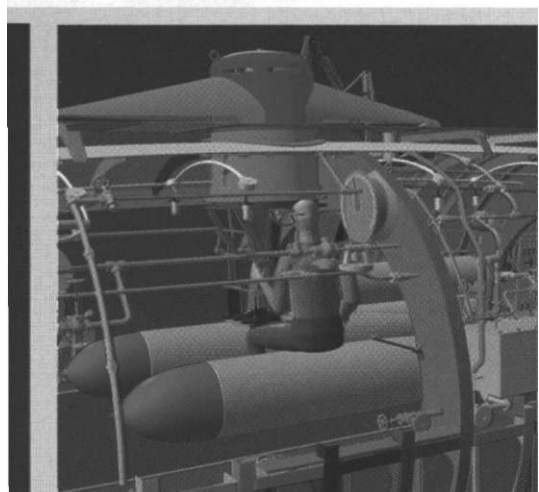
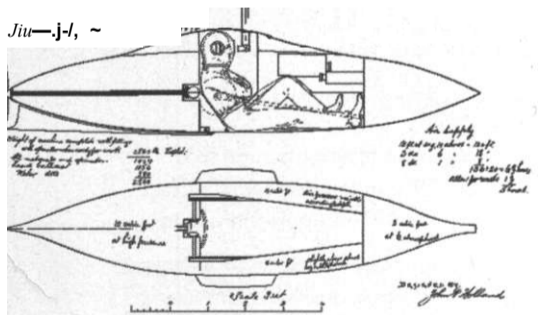
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## Maritime History

design has intellectual property embedded within it, and CATIA multi-model links are effective in keeping resources associated with the models.

### System Behaviors: Incorporating Time and Motion

Now that it has been shown how

CATIA was used to reconstruct the engine and the Dynamite Gun — and how today's designers can use these same principles to advantage in their work — it is time to explore how product lifecycle management helped the team understand the boat's actual operation and its onboard systems. By apply-

ing the principles of kinematics, the team was able to model the behavior of key systems, including the ship's dual propulsion system.

The idea to use different propulsion systems for surfaced and submerged operations dates back to **Robert Fulton**, who combined a hand-cranked propeller

with a sail that folded for submerged operations.

But John Holland was the first to combine an electric motor for submerged propulsion with an internal combustion engine for surface propulsion.

The ship had three modes of plant operation: propulsion by electric motor, propulsion by gasoline engine, and recharging of the batteries using the direct current motor as a generator driven by the gasoline engine. Digital reconstructions of the operation were based on the U.S. Navy's 1903 "Notice on Care and Handling" manual for the Type 7 Holland Submarine Torpedo Vessel.

The complexity and precision of the sequences becomes apparent in these

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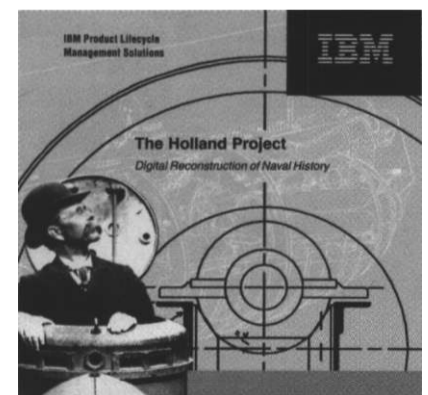
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With IBM shipbuilding solutions, companies can now design a complete 3-D project model even before contracts are signed and the first steel is ordered, and to use that model as the basis for detail design, purchasing, build strategy, production planning, workshop documentation, installation and even maintenance. The system supports online collaboration, which gives everyone on the team, from owners to purchasing, the means to view and markup 3D models using a simple Web browser. (

For more information on IBM:  
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### Free "Holland Project" CD



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simulations, which also indicates how the crew must have interacted as the sequences were performed.

One of the benefits of combining a digital mockup, kinematic definitions for all propulsion assemblies and a time-based simulation tool is that the design and operation of the propulsion plant can be analyzed for completeness. Analysis also identified where the crew spent most of its time, how they worked together and where potential missteps were likely.

**Construction Sequencing**

Shipbuilders must design for production, and researchers were eager to learn about the build sequence, tooling and fixtures that might have been used on the Holland.

This was accomplished using a complete digital mockup (DMU), which gave the team the ability to experiment with "what if" production scenarios.

Unlike today's ships, which are built in large blocks or sections, the Holland was built much like a tract house, with stick-and-frame construction. Photos show us that the main frames were erected over a bottom strake plate and shored up along the side.

Minor wooden spandrels positioned the frames. These were probably attached to the frames with bolts through the rivet holes. Large equipment was positioned inside before the frames blocked access to the interior. Piping, electrical and smaller equipment were added in layers as the frames and hull plates were brought up. In this way, Holland could construct the vehicle while minimizing movements of the main lifting mast and guy wires. The Digital Process for Manufacturing tool was used to simulate the construction process.

Today's shipbuilders are focused on the same efficiencies. Cranes today lift huge block sections of a ship as one. Maximizing the lift capacity, minimizing crane movements and having all materials ready to go is critical to build time.

**Integration and Collaboration**

The ability to create 3-D designs for the Holland — and to test those designs through simulation and virtual operation — illustrates the value of an integrated product lifecycle management solution for today's shipbuilders. Such a solution pulls together information from product description, process and simulation, and for review and commentary — outside the context of CAD/CAM.

It was only in this way that many of the remaining mysteries about the Holland were solved — in much the same way that these same technologies help modern ship designers resolve questions and eliminate conflicts before the first steel is cut.

In many cases, the ability to "watch"

systems in operation represents the only way to recognize and address unresolved issues without incurring massive expenses during the construction phase. This was true in John Holland's day, and it is even truer today. No wonder John P. Holland is considered the "Father of the Modern Submarine."

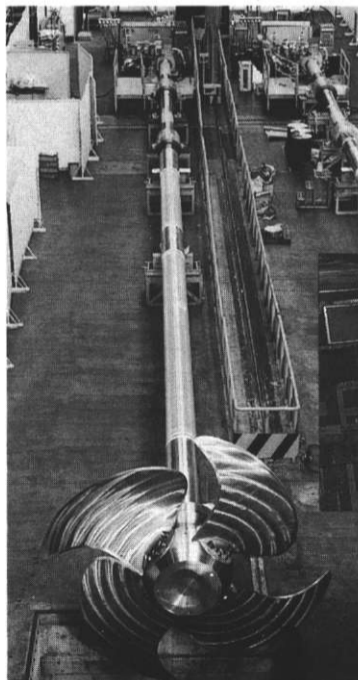
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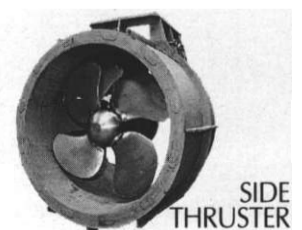


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## Maritime History

# John P. Holland: Father of the Modern Submarine

**John Philip Holland** was an Irish schoolteacher who immigrated to the United States in 1873 to pursue his passion: the design of the world's first practical submarine. Although never formally trained as an engineer, Holland realized his dream on May 17, 1897, with the launching of the Holland VI, the first submarine to combine all of the major systems common to modern submarines in a single vessel. The U.S. Government purchased the Holland VI in April 1900 and commissioned it in October of that year as the USS Holland, the first submarine in the U.S. Navy's fleet. An enhanced Holland design was used for seven more U.S. submarines and was licensed to the U.K., Japan, Russia and the Netherlands, for a total of 24 Holland-type submarines built in five countries by 1905. Germany and Sweden also built submarines incor-

porating Holland's ideas. More than a century later, Holland's basic engineering principles remain the foundation of the world's fleets, and he is generally acknowledged as the father of the modern submarine. Unfortunately, the historical significance of the USS Holland was not recognized at the time, and it was cut up for scrap in 1932. It was long believed that the destruction of the USS Holland would forever deny historians and engineers the opportunity to study Holland's innovations in detail. Today, however, modern computerized design tools have brought the USS Holland back to life in vibrant 3-D images. Through the magic of Product Lifecycle Management technology from IBM and Dassault Systemes, enthusiasts may tour the ship and operate its major systems, while engineers explore the evolution of Holland's design.



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## Anteon Awarded \$20M Deepwater Contract

Anteon International Corporation has been awarded a five-year Blanket Purchase Agreement (BPA), with an estimated value of \$20 million to support the U.S. Coast Guard Integrated Deepwater System Program.

Under this agreement, Anteon will provide systems engineering, life-cycle management and program acquisition support services. These services will aid the Coast Guard during the development and fielding of three classes of new cutters and their associated boats, a new fixed-wing manned aircraft fleet, a combination of new and upgraded helicopters, and unmanned air vehicles.

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## ABS Selected to Class New LPG FPSO

The SPB gas containment system is recognized by industry as effective particularly for liquid gas storage on an FPSO or FSO because of its internal tank stiffening structure and suitability for partial loading. ABS offices worldwide will be involved in the project with engineering services and review being provided by staff in Houston, Texas; Yokohama, Japan; London, U.K. and Hamburg, Germany. Mitsui & Co. Ltd. and IHI have signed the contract for the construction of the SANHA for Single Buoy Mooring Inc. of Monaco. The project will be operated by Sonangol (national oil company of Angola), ChevronTexaco, TotalFinaElf and Agip, and is scheduled for completion mid 2004 - with the first product shipped the beginning of 2005.

## Wynn Marine Teams up with Mayflower Energy

Wynn Marine won the contract to supply the window wiping systems for Mayflower Energy's vessel called The Resolution, featured in the October 2002 edition of MR ("Blowing in the Wind, pg. 36). Wynn is equipping the vessel with 19 Type C wipers from its Ocean Range of wiper systems. This heavy duty internal motor Straight line wiper offers one of the most sophisticated designs of the Straight line wiper system and can wipe over 80 percent of a window. Combined with a fast wiping speed and the correct stroke and blade lengths, the Type C offers clear visibility from the bridge at all times.

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## MAN B&W Revises 32/40 Engine

MAN B&W Diesel Group has revised its 32/40 engine series. Mainly, the engine's soot concentration was reduced under the visibility limit almost over the whole load range. At the same time, the fuel consumption sank. The company

received two orders for the delivery of six 32/40 engines in total. Two 9L32/40 large-bore diesel engines with an output of just under 5,900 hp each will, by the end of the year, be built for the German shipping company Bockstiegel, Emden, delivered to China and installed in two new 502-teu container vessels in the Jingling shipyard, Nanjing. In spring 2003,

MAN B&W Diesel will deliver the engine components for four 7L32/40 (approx. 4,600 hp) to the Spanish licensee IZAR in Cartagena. The engines will propel a so-called RoPax ferry, which will be in service between the Faroe Islands.

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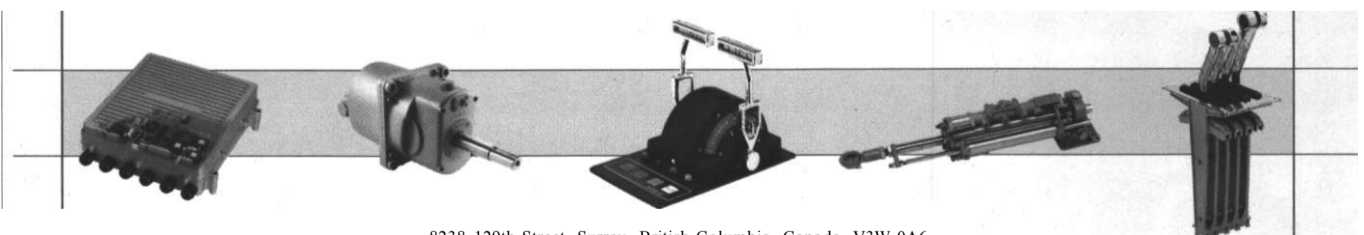


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Make no mistake about it, VT Halmatic would like nothing more than to sweep onto U.S. shores and snap up large chunks of military and commercial RIB business in the coming years. During a recent visit to the boatbuilder's Portchester, U.K. building facility, commercial controller **Sebastian Freeman** could say it no more simply: "Halmatic is always looking for the right partner."

The company, under the Halmatic name solo until being taken over by Vosper Thornycroft (hence the VT) in 1998, has a long and distinguished history of building boats, starting with production of some of the first glass reinforced plastic boats 50 years ago. In fact, the company is the largest builder of RIBs in the U.K., with most of the business coming from the military and commercial lines of business. Relocated to the Portchester Shipyard in 1999, the company today operates from the same shipbuilding facility that built many of the torpedo boats during WWII.

While the Royal Navy is the company's largest RIB customer, it builds boats of various type, size and speed from most all materials except aluminum. The company is also quite adept at exporting, with 60 to 70 percent of its annual turnover coming from outside the U.K. "It is how we survive," said Freeman. Keeping with the theme of this section though the company's RIB design and construction methods have advanced considerably since the introduction of the Atlantic 21 as the


R.N.L.I.'s inshore lifeboat. Throughout this period of evolution Halmatic has maintained its position as designer and builder of the most technically advanced RIBs to fulfil the most demanding mili-

tary, commercial and rescue roles.

Halmatic's current range of RIBs extends from 20 to 40 ft. (6 to 12 m), with both the outboard engine Arctic and inboard diesel Pacifics based on

sea-kind deep V hulls, producing top speeds in excess of 50 knots. The heavy-duty hulls are built from polyester fiberglass or from composites incorporating carbon fiber and Kevlar.

The Pacific 32 is a proven offshore RIB in service with search and rescue organizations as well as super yacht owners. Various layout configurations



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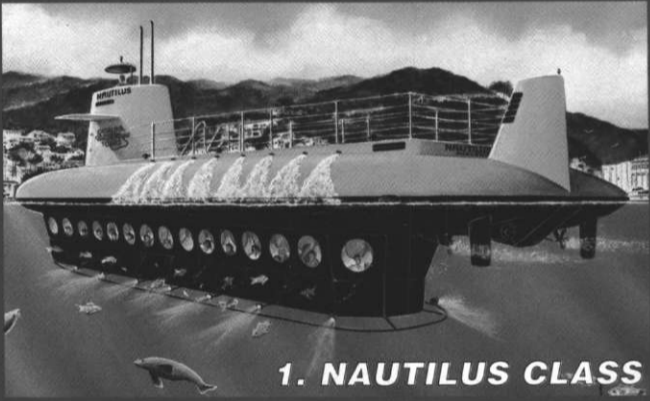
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Halmatic: New MCA Boat Makes a Splash

Halmatic is providing a new fleet of eight boats to the U.K. Maritime & Coastguard Agency (MCA). The fleet is designed to fulfill the MCA's wide operational requirements and will be based around the U.K. The new craft will be built to Lloyds Register of Shipping Rules Report 10 and the MCA Brown Code Category 3 Rules. The Arctic 22 RIBs will be trailer mounted for ease of deployment and will be powered by twin 90-hp outboard motors.

\*Willard Marine GSA Contract GS-07F-0123H

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 3. Aquabus 40' x 49 Passenger Water Taxi  
 4. Septar 56717m Remote Controlled Target Simulator (GSA\*)  
 5. Kingston 32' Patrol RIB (GSA\*)  
 6. Personnel Boat 40713m (GSA\*)  
 7. Sea Force 2477m U.S. Navy (GSA\*)  
 8. Sea Force 36711m Patrol/Utility RIB (GSA\*)  
 9. Sea Force U.S.C.G. SOLAS Approved RIBs (GSA\*)

**RIB Report**

are available including open deck, forward cabin or self-righting wheelhouse variants. Halmatic claims that its 50-knot, 10-seat Arctic 28 is the most powerful boarding boat available in the market place. It operates in substantial numbers with the U.K.'s Royal Marines for marine counter-terrorism operations and with leading European, African, Middle

Eastern and Australasian Special Forces units. A variety of sophisticated navigation and communication equipment is available together with weapon systems and boarding ancillaries. The Arctic 28 is both road and air transportable and air-deployable.

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**Almar Boats**

Almar of Tacoma, Wash., recently completed a two-boat contract for Seatow Brunswick of Brunswick, Ga. Almar was chosen for the job for its ability to produce large diesel/water jet propelled rigid inflatables. These two vessels were the largest of the class to



date, and they reportedly exceeded the customer's specification in terms of speed, handling, ride and noise levels. Both boats will be in service by early November.

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**Main Particulars — Seatow**

Owner	Seatow Brunswick
Length	35 ft. (10.6 m)
Beam	12 ft. (3.6 m)
Hull	25-in. 5086 Aluminum 24-degree deadrise aft
	Hull, foam filled with 2 lb. Polyurethane
Cruising Speed	30 knots
Top Speed	40 knots
Engines	(2) Yanmar 6LY
Power	370 hp (each) at 3,300 rpm
Propulsion	Twin Hamilton 274 jets
Throttle/Jet Controls	Quicksilver
Transmission Control	Morse
Tubes	28-in. diameter, with 7 chambers
Radar, Depth Sounder	Furuno
Radios, Loud Hailer	Standard
Direction Finder	Simrad
Plotter	Garmin
Autopilot	ComNav
Searchlights	ACR
Hydraulic Steering	Jastram

**SeaArk Marine**

SeaArk Marine, Inc., delivered a multi-boat order for Naval Sea Systems Command. SeaArk's 2810 - V Dauntless, designated the Harbor Security Boat (HSB) Medium, the first of several boats delivered to the Pacific Fleet. It features a 20-degree Radical Vee Deadrise Hull. The Dauntless reached a top speed of 38 knots during trials.



27-ft. Commander Class RAM.

Several of SeaArk's 27-ft. (8.2-m) Commander Class RAM, designated the Harbor Security Boat (HSB) Small, were ordered by Naval Sea Systems Command and will be delivered to the Atlantic Fleet. Powered by twin four-stroke outboards, the Commander RAM also has a foam filled, air cushioned collar for boarding and shouldering.

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# Willard Ready for Defense, Commercial Contracts

Willard Marine, Inc., which is a leading builder of RIB's and other small craft for the U.S. Government, delivering more than 900 military boats during the past 20 years. The company's factory is in Anaheim, Calif., with waterfront for sea trials, testing and commissioning



located in Long Beach, Calif.

Based on this experience, the staff at Willard Marine understands the importance of the relationship between the boat, and its crew, mission and payload. Willard Marine is the primary boat builder of FRP RIBs and boats for the U.S. Navy, as well as builders of U.S. Coast Guard craft, pilot boats, water taxis and other boats for the tourist industry. Currently four principal sizes of Willard RIB's are being delivered for force protection, mobile security, homeland security and Navy ship's boat use.

Willard Marine (11-m) RIB in Atlantic waters.

Most RIB's delivered are now being equipped with a force protection package of equipment, and designed and tested for C-130 air transport certification.

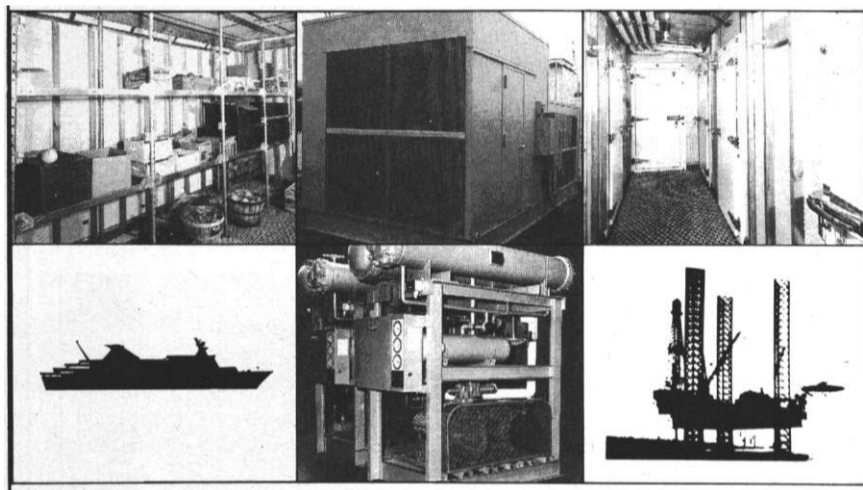
The flagship of the Willard RIB line is its heavy weather, versatile 36-ft. (11-m) craft with twin diesels (up to 440 hp per engine), water jet or propeller propulsion, and construction available in FRP or welded aluminum, with or without full cabin enclosure. The wide beam of this RIB allows seating of up to 30 persons, or a very large area forward or aft for mission equipment and cargo. This RIB has been contracted as the ship's boat for the new Navy LPD-17 class of

amphibious assault ships for the Marines. (See photograph)

Next in the RIB line is a 32-ft. (9.7-m) Harbor Security Boat, which presently when delivered are immediately loaded into C-130's and flown to the Middle East for force protection duty. These RIB's have full cabins, which are quickly removable and stowed on the aft deck during air transport. Each RIB has a force protection package, which includes four gun mounts and full electronics.

Also in Willard's line of RIB's is the U.S. Navy standard 23-ft. (7-m), which is carried aboard most naval ships. Cur-

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# Griffon Hovercraft Scores Big Contracts Around the World

Griffon Hovercraft, powered by diesel engines and built to international standards, are designed to accomplish nearly any task. The company offers a wide and



First of five Saudi Arabian Border Guard (8000TD) hovercraft.

versatile line (please see chart) of amphibious fast craft, which are designed for a long service life operating over deep and shallow water, land, mud, sand, ice, weed, debris, swamp, rocks and rapids.

The company enjoys a variety of customers as broad as its product line, and has won a number of recent contracts. For Shell Petroleum Development Co. of Nigeria, Griffon will supply three twin-engined 3000TDX MkII hovercraft, each able to carry 30 to 36 people plus luggage at a cruising, full-payload speed of 40 knots. Powered by two 525-hp Deutz BF12L513C diesels, the craft will operate mainly in the ferry and logistics support role in the debris-strewn rivers of the Niger Delta.

The Royal National Lifeboat Institution (RNLI) — a voluntary organization responsible for all sea rescues around the coasts of the British Isles — bought a Griffon

450TD, a six-seat unit to be used to rescue people in areas where RNLI's other boats cannot reach, including areas of very shallow water, mudflats, sandbars, rocks, ice and swamp. The 450TD can achieve speeds of more than 30 knots, powered by twin Volkswagen 75 hp automotive diesel engines driving twin air propellers. RNLI currently operates 307 conventional lifeboats from 224 lifeboat stations around the coasts of the U.K. and Ireland.

Griffon Hovercraft has found a strong buyer in the various coast guard agencies of the world, including in Sweden and in India. For the former, Griffon delivered a pair of 2000TDX units to be based in Lulea and Umea on the North East coast of Sweden. The two boats are powered each by a pair of Deutz BF8L513LC diesel engines, which develop 355 hp each. Featuring a one-ton pull winch, both of these craft have a slightly



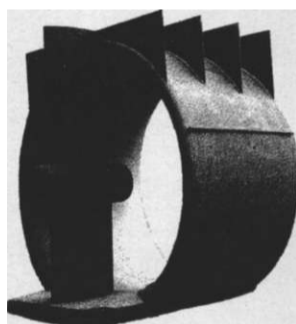
Griffon 2000TD with the Estonian Border Patrol.



Typical instrumentation and controls in 3000TD, 4000TD and 8000TD hovercraft. Note the joystick control.

## The Griffon Hovercraft Line

Model	375TD	450TD	1000TD	2000TD	3000TD	4000TD	8000TD
Length (m) hovering	6.6	7.6	9	12.7	18.4	21.2	21.2
Beam (m) hovering	3.4	3.4	4.7	6.1	10.1	10.1	11
Height (m) hovering	2.25	2.25	3.05	3.93	5.34	5.34	5.52
Passengers	4	5	8-11	20-25	36-42	54-66	63-80
Minimum	1	1	1	1	2	2	2
Speed at full payload	25	30	27	35	37	35	40



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## Willard Marine

(Continued from previous page)

rently these RIB's also are being equipped with a force protection package including a gun mount that attaches to the forward bow post. Power is a single diesel engine with outdrive propulsion, and over 200 have been built by Willard for the Navy.

Rounding out the Willard RIB line are the 16-ft. (4.9-m), 17-ft. (5.4-m), and 22-ft. (6.7-m), which are built as SOLAS Rescue Boats and which have U.S. Coast Guard Certificates of Approval. The 17-ft. (5.4-m) is currently also under contract by the U.S. Navy as a ship's boat.

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raised wheelhouse, affording a 360-degree view. The hulls are 50 percent thicker than the standard craft from Griffon, for over ice operation. Two long "skids" on the bottom of the hull assist the craft in "skiing" over the higher ice ridges. For the Indian Coast Guard, Griffon delivered six 8000TD(M) hovercraft to be used for anti-smuggling and anti-infiltration. The vessels have a top speed in excess of 50 knots with a payload of eight tons, and are armed with .5-in. machine guns. In a unique arrangement, two of the vessels were manufactured at GHL's new boatyard in Southampton, and four were to be assembled from completely knocked-down kits (CKD's) by Garden Reach Shipbuilders and Engineers in Calcutta. All of the Indian Coast Guard boats are powered by two 800-hp, water-cooled MTU 12V183TB32 diesel engines.

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### AB Inflatables

The 10.5 ft. (3.2-m) Oceanus 3.20VSC from AB Inflatables is a sporty RIB with a deep V hull construction large, 17-in.-diameter tubes, and a rounded, European-style console and seat. In fact, the company has redesigned each boat in the Oceanus line to be even more attractive and distinctive. To add to the fresh new look, nylon lifelines have been replaced with long-lasting, dark gray hypalon fabric handles, carefully placed for ease of grip and functionality. The boat has a 5.5 ft. (1.6-m) overall beam and 7.5 ft. (2.2-m) interior



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Suggested retail price of the Oceanus 3.20VSC is \$5,995, without engine.

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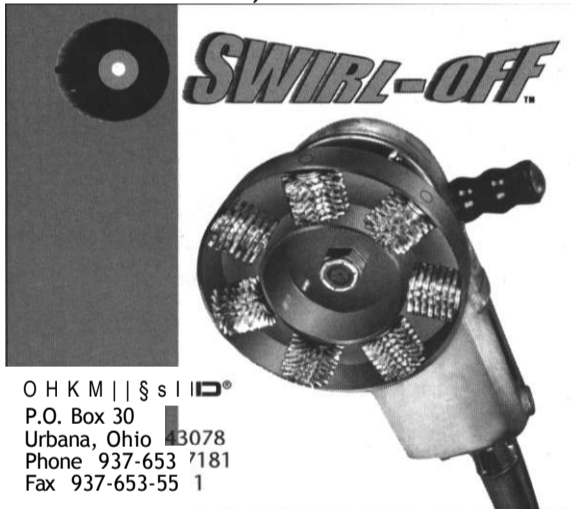
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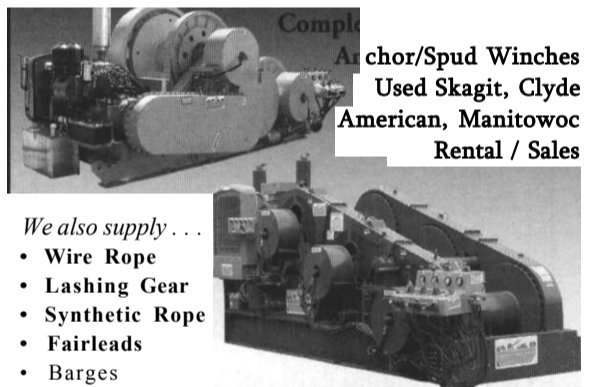
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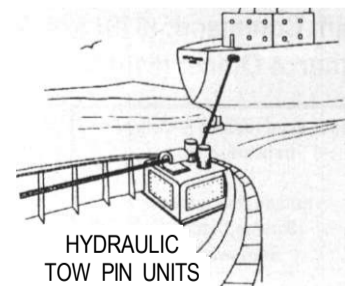
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## RIB Report

### Ribcraft

Ribcraft USA offers a stable of RIBS - 16-ft. (4.8-m); 19-ft. (5.8-); 25-ft. (7.8-m) and 29-ft. (9-m) — that are designed for a wide variety of military, law enforcement and commercial applications. In 15 years the company has more than 1,000 operating hulls, and it is able to design customer experience into each new boat. The company's 25-ft. (7.8-m) model is designed as a commercial rough weather boat, an offshore RIB able to transport crew and equipment in the harshest conditions. It has a long steep sheer towards the bow to provide superior performance. The boat, which allows for a maximum 400-hp, is configured to allow for any number of customization features, to ensure that the boat is 100 percent prepared for its given task. The standard tubes on the



29.5-ft. (9-m) specifications

Length, (o.a.)	29.5 ft. (9 m)
Beam	10 ft. (3 m)
Dead Rise Forward	29 degrees
Min. HP.	150 hp
Max HP.	450
Internal length	26 ft. (7.9 m)
Internal beam	6.5 ft. (2 m)
Tube Diameter	21 in.

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### Ribcraft 9-m

The 9-m (29.5 ft.) RIB from Ribcraft is designed to be a true workhorse, and is the flagship of the Ribcraft fleet. With a classic high bow sheer and convex warped hull, the boat is powered to a maximum of 450 hp and is designed to carry personnel and cargo safely in a variety of conditions.

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### OTECH

OTECH has recently built and delivered 19 Ocean Sprint 23-ft. (7-m) fiberglass RIBS to the U.S. Navy, Naval Sea Systems Command. Each vessel is driven by a Cummins 6BT inboard diesel engine with Mercruiser Bravo outdrives. OTECH also offers SOLAS/USCG models in 16- (4.8-); 18- (5.6-); and 23-ft. (7-m) sizes.

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### Protector

The Protector range of RIBs are designed as multi-purpose vessels to serve military and workboat requirements worldwide, featuring a conven-

tional Deep-V hull. With models ranging from 22 to 40 ft. (6.7 to 12.1 m), the boats can be deployed as a rapid response vessel in extreme conditions. They are capable of being highly maneuverable in the rescue of personnel in emergency situations. The Protector 28 ft. (8.5 m) RIB is a Rapid Response vessel, designed to be highly maneuverable in extreme weather.

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### Zodiac

Zodiac unveiled Armorplate (patent pending), an inflatable bulletproof sys-



tem for inflatable boats, which inflates in about 40 seconds to protect troops and inflatable tubes from gunfire. The Armorplate system shown is installed on the Zodiac F470 CRRC (Combat Rubber Raiding Craft), which is used by military and special forces operations worldwide. (Photo credit: Bob Wheeler). The inflatable Armorplate system made its debut on the Zodiac F470 CRRC inflatable boat, which has a long history of military and special forces operation.

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### Aluminum Chambered Boats

Aluminum Chambered Boat (ACB) offers a rugged aluminum construction vessel that has proven to be a solid, fuel-efficient performer in both rough and calm weather. ACB was established in a 30,000-sq. ft. facility in Bellingham four years ago. The origin of the



concept comes from New Zealand and Australia. Owner Larry Wieber and Bill Hickok, ACB operations manager and a production specialist, respectively spent much time devising a reasonable, systematic and standardized production process (patent-pending) for building high quality boats at a lower cost. He has settled on a method that depends on the in-house production and outside supply of airtight aluminum chambers (made from marine grade 5052 aluminum) that create the critical "lifejacket" collar for the boat. The pre-bent, pre-cut aluminum chambers are then set in place and tested individually. The ACB boat is flexible, embodied in its wide variety of applications, from recreational craft to heavy duty commercial workboat to military and patrol craft.

Hoping to penetrate the military and coastal defense markets, ACB — in August 2001, had ready for testing, a prototype vessel for the Navy.

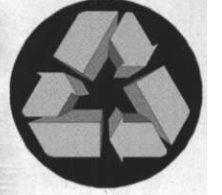
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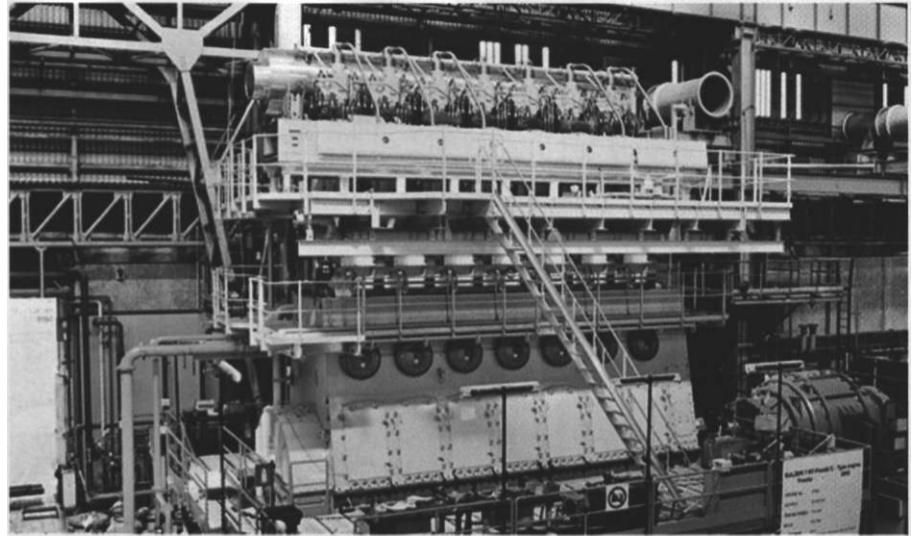
# Wartsila's Italian Plant Rolls Out Two Stroke

By David Tinsley, technical editor

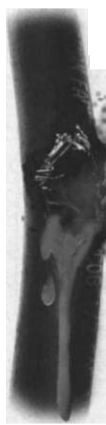
Given the rigorous commercial and physical environments in which sea commerce is conducted, shipowners are understandably conservative. The requirement for machinery and equipment reliability is all the more intense in a maritime setting, due to the far-reaching safety and shipping service implications of system dependability, while cost sensitivity permeates every aspect of product and system choice, notwithstanding technological level.

Therefore, while the development

engineers and technicians were confident from the outset that full electronic control in application to large, two-stroke marine diesel engines would yield multiple operating benefits, early hesitance in the uptake of a new generation of camshaftless engines has been entirely characteristic of a prudent, client industry. However, this year's translation of gathering interest into a clutch of orders for electronic low-speed diesel prime movers, suggests that the commercial shipping sector will in time display an equally characteristic trait: a propensity for rapid endorsement of



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technological advance once plant is at sea, delivering the anticipated benefits.

Leading executives in the marine engineering sector, immersed in the needs and views of fleet operators, believe that the nomination of electronically-controlled, two-stroke propulsion engines for newbuild tonnage will become the norm in perhaps just five years' time. Indeed, some expect the technology to

take off in the same way that fuel injection did in the automotive industry a number of years ago.

Now fully integrated within the Wartsila manufacturing network, the former Grandi Motori Trieste works in north-eastern Italy has reached a new milestone by rolling-out its first Sulzer RT-flex common-rail engine, only the second to be produced worldwide. The

imminent supply of the 7RT-flex60C unit to a combined reefer and container carrier under construction in Portugal underscores what many see as the beginnings of a shift in marine engine selection, in favor of more versatile, electronically-controlled plant. Two such engines of 22,470-bhp (16,520-kW) will be supplied by Wartsila Italia to shipbuilding contractor Estaleiros Navais de

Viana do Castelo.

The breakthrough for RT-flex technology was the nomination of a 6RT-flex58T-B engine for the 47,000-dwt self-unloader Gypsum Centennial, which was commissioned into North American east coast trade towards the end of 2001. The relatively short gap between the operating debut of the Hyundai Heavy Industries-produced RT-



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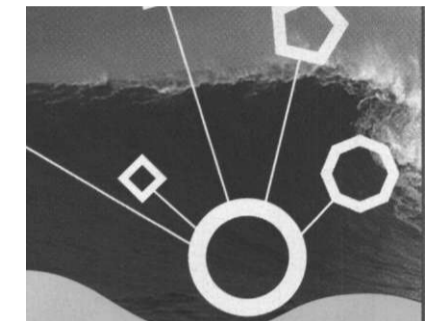
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## Propulsion Update

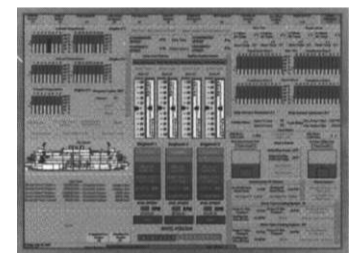


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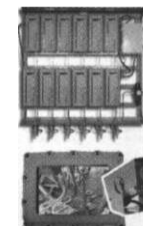
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## Propulsion Update

flex58T-B engine and the manufacturer of the 7RT-flex60C in Trieste was nonetheless sufficient to permit early service experience to be reflected in the latest machine.

Although wholly distinct in terms of trade and business interests, the respective ship operators who have made the earliest commitments to RT-flex technology display certain parallels in disposition and management philosophy. Both USG Corporation-owned Gypsum Transportation, which deploys the

Hyundai Mipo-built Gypsum Centennial, and Israeli fruit exporter Agrexco, which will charter two newbuild reefer/container carriers from Munchmeyer Petersen of Hamburg, attach high importance to environmental properties for the long-term, while seeking optimum operating qualities from assets which form the vital link in bringing their materials and produce to key markets.

Endorsement of the RT-flex system through such contracts not only under-

scores the technology's commercial relevance, but also provides a reference basis, which will help nurture business from other quarters. In the case of the Sulzer RT-flex series, Wartsila's challenger to MAN B&W's ME range of two-stroke diesels, sales have now been confirmed for eight of the engines. Besides the Gypsum Centennial installation, plus two examples of the 7RT-flex60C type for two reefer/container carriers to serve Agrexco's Mediterranean trade, four 7RT-flex60C units

have been selected for Chipolbrok multipurpose cargo vessel newbuilds at Shanghai Shipyard, while a 6RT-flex58T-B is to be fitted in a Scinicariello Aframax tanker entrusted to Sumitomo Heavy Industries.

While the engine for the Scinicariello tanker will be manufactured by Japanese licensee Diesel United, the batch of prime movers for the Chipolbrok series will come from Hyundai's engine works at Ulsan. The South Korean producer's early prominence in RT-flex manufac-

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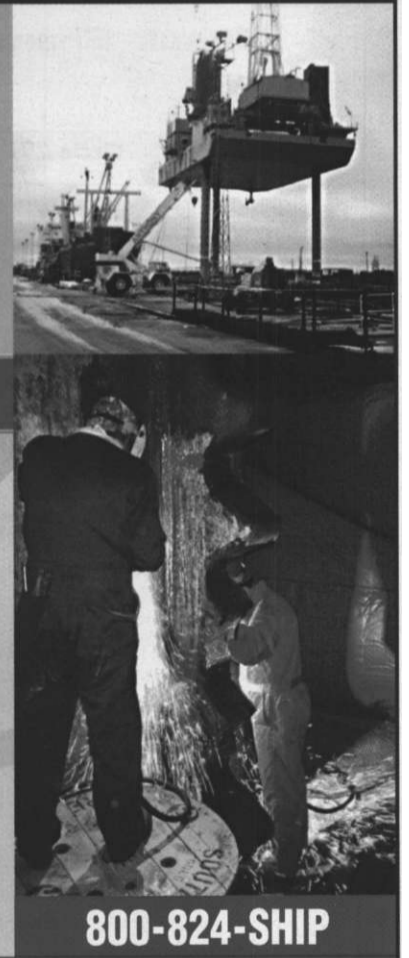
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## Propulsion Update

Main Particulars — Sulzer RT-flex60C engine

Cylinder bore	600 mm
Stroke	2,250 mm
Maximum power output	3,210-bhp/cyl. (2,360-kW/cyl)
Cylinders	5,6,7,8
Power range	11,200-25,680 bhp (8,250-18,880 kW)
Speed range	91-114rpm
Max brake mean effective pressure (BMEP)	19.5 bar
Mean piston speed	8.55 m/s
Maximum cylinder pressure	155 bar
Specific fuel consumption, at full load	125 g/bhp-h (170 g/kW-h)
Specific fuel consumption, 85-percent load	123 g/bhp-h (167 g/kW-h)

ture is indicative of its bid to complement its massive volume output capability with a growing involvement in technological design advances. In the meantime, the pair of 7RT-flex60C units built at Trieste has added a new dimension to the range of two- and four-stroke machinery from a plant that has made considerable strides in productivity and sales since becoming part of the Wartsila network.



Wartsila Italia's president and CEO Jukka Ylanen said that total output had grown from 274 MW in 1997 to an expected level of around 640 MW for 2002, and that sales had risen

from \$144.3 million to a forecast of about \$253.3 million, against a reduction in employment from 1,634 to 1,149 over the same period. The Wartsila interest in GMT had dated from the formation of Wartsila NSD Corporation in 1997, which had given the Finnish company a 40-percent holding in the Italian maker.

As the first design in the Sulzer two-stroke range to have been conceived from the outset as an electronic prime mover, the RT-flex60C type dispenses with the usual camshaft and attendant gear drive, fuel injection pumps, exhaust valve actuator pumps and reversing servomotors. Instead, it is equipped with a common-rail system for fuel injection and exhaust valve actuation, applying full electronic control to those functions. Significantly from an economic standpoint, the common-rail solution permits operation with the same grades of heavy fuel oil as are already standard for ingestion by Sulzer RTA-series engines.

The common-rail concept is Wartsila's answer to the challenges set by growing environmental restrictions on engine emissions, and has the parallel virtue of superior combustion performance, bearing upon operating setting flexibility and fuel consumption over the full voy-

age pattern and engine load range.

The key feature of the RT-flex system is that it gives complete freedom in the timing and operation of fuel injection and exhaust valve actuation. Engine settings can be matched to varied operating needs, such as slow steaming, or to specific or local air pollution requirements, with the prospect of an overall reduction in fuel oil consumption as well as pollutant release. This flexibility has been

employed to provide smokeless operation at all ship speeds, down to just 10-12 percent of nominal speed. Slow running capability and behavior has therefore been greatly improved compared with the standard two-stroke antecedents.

The precise volumetric control conferred through the RT-flex arrangements is claimed to reduce maintenance costs by extending times between overhauls.

Engine availability is increased by both the integrated monitoring functions and by the redundancy in the system's pumps, piping and electronics.

In addition to its electronic attributes, the RT-flex60C, the latest addition to the Sulzer two-stroke range employs TriboPack technology, focused on piston-running behavior.

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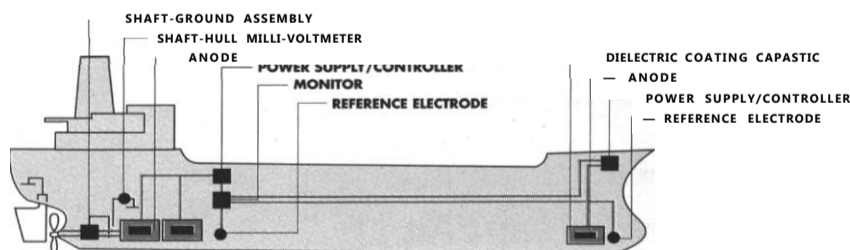
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## Propulsion Update

# MAN B&W Touts Proven Tech in New 48/60B Engine

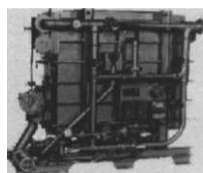
With the new version of its 48/60B medium-speed engine series, MAN B&W Diesel is attempting to prove that a cautious but successful modernization of proven technology is possible. The development of this new engine is based on the 48/60 series, of which 255 engines have been sold. The engine manufacturer, in announcing the new engine, not those nearly all-important

features have been upgraded, while its hallmark sturdiness remains.

Since their launch in 1989, the operating requirements for these engines have changed considerably: environmental standards have become stricter, fuel consumption has gained more importance as an economic factor and the demands on engine reliability have increased. These requirements have led

to the further development of the 48/60 series and its adaptation to these new standards.

Considerable effort has gone into the optimization of the gas exchange process, which is the main requirement for optimum combustion, and the combustion chamber in which this process takes place. The basic values, which designate the type, have been kept: 480



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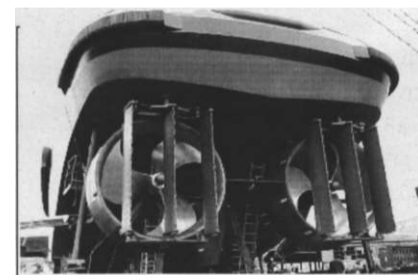
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mm bore, 600 mm stroke. Apart from these values, the new 48/60B engine also offers a variety of detailed improvements that result in less pollution and reduced fuel consumption. The shape of the combustion chamber has been optimized and the compression ratio increased from 14.4 to 15.3. Its balanced design makes the 48/60B a real IS engine (IS = invisible smoke). All other modifications were carried out with

regard to an optimum compromise between the various requirements. An increased injection intensity was designed to help reduce the visible flue gas emissions, particularly in the part-load range, but also resulted in higher NOx emissions, which are, however, neutralized by a slightly delayed injection.

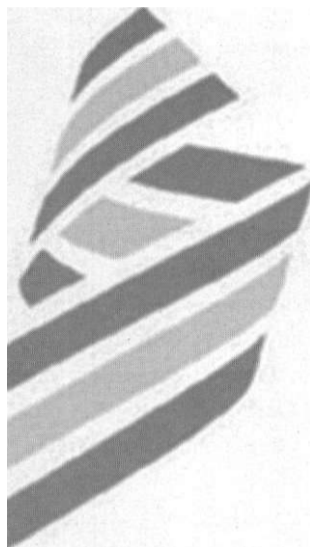
Most measures aimed at protecting the environment, ironically, entail increased

fuel consumption. In order to permit an introduction of these environmental measures without worsening the engine's operating values, the new MAN B&W TCA77 turbocharger became an integral constituent of the new concept. Through an increased flow rate and an efficiency increase of between eight and 10 percent, the turbocharger not only compensates the disadvantages, but also ensures a reduction in the amount of fuel

consumed by the new engines as compared to the predecessor series.

The minimum fuel consumption is 173 g/kWh, which is 7 g/kWh less than that of the 48/60 series. The emission values of the IMO NOx test cycle is 12 g/kWh — which equates to a reduction of eight percent compared to the predecessor.

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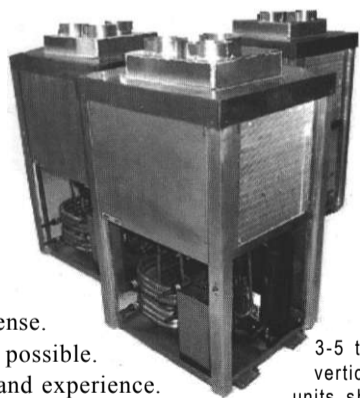
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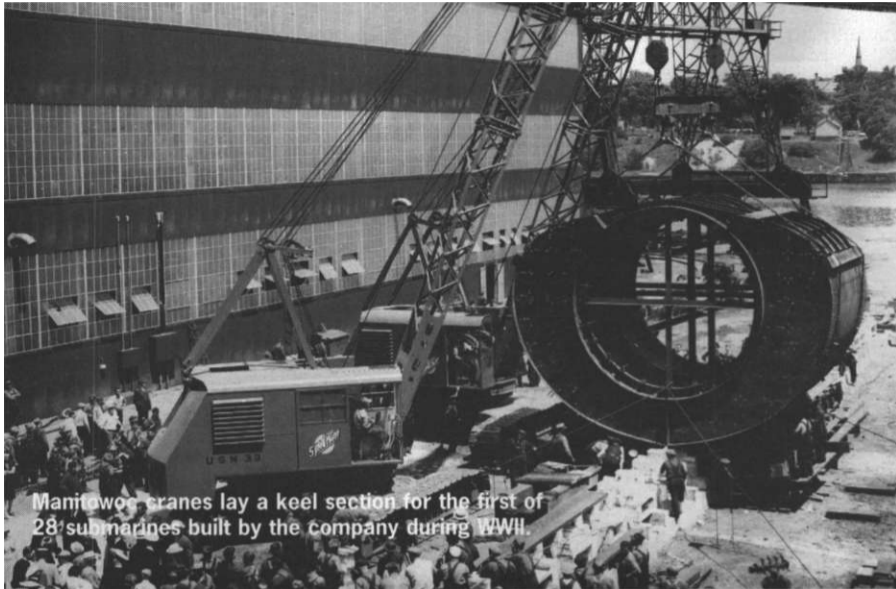
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# Manitowoc = 100 Years of Distinction



Manitowoc cranes lay a keel section for the first of 28 submarines built by the company during WWII.

The Manitowoc Company first established itself in 1902 as a shipbuilding organization, has guided itself through the past 100 years as one of the most formidable companies within the U.S. The Manitowoc, Wis.-based company has forged an enviable track record, not only based on the results of its marine group, but also from its two other primary business areas, cranes and foodservice.

This track record was proven with the recent release of the company's 2Q 2002 results. Overall, Manitowoc has performed quite well financially - posting an enviable net sales increase of 23 percent during the first six months of 2002. With a cumulative net sales of approximately \$346 million for the quarter, the marine segment, with net sales of \$52.1 million, represents a relatively small (15%) portion of the whole, versus the contributions from the crane group (\$160.1 million/46%) and the foodservice group (\$134.1 million/39%). However, net sales in the marine segment did increase seven percent, while operating earnings increased two percent: impressive results when it is considered many colleagues are in the red. And as is the case with most any company with a maritime element, this segment provides some of the most interesting history. For example, Marinette Marine holds the distinction as the only inland shipyard to have ever constructed submarines for military service, and the company recently delivered the 9,280-hp Ocean Reliance, featured on this month's cover and on page 36.

Consisting of Bay Shipbuilding Co.; Cleveland Shiprepair Co.; Marinette Marine (acquired by Manitowoc in 2000), and Toledo Shiprepair Co, the

company's shipbuilding division reported cumulative net sales of \$181.7 million in 2001 - a jump of more than \$100 million from the division's previous net of \$71.9 million in 2000. And it looks as though, in addition to its 100th anniversary, Manitowoc Company will have reason to celebrate even further, since its shipbuilding division has a bright future ahead.

"As recently announced, the U.S. Coast Guard did not award its Deepwater project to our consortium," said Terry D. Growcock, president and CEO, in the release of the company's recent financial results. "However, the Coast Guard remains one of our best customers, and we are actively pursuing a host of shipbuilding opportunities that include homeland defense and security initiatives, the shipping industry's compliance with OPA '90 legislation, and an active dredging market."

In August Manitowoc's Marinette Marine subsidiary launched its latest in a long series of USCG cutters. Known as FIR, the 225-ft. Coast Guard Cutter is the 13th member of a 16-ship series of seagoing buoy tenders, which were awarded to Marinette in 1993 and 1998. In fact, Marinette reports a backlog of new ship construction projects through 2005 - consisting of double hull tank barges, a Great Lakes icebreaker, two additional USCG buoy tenders and three Staten Island ferries.

While Manitowoc marine segment as a whole has endured continuous weakness in its ship repair business, the company can fall back on its claim as the largest ship repair organization on the Great Lakes. In fact, Manitowoc operates more than 60 percent of the U.S.

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In its 100-year history, Manitowoc has only had six presidents. Shown (l to r) are: **Elias Gunnell, Charles West, John West, Ralph Helm, Fred Butler and Terry Growcock.**

Great Lakes' dry dock footage - including two of the three largest graving docks.

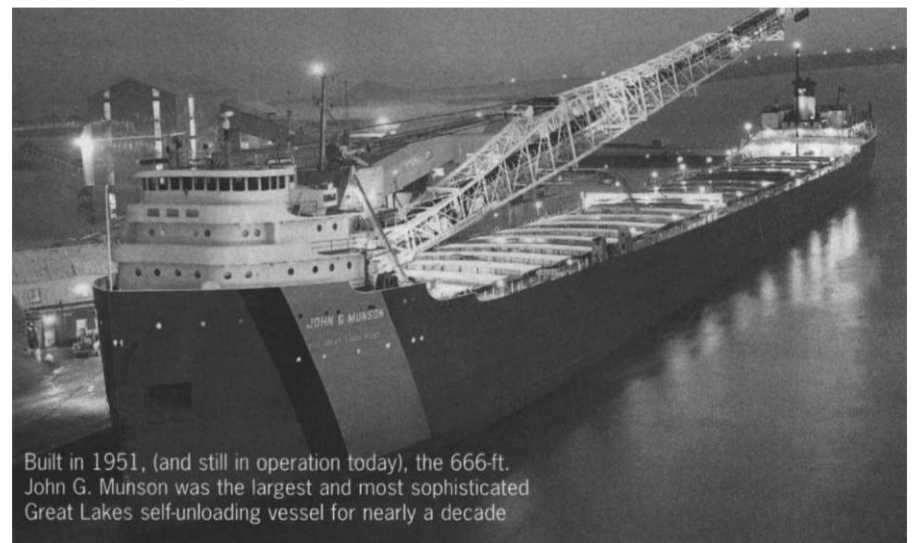
## A Century of Success

Manitowoc's 100-year-old roots as a marine company — as the Manitowoc Dry Dock Co. — virtually ensure its commitment to keep its shipbuilding division on top. On June 27, 1902, this company was established by Elias Gunnell, Charles West and Lynford Geer. Just three years later, the company delivered its first steel-hulled vessel, the passenger steamer Maywood, which was delivered to Escanaba & Gladstone Transportation Co.

Following the delivery of passenger cargo steamship Alabama in 1910 - the company changed its name from Manitowoc Dry Dock Co. to Manitowoc Shipbuilding Co. The name change reflected what would occur at the corn-

shipbuilding for the next several years. To alleviate a drastic cut in its workforce, Charles West sought out new business endeavors, eventually building (with Lynford Geer), a cement plant in Wisconsin called Portland Cement Co. West also invested up \$410,000 of his own money to buy the yard from stockholders in 1920, when it was put up for auction. While Geer and West went on to develop ways to expand Manitowoc's abilities, Elias Gunnell was adamant about selling the yard. Among a majority of stockholders who felt this way, he decided not to follow his co-founders with their purchase, deciding that after 40 years in the shipbuilding business, he had other outlet to pursue. Even so, Gunnell did remain active in the marine business until his passing in 1926.

Among the other "outlets" that Manitowoc delved into was the speedcrane business. The company began in 1925,



Built in 1951, (and still in operation today), the 666-ft. John G. Munson was the largest and most sophisticated Great Lakes self-unloading vessel for nearly a decade.

pany for the next several years, for it came to be known as the premier builder of oceangoing freighters during WWI. With approximately 2,500 workers pumping out 33 of these vessels from 1916-1919, the 3,500-ton ships (the maximum that could move through the St. Lawrence Seaway locks) were used to replace ships sunk in the Atlantic by German U-boats.

The end of the war effectively halted

building Moore Speedcranes for Roy and Charles Moore. Eventually establishing themselves as Manitowoc Speedcrane, the company's Model 1500 speedcranes were responsible for constructing government office buildings in Washington, D.C. The 1930's also revived shipbuilding for Manitowoc - the company constructed a trio of patrol

(Continued on page 88)



## TankRadar System Breaks New Ground

SaabRosemount is offering to vessel owners what it dubs an innovative 3-in-1 solution for Level Gauging, High Level and Overfill alarm in a single tank gauge unit. The Saab TankRadar STaR system has enjoyed good success since its introduction to market in May 2002,



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The Saab TankRadar STaR fully utilizes new sensor technology, as ready-processed signals from the intelligent radar tank unit are transmitted. The unit provides frequent gauging intervals, allowing operators to act fast in response to level changes, making the loading and discharging of products more predictable and safe.

The system includes temperature measurement with up to five different sensors. A digital, high-accuracy pressure sensor can be built into the tank gauge unit. An additional safety feature is the back-up battery, which ensures uninterrupted power supply to the system.

The new unit is virtually maintenance free, and can be serviced during operation, under closed loading conditions, for maximum safety and convenience.

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## North American Marine Jet Expands Its Market

Since the introduction of its Traktor Jet 1-150 in 1987, North American Marine Jet, Inc (NAMJ) has (due to the tremendous acceptance of this revolutionary new high thrust, slow speed marine jet package), expanded into new market areas with the larger Traktor Jet HT Series.

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The Traktor Jet HT Series units are ideally suited for any application requiring high thrust at slow speed, such as

work boats, motor yachts, excursion boats, oil recovery/boom boats, fishing seine skiffs, and tenders.

These true axial flow units feature low shaft speeds (300-1050 RPM) providing efficient and dependable service when driven by diesel engines of up to 1,200 hp.

Based on the successful Traktor Jet series, NAMJ created the innovative the Traktor Jet HH series, which provides the high thrust capability of the HT series combined with increased dynamic thrust, to produce efficient performance up to 30 knots.

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## Manitowoc... 100 Years

(Continued from page 47)

water and the water separates from the rake, so the skegs do not have enough flow over them to create the lift required to stabilize the barge. This is similar to the explanation he has for why not all barge designs are suitable for Hydralift skegs. He states that if the aft rake is too steep, the same water separation problems will occur in deep water.

The lack of directional stability at slow speeds was a problem with the first generation of skegs resulting from how they were configured to come back on course after encountering a disturbance. Gruzling states that originally, they were given the same directional damping as ordinary skegs.

The second generation of Hydralifts have much more damping and the complaints he sometimes hears now are that the skegs are too effective and the barges can be difficult to turn.

Fowlis also states that they also do not stand up to grounding very well, especially in mud where they "act like mushroom anchors."

Fowlis also points out that if damage results from this, the debris collecting tendency, or from the tugs hitting them during tie-ups, it "is more of a process to repair". Because they have a curved foil section, rather than the flat surfaces of ordinary skegs, they take more work to repair.

In the past six years, Gunderson Marine in Portland, Oregon has built at least 10 barges with Hydralift skegs. According to Chuck Garman, Marine marketing and sales manager at Gunderson, the Hydralift skegs are three to four times the cost of regular skegs. But he stresses that they don't increase the overall cost of the barge very much at all, typically an extra one-half to one percent of the total cost of the barge.

Based on their current use, and the limitations found so far, Hydralift skegs seem best suited for long distance barge towing. For something as mundane as barges, the energy savings predicted in scale experiments are substantial and seem to have corresponding results in the real world. For companies doing long distance towing where a deadline or speed is of importance, or those companies where the fuel savings would more than offset any costs that might result from the skeg's limitations, Hydralift skegs are a concept that warrants further investigation.

(Continued from page 86)

ships for the U.S. Coast Guard - one of which earned the designation as President Franklin Roosevelt's yacht, Potomac. The news of a Second World War also added to the company's shipbuilding binge. In 1940, Manitowoc signed a contract with the U.S. Navy to construct 10 submarines - most significantly the USS Peto. Launched in 1942, this vessel was known as the first U.S. Navy submarine to be constructed on the Great Lakes, and the first to be side-launched. By the time the war ended in 1945, the yard would construct 18 additional submarines, as well as a variety of other military vessels.

Also, In 1945, Manitowoc began manufacturing domestic freezers and other commercial refrigeration equipment, signaling the beginning of what would become a profitable entity for the company years later when its foodservices division was established.

### Halfway There

Upon reaching the half-century mark in 1952, Manitowoc reorganized its efforts, changing its name from Manitowoc Shipbuilding to Manitowoc Company. While the company's shipbuilding division was still pulling in business (it had just launched John G Munson, the largest self-unloading vessel on the Great Lakes one year earlier), the company wanted its name to reflect its changing image. Management also changed, when in 1957, upon the death of Charles West, one of the company's original founders, a new company president was elected - John D. West, who none other than the son of one of Manitowoc's founding fathers.

In 1961, Manitowoc built its last large vessel, the 730-ft. Edward L. Ryerson at its Manitowoc, Wis. location. While there was a growing need for larger, higher capacity vessels, the Great Lakes shipbuilder saw, because of rising labor and material costs, owners were beginning to divert to Canadian

and European yards, who could offer more competitive prices. With virtually no vessels at the yard since the Ryerson, Manitowoc began to seek a new location that would enable it to maintain its role as a premier Great Lakes shipbuilder. Therefore from 1968-1970, the company purchased real estate and fixed assets of Sturgeon Bay Shipbuilding and Dry Dock, as well as the real estate of Christy Corp., thus forming Bay Shipbuilding Corp. in Sturgeon Bay, Wis. This proved to be a step in the right direction, as the company not only revitalized Great Lakes shipbuilding with the construction of self-unloading freighter Charles E. Wilson, but also stock listed on the NASDAQ that year, trading publicly for the first time.

### The 1980's and Beyond

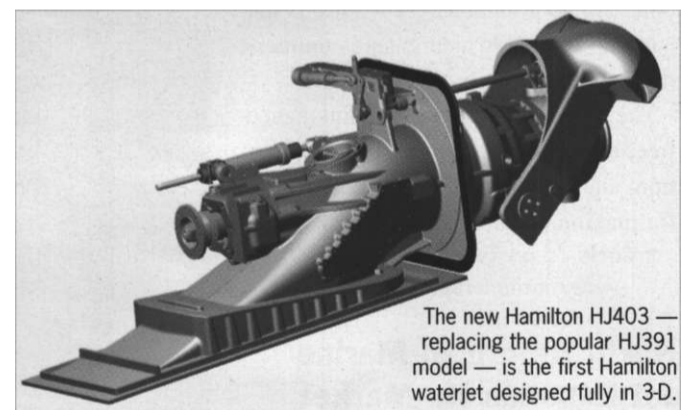
With the election of President Ronald Reagan, the 1980's not only brought about economic change, they also brought about big business for shipbuilding. In fact, Manitowoc's then president and CEO, Ralph Helm was honored by Reagan in 1983 at a Commerce Department event honoring U.S. companies for their efforts expanding trade overseas.

Already listed on the NASDAQ, Manitowoc Company enhanced its image with a stock listing on the esteemed New York Stock Exchange (NYSE) in 1993. Three years later, in 1996, Bay Shipbuilding continued to thrive with the completion of Integrity - a 460-ft. integrated tug/barge - the first new vessel to built for dedicated service in more than 10 years. Manitowoc Marine continued to look for additional opportunities, and in November 2000, purchased Marinette Marine Corp. in Marinette, Wis. in order to expand its construction work for military and research customers. Utilizing its already established shipyards (Bay Shipbuilding, Toledo Shiprepair and Cleveland Shiprepair), for repair, maintenance and construction of commercial vessels), Manitowoc brought Marinette into the mix to rise up as the largest and all-encompassing American shipbuilding and ship repair group in the Great Lakes.

## HJ403: Hamilton Unveils New Water jet

Hamilton Jet has released a new waterjet model, the 400 mm HJ403 - replacing the popular HJ391 model. According to the manufacturer, the new unit will offer many benefits over other propulsion systems for high speed work and patrol boats with power inputs up to 900 kW. As with all Hamilton waterjets, the HJ403 is designed to provide excellent high speed and cruising performance and superior cavitation resistance at low speeds and when under loaded conditions. The wide range of impeller options available ensure its compatibility with a variety of engine models, either direct driven or via a gearbox, and the flexibility of the jet unit makes it suitable for many different types of vessel in single or multiple installations.

While the basic specifications of the HJ403 are similar to its predecessor, the new model includes several new design features to improve the installation and operation of the jet. It is available in either zero or five degree shaft angle options to suit different engine alignments and vessel trim, and the jet features a more compact balanced reverse duct with the same superior zero-speed and reverse maneuvering performance and lower actuating loads. The latter allows the unit to utilize a single reverse cylinder with faster response times. The HJ403 is more compact than the previous model, with the intake block positioned further aft against the transom, reduced length between coupling flange and transom, and reduced height from base to fully raised reverse duct. This



The new Hamilton HJ403 — replacing the popular HJ391 model — is the first Hamilton waterjet designed fully in 3-D.

unit is also lighter than the HJ391. The jet incorporates Hamilton's JT steering system, which minimizes thrust loss when steering. The HJ403 is the first new model to feature stainless steel leading edge inserts in the stator to reduce wear when operated in abrasive conditions. The HJ403 may be configured for manual hydraulic or power assisted steering, while the standard reverse function uses Hamilton's new HFRC Reverse Control System. This servo hydraulic system "decouples" the reverse control levers from the reverse duct movement while providing full follow up control. It also allows quadruple jets to be controlled in pairs using only two reverse controllers.

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RAI GROUP  
INTERNATIONAL COMMUNICATIONS

## Cover Story

(Continued from page 37)

The bow of the tug is fitted with a WYW-20-48 hydraulic combination winch/windlass with a 1.25-in. anchor wildcat, and soft-line storage drum. Adjacent to the main hawser winch is a type DEPC-42 electric deck-winch for 350 ft. of soft-line, used for tie-up and

basic barge-work (thus protecting the main line from general-purpose wear and tear) The DESS-52 250 HP Electric Hawser Winch provides the Captain with the ability to devote his attention to utilizing all of the tug's potential, and leaving the Hawser Winch to handle the line. The winch capabilities include:

- Constant-tension winch line pulls to

three times the Tug Bollard (440,000 lbs. maximum) (similar to DNV type "Escort Winch" requirement)

- Automatic inhaul and payout up to line speeds of 700 fpm
- Water-cooled "slip" brakes, capable of continuously dissipating up to 1,600 hp, or the bollard pull of the tug at 3 knots.

- Render - Recovery to 3 times the bollard pull - i.e. active winch during escort/arrest evolution
- Automatic or Manual (Selectable at Wheelhouse console) three-speed gear transmission
- Dual, all electric AC drive, (75 hp, 175 hp (combine to 250 hp)
- Tension monitoring system during braking and inhaul-payout operation, i.e. real-time display of line-tension at all times
- User controlled electric-motor driven level-wind; ability to override the level-wind at the Wheelhouse console
- "Seamless" transfer from the Render -Recover mode to the "Render only" mode using the water-cooled brakes
- "Drop in", fully integrated winch design (excluding the electric power unit (EPU) which is mounted on shock mounts in the space below the winch).

For additional information on Markey Machinery:

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(Continued from page 36)

Manager of Bay Shipbuilding Co. "From the shipbuilder's perspective, we are sending our creations off into the world of commerce."

"Building the Ocean Reliance tug/barge was an excellent opportunity for two long-standing companies who are deeply committed to the maritime industry to work together on a high-profile project," said **Terry D. Growcock**, President and CEO of The Manitowoc Company, Inc. "It also afforded us the opportunity to showcase our multi-yard shipbuilding expertise by building the barge in Sturgeon Bay and the tug in Marinette. Being able to leverage the strengths of our workforce and facilities has resulted in an innovative vessel that will complement the reputation and heritage of the Crowley fleet for many years to come." An ATB has an articulated, or hinged, connection system between the tug and barge, which allows movement in one axis, or plane in the critical area of fore and aft pitch.

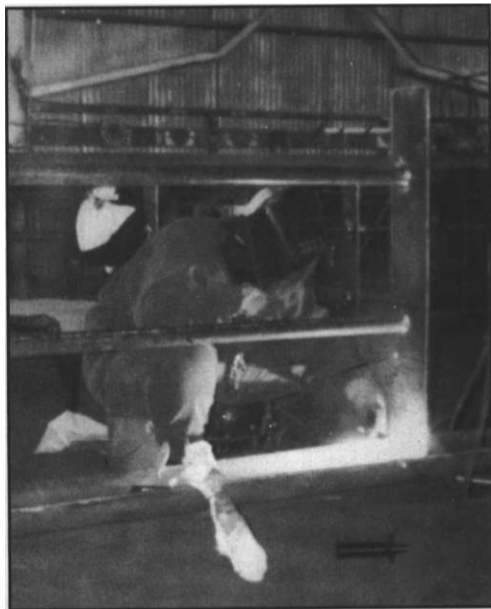
Seattle's Markey Machinery supplied, on the barge four (4) DYSMD-22 Double-Drum Mooring Winches and one (1) DYSMW-22-37 Combination Mooring Winch/Anchor Windlass. On the tug is one (1) CEW-90 Electric Stern Towing Capstan and one (1) CEW-60 Electric Bow Capstan. Winches are powered by MHPU-600-D-PC Hydraulic and Control System.

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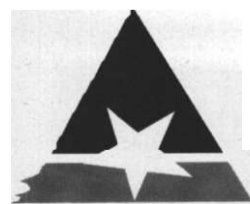
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## Coatings & Corrosion Control Products

### SpongeJet

Sponge-Jet has released its new, patented High Production (HP) series of equipment. The technology's ability to accelerate surface preparation and painting operations, while allowing surrounding trades to work uninterrupted. Sponge-Jet Feed Units expand on the technology of conventional abrasive blasting by including a variety of specially design components, which include an agitation assembly, a pneumatic, auger-based abrasive delivery system and a comprehensive operator control panel.



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### Enviroline

Industrial Environmental Coatings Corporation's Enviroline Series of thick-film linings act as an effective corrosion barrier for companies. Enviroline coating and lining systems have been tested utilizing recognized industry standards for corrosion and mechanical properties. The Enviroline Series products are formulated for continuous immersion in a variety of harsh environments.



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### Propeller

International's August edition of Propeller, features an in-depth timeline of antifouling. *Antifouling: Through the Ages*, preface's IMO's January 2003 global treaty on the 'Control of Harmful Antifouling Systems on Ships' which intends to



ban the application of TBT antifoulings. The brochure also features the section, Abrasion Resistance, which describes protection of cargo holds. Propeller also includes a new-building section and exhibition coverage.

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### Sherwin Williams

Armor-Seal Heavy Duty Floor Coatings, a new brochure from Sherwin-Williams Industrial and Marine Coatings group, describes advanced waterborne and high-solids floor coatings for demanding service conditions. The eight-page brochure provides specification and application information on Armor-Seal Heavy-Duty Floor Coatings products in a table format. It also includes the full range of Armor-Seal Heavy-Duty Floor Coatings, from acrylic water-based, water-based epoxy to moisture cure urethane, self-leveling epoxy, heavy-duty non-skid and heavy duty floor resurfacer.



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### Blastrac

A new brochure from Blastrac discusses the advantages of shot blasting and details the company's line of portable shot blast cleaning machines. Shot blasting is the recommended method of surface preparation by most

®»J

coating manufacturers and is used to remove paint, coatings, grease, dirt, laitance, rust, mill scale and other contaminants. Shot blasting is used on concrete, steel, brick, stone and asphalt surfaces.

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### International Paint

For more than 100 years, International has provided solutions to the global Marine industry's constantly evolving needs and earned a reputation of trust and quality. Technology leaders in TBT free antifoulings, abrasion resistant coatings, ballast tank coatings and fouling control systems, International marine coatings are engineered to deliver proven performance in service while representing value for money.



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### Urecoats

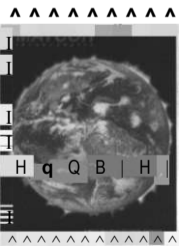
UrecoatsRSM series products are made from a patented Rubber Sealant Membrane (RSM) formula that is comprised of crumb rubber from recycled tires, polyurethane, asphalt and other proprietary chemical agents. The UrecoatsRSM formula and application process has been formulated and perfected from millions of dollars in research and development by professionals, chemists and engineers over a period of four years. The products are weatherproofing and offer greater elasticity and longevity in part because they contain crumb rubber from recycled tires in their composition.



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### Matcor

Matcor, Inc., headquartered in Doylestown, Pa, is a cathodic protection and corrosion engineering/ manufacturing firm that operates throughout the world. Through its own offices and those of its agents, Matcor services all types of projects on a worldwide basis. Known for its ability to provide unique solutions to unusual corrosion problems, the company provides engineering and equipment manufacturing services for all types of industry and government.



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### < Chlor Test

Chlor Test was developed for ease of use and to prevent outside and cross contamination. The components are pre-measured to ensure accurate results in ppm and micrograms per sq. cm. The Chlor Test uses a unique patented extract solution, Chlor Extract, to retrieve surface chloride contamination.

### CHLOR \*TEST\*



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### Hempel

Hempel's pro-active crane system consists as standard of a zinc primer, an epoxy mastic and a polyurethane topcoat. This system provides maximum corrosion protection, good abrasion resistance, long durability, good color stability and gloss retention. Strong protective crane coatings from Hempel also provide strong return on investment, which is why Hempel coatings has become a quality feature of over 750 new container cranes during the past few years.



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### Gardner Denver

Gardner Denver Water Jetting Systems offers the TLE - Trans Line Exchanger Cleaner. This lightweight machine has been developed to clean verticle trans line exchangers in furnaces and other vertical bundles. It consists of two air motors: one to feed the hose and one to retract the hose. The body consists of two pieces: made from a special aluminum alloy, which can be separated by four small air cylinders, for quick-changing of the high pressure hoses. The hoses are moved by two continuous chains with polyurethane blocks, which are powered by the air cylinders.



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### UltraStrip

UltraStrip Systems' M2000 Control Center houses the components that control the robot on the steel surface, and vacuums the paint and water after the coating has been removed by the robot. The wastewater with paint residue and all particulates are sent to the holding tank and an optional closed loop filtration unit. The Control Center and M2000 Robot are packaged together as a unit.

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### Drew Marine

The Drew Marine Division of Ashland Specialty Chemical Company is a leading supplier of chemicals and the leading supplier of specialty marine chemicals and water treatments for the global marine industry. Drew Marine also markets a wide range of technical products and services to support efficient vessel operations and maintenance. These include: specialty cleaners and maintenance products; corrosion inhibitors; welding, refrigeration and sealing products; engineered systems; energy management products; and fire fighting, safety and rescue products.



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### HMG

Crystal Seal floor and locker lacquer from HMG Paints is ideal for timber floors and other high traffic areas, as well as lockers and interior paneling, the Crystal Seal system protects, preserves and is manufactured to enhance the natural beauty of wood, at the same time helping to prevent slipping on wet or damp surfaces. Crystal Seal is a moisture-cured, high build polyurethane coating, which combines the performance of a two-component paint, with the simplicity in use of a single pack lacquer. Used straight from the can, several coats can be applied within hours.



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### Tapecoat

Tapecoat's Marine Products, TC Enviroshield Series, is designed for the maximum protection of pilings, risers and lateral beams from the harsh marine environment. This easy field installed modular system provides abrasion and corrosion protection of existing and new marine structures. A tough outer abrasion resistant jacket activates an encapsulating environmentally safe petrolatum with the tensioning of a unique, easy installation closure system. It allows for quick reinspection and easy accommodation of lateral braces, peripheral beams and weld attached anodes.



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### NCP

NCP Coatings develops Dynamatch, a versatile tint mix system. The DynaMatch tint mix system is designed specifically to meet the demands of stringent application processes and performance specifications.

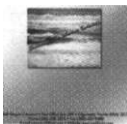
DynaMatch tint mix system simplifies custom paint purchasing, fulfillment and color formulation. Using just one set of 16 high-pigment loading tint pastes, the DynaMatch system allows for accurate color matching in a variety of bases.

**Circle No. 116**

**Edgewater**

Edgewater Machine and Fabricators, Inc. has supplied more than 2,000 winches, davits, windlasses and other deck handling equipment to the marine industry. They have a reputation for supplying throughout the world, extremely rugged, reliable and easily maintained equipment. In addition, our service division is available for assignment anywhere in the world to keep your equipment in the best possible condition and to help eliminate down time. Edgewater operates a quality assurance system with rigid adherence to the MIL-I-45208A standards.

ABBMB.



Circle No. 117

**smartALIGN**

smartALIGN has taken the task of laser shaft/coupling alignment to a new level of simplicity. It utilizes 'smart' navigation with just a joystick and two keys. On-screen help text guides the operator to the results for best corrective shimming and horizontal moves. Robust, compact design for industrial environment it also features a rechargeable battery and a high resolution back-lit display. Alignment readings in three 'smart' steps: Dimension, Measure and Result. Graphic display of machine centerlines in addition to display of foot and coupling values.



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**Leslie**

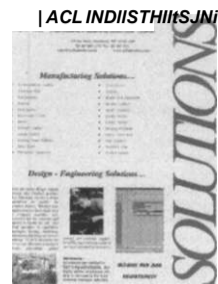
Leslie Controls' Heater Handbook is now available. The handbook contains information on Leslie's complete line of hot water heaters and accessories. Technical information on the Constantemp, LES Series and new line of steam generators is provided. Sizing information is included to determine heater sizing based on fixtures when the actual flow is not known.



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**ACL Industries**

From the initial design concept through the finished product, ACL Industries has the in-house capabilities to handle the complete project. ACL has a broad spectrum of capabilities to encompass welding, machining, engineering, finishing and process painting.



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**Incat**

Incat - The Magazine is produced six times a year by Incat Australia Pty Ltd, builders of some of the world's fastest large vehicle and passenger ferries. Recent Incat deliveries to Europe include four fast 315 ft. (96 m) catamaran ferries operating in Spain and the Royal Australian Navy's HMAS Jervis Bay which carries and troops between Darwin and East Timor.



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**Marine Software**

Marine Software Ltd. produces simple, easy to use, Planned Maintenance, Stock Control and Purchasing systems for the marine industry. They are renowned for their simplicity encompassing low training requirements. All systems being compatible with the modern day windows environment. They also offer a foil upgrade path from many existing DOS based systems.



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**Bloksma**

A box cooler is a maintenance free cooling system, which finds growing application both for inland and sea going ships. Cooling effect is reached by natural circulation of the outboard water in the sea-chest or by a circulation due to the speed of the vessel.



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**StressTel**

StressTel manufactures a complete range of ultrasonic thickness gauges, flaw detectors, transducers, and bolt stress measurement instruments for a wide range of industrial applications. The T-Mike E is an ultrasonic thickness gauge that is ergonomically designed to fit comfortably in your hand. It features an amber-colored aircraft-style display to reduce eye strain, automatic calibration with auto-probe zero, and extended battery life.

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**Miller Leaman**

Miller-Leaman, Inc. is introducing their Stainless Steel Thompson Seastrainers to the Marine Industry. Available in Type 304 and Type 316L stainless steel, the unique strainers feature a large conical screen element. As water enters the bottom of the strainer housing and flows upward, heavier debris and particulate is accelerated downward into the debris reservoir at the base of the strainer. The particulate is then flushed from the reservoir via the debris port.



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**Lang Combi**

The Lang Combi Oven features time-tested Boilerless technology that can bake, roast and steam with faster cooking times than traditional ovens. The Lang Combi is a versatile three-in-one oven that cooks with convected hot air, pressureless steam or a combination of both. The key to its performance is an advanced Instant-On Steam Generation System that eliminates the convention boiler. It comes with a spray hose and nozzle to facilitate routine cleaning, plus it has three levels of cooking control panels: manual digital or digital programmable, with features such as a self-diagnostic display.



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**Viking**

The Viking Evacuation Chute, VEC, concept incorporates dry-shod evacuation systems which enables passengers and crew to board liferafts in a quick and safe manner, without having direct contact with the water. Safety of life at sea is of prime concern to VIKING. To produce life-saving equipment to the highest possible safety standards must be the distinguished aim of any manufacturer in this field. Having learned valuable lessons through our more than 40 years of existence in the maritime business, VIKING stands for quality, reliability and safety.



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**STN**

STN ATLAS Marine Electronics offers a comprehensive range of advanced ship automation, navigation, propulsion and power management systems under the theme, Always a Step Ahead. The proprietary Ship Control Centre (SCC) integrating and automating all main bridge equipment operating functions for navigation, communications and general ship management. It incorporates a latest NACOS Series 4 navigation command system inclusive of Chartradar Atlas 1000.



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**Wheelabrator**

The Wheelabrator Technical center, located LaGrange, Ga., features a variety of machines for testing, including various Tumbler units, Monorail, Wire Mesh Belt, blast Lite, barrel Blaster, Rotary Table, flex Belt, Spinner Hanger machines and a Large Demo Machine that simulates the tasks of 13 individual blasting machines including the Parallel Roll conveyor, Skew roll, Car Table, Rocker Barrel, Pipe machine, Swing Table, Mesh Belt.

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**Jilson Group**

The Jilson Group now offers corrosion-resistant thermoplastic bearing housing. They are offered as pillow block, 2-bolt and 4-bolt styles in the 204, 205, 206, and 207 sizes, and can be equipped with either metal or plastic insert bearings. Standard size insert bearing with bore sizes ranging from .5-in. to 1.5-in., are available from stock for use in Jilson thermoplastic housings. The Jilson housings are made of high-grade, solid PBT thermoplastic polyester, and can be replaced for conventional cast iron housing in many applications.



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**MAN B&W**

MAN B&W's versatile RK280 range of engines is offered in basic packages to suit the particular operation requirements of marine propulsion, marine electrical power generation, base load and stand-by power generation and mechanical drives. According to the manufacturers the compact design, high power to weight ratio and low operating costs of the RK280 make it the ideal choice for marine applications where reliability, space and weight considerations are important.

IGS\ RK280

DR

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**ChartCo**

MetManager, an icon-driven graphical marine weather briefing system, is a member of a family of marine information products and services broadcast by ChartCo using the Inmarsat point to multi-point channel. It provides a ships' master with up to date weather information displayed using an onboard computer. It is accessed using Inmarsat A or B satellite communications terminals through a dedicated ChartCo receiver. By using current weather data to generate color-coded graphics, the software allows users to see severe weather systems.



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# BUYER'S DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. If you are interested in having your company listed in this Buyer's Directory Section, contact Mike Lowe at (212) 477-6700.

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## AIR CONDITIONING AND REFRIGERATION

Adrick Marine, 81 Mahan St. W. Babylon NY 11758  
Bailey Refrigeration, 4986-1 EudKI Road, Virginia Beach, VA 23462  
Cosposhik Refrigeration, 14695 Highway 61, Norco LA 70079  
Flagship Marine 2427 SE Dixie Highway, Stuart, FL 34996  
Port-A-Cool, P.O. Box 2108, Centex, TX 75935  
Scott Bronswork Inc., 3755 C Doul Matte Bossard, Quebec Canada J4Y2P4  
Taylor Made Environmental PO Box 15299 Richmond, VA 23227

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GJ WortelDoer Jr. B.V. PO Box 5003,3008 AA Rotterdam, Netherlands  
Washington Chain Inc., Box 3645, Seattle, WA 98124

## AUTOMATED SELF UNLOADING

Seabulk Systems Inc., Suite 100,3751 Shell Road, Richmond, British Columbia, CANADA V6X2W2

## AUTOPILOT SYSTEMS

Beier Radio1990 Industrial Ave Harvey, LA 70056  
ComNav Marine Ltd., <15.13511 Crestwood Place, Richmond,BC V6V 2G1  
Mackay Communications 2721 Discovery Dr., Raleigh, N.C. 27616-1851

## BALLAST

Ballast Technologies ,4620 S. Coach Dr., 85714, Tucson, AZ  
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## BARGE RENTALS

Cashman Equipment, Three Dolphin Way, Boston, MA 02210

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Sohre Turbomachinely 132 GilbertMe rd PO Box 889 Ware, Mass 01082  
Thornd Bearings Inc., 3225 Malvern Way, Burlington, Ont, CANADA L7M1A6  
Vesco Plastics, P.O. B. 40647, Cleveland 2022 SOUTH AFRICA

## BILGE SYSTEMS

Fast Systems 14040 Santa Fe Trail Dr. Lenexa, Kansas 66215.1284

## BLOCKS & RIGGING

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

## BOILERS (HEAT RECOVERY)

Deiak LLC 2905 Northwest Blvd Ste 150 Plymouth MM 55441 USA

## BOATBUILDER

Allen Marine PO Box 1049 Sitka, AK 99635  
Hike Metal, On Box 698, Wheatley, ON Canada N0P 2P0  
Kivchak Marine, 469 NW Bowdoin Pl., Seattle WA 98107  
Sea Ark Marine PO Box 210 MonticeloAR 71655-0210  
Washburn Doughty, P.O. Box 296, E.MoBham ME 04544

## BRIDGE SUNSCREENS

Maritime International, 100 E. Vermilion Street <212, Lafayette, LA 70501

## BRIDGE SUNSCREENS

Markel Marine Blinds, Unit 46, Century Business Centre, Maversway, Rotheltham, South Yorkshire, S63 5DA

## BROKERS

Marcon International, Inc., P.O. Box 1170, Coupeville, WA 8239-1170  
Mowbray's Tug 1 Barge Sales Corp., 35 De Hart St, Morristown NJ 07960

## BRUSHES

Sohre Turbomachinely Inc 132 Gilbertville Rd PO Box 889 Ware, MA 01082-0889

## BULKHEAD SEALS/PANELS

CSD North America, 680 Candia Rd., Unit 10, Manchester, NH 03109  
Thermax., 15006 Shaw Rd., Tampa, FL 33625-4500  
Thermax 3115 Range Rd Temple, TX 76501

## BUOYS

Datrex, P.O. Box 1150, Kinder, LA 70548  
Urethane Products 9076 Rosecrans Ave Beklowler, CA 90706

## BUTTERFLY VALVES

Norrisal PO Box 40525 Houston, TX 77240

## CABLE TRANSIT SYSTEMS

CSD North America, 680 Candia Rd., Unit 10, Manchester, NH 03109

## CALIBRATIONS

Standard Calibrations Inc., 906 A Ventures Way, Chesapeake VA 23320

## CAD/CAM SYSTEMS

Albacore Research, 4196 Kashtan Place, Victoria, B.C. Canada V8X4L7  
Autoship Systems Corp., #403.611 Alexander St. Vancouver, BC, Canada V6A1E  
Creative Systems, Inc., P.O. B. 1910, Port Towisend,WA 98366  
Kockums Computer Systems AB, PO Box 505555, S-202 15 Malmö SWEDEN  
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA92029  
Ship Motion Associates, 10 Danforth St., Portland, ME 04101-4567

## CAPSTANS

G.J. Wortelboer Jr. BV, P.O.B. 5003,3008 AA Rotterdam, Netherlands  
Superior Lidgerwood Mundy, 1101 John Ave., Superior, WI 54880

## CARGO MONITORING A CONTROL SYSTEM

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

## CAST IRON REPAIR

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

## CHAINS

Crandall Drydock Engineers PO Box 505804 Chelsea, MA 02150  
Washington Chain, P.O. Box 3645, Seattle, WA 98124

## CHEMICALS

Unisetvice Americas 57174 Hardin Rd., SMail, LA 70461

## CLASSIFICATION SOCIETY

Lloyds Register 71 Fenchurch St London EC3M 4BS

## CNC PLATE CUTTING

Advanced Fabricating Inc PO Box 3721 Galveston, TX 77552

## COATINGS / CORROSION CONTROL / PAINT

Anker Marine Paints, 21 Charles Street, Westport, CT 06880  
Chesapeake Specialties Products, 5055 North Points Blvd, Baltimore Md 21219  
Chugoku Marine Paints PO Box 73 47932H Finaart The Netherlands  
DeFelsko Corporation, 802 Proctor Avenue, P.O.Box 676, Ogdensburg,NY 13669  
ESgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502  
Ferro Corp., 1301 North Flora St., Plymouth, IN 46563  
Flow International corp., 23500 64th Ave. south Kent WA 96032  
International Paint Inc., General Offices, 6001 Antoine Drive, Houston, TX 77091  
Jamestown Distrib, P.O. Box 348, Jamestown, RI 02835  
Joton Paints Inc, 1401 Severn St., Baltimore MD 21230  
Mascoat Products, 10890 Alcott Unit 102 Houston, TX 77084  
Nace Inn, 1440 South Creek Dr., Houston, TX 77084  
Reslo Motive Laboratories PO Box 1336 Morristown, NJ 07962-1235  
Sherwin Williams, 101 Prospect Avenue, Cleveland OH 44115  
Sigma USA, PO Box 816, Harvey, LA 70059  
Wasser High Tech Coatings, 8041 South 228th St, Kent WA 98032

## COMMUNICATIONS SERVICE

Comsat Maritime Services, 6560 Rock Spring Drive, Betfesda, MD 20817-1146  
Marital Marine Communications, 16 E. 41st St., NY, NY 10017  
Maritime Telecommunications Networks, Inc., 3044 N Commerce Pkwy Miramar FL 33025

## COMPOSITE PILINGS

Hardcore Composites 618 Lambsons Lane New CasJeDe 19720

## COMPOSITE FENDERING SYSTEM

Hardcore Composites 616 Lambsons Lane New Castle DE 19720

## COMPOUNDS

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

## COMPRESSORS

Hattapa Uetersener Maschinenfabrik Tomescher WEG 5-7 D-25436 Uetersen, Germany

## COMPUTER / COMPUTER SOFTWARE

Autoship Systems Corp. #403.611 Alexander St. Vancouver, BC, CANADA V6A1E  
Creative Systems, Inc., P.O. B. 1910, Port Townsend, WA 98368  
Fleet Technology, 311 Legget Dr., Karata Ontario, Canada K2K 1Z8  
Lloyd's Register, 100 Leadenhall St., London, England EC3A 3BP  
MIL Systems, 200-1150 Morrison Drive, Ottawa, Ontario K2H 8S9  
Navigator PC, Plantation Technology Park, 6601 N.W. 14th St Suite 4, Plantation, FL 33313  
Ship Motion Associates, 10 Danforth St. Portland, ME 04101

## COMMUNICATIONS

Beier Rad\*1990 Industrial Ave Harvey, LA 70058  
Immarsal Lid, 99 City Road London City EC1Y1AX England, UK  
Japan Radio, 1011 SW Klickitlay Way, Bldg B, Suite 100, Seattle WA 98134  
Mackay Comm Inc 2721 Discovery Dr Rakegh NC 27616-16  
Rydex, An Immarsal Ventures Co., 130-13111 Barter Place, Richmond,BC V6V2J1  
World-Link Communications, 74 Main St. Framingham,MA 01701

## COMPUTER SOFTWARE SYSTEMS

Autoship Systems Suite 312-611 Alexander St Vancouver BC V6A1E1  
Spec Tec Professor Kothly Vey 1366 Lysaker Norway

## CONSOLE GMDSS

Furuno USA, Inc, 4400 NW Pacific Rim Blvd., Camas, WA 98607  
Japan Radio, 1011 SW Klickitlay Way, Bldg B, Suite 100, Seattle WA 98134  
Mackay Communications, 2721 Disaiverry Dr, Raleigh, N.C. 27616-1851

## CONSULTANTS

Captain R.J. Underm t Associates, P.O. Box 1030 Groves, TX 77619  
Elliott Bay Design Group 5301 Sibioble Ave NW Ste 200 Seattle WA 98107

## CONTROL SYSTEM - Monitoring/Steering

Beier Radio1990 Industrial Ave Harvey, LA 70058  
Electric Marine Systems, 800 Fandale Pl., Railway, NJ, 07065  
Electrowave USA, 6125 W. Sam Houston Pkwy, Ste 406, Houston, TX 77041  
Governor Control Systems, 3190 S.W. 4th Ave., Ft Lauderdale, a 33315  
G.R. Bowler 2261 Lake Rd, Ontario, NY 14519  
Kobelt Manufacturing Co., Ltd, 8238-129 street Surrey, B.C. V3W0A6  
Kockum Sonics, Inc, 819 Veterans Blvd., Suite 201, Kenner, LA 70068  
MMC International, 60 Inp Dr, Inwood NY 11096  
Motor Services Hugo Stamp, 3190 S.W. Lauderdale, FL 33315  
Scientific Marine Services, Inc, 101 State Pl., Suite N, Escondido, CA92029  
Stork Kwant P.O. Box 23.6600 AA Snek, Netherlands  
Tano Corp 57017 Citrus Blvd, Suite E, New Orleans, LA 70123

## CORROSION CONTROL

Spectrum Trading 108-B Oak St/Alpharetta GA 30004  
Gardner Denver Water Jetting Systems 8807 Emmett Rd., Suite 100 Houston, TX 77040  
Ultra Strip 3515 SE Lionel Terrace StaurlfI 34996

## COUPLERS- Tug A Barge

Intercontinental Engineering, P.O. Box 9055, Kansas City, MO 64166

## COUPLINGS

Acromatic International Corp, 4710 Habana Ave, Tampa FL 33614  
American Yutai., 2525 Dundee Rd, Winter Haven, FL 33884  
Centa Corp, 815 Black Hawk Dr, Westmont IL 60559  
Geistinger, Hallwanger Landestz 3, 5300 Halhwang Sdzburg, Austria  
Geistinger Corporation, 200 Geislingndr Dve,Battle Creek, MI 49015  
Mapeco Products, 91 Wlenbrock Rd, Unit B, Oxford, CT 06478  
MMC Inn, 60 bap Drive, kiwood, NY 11096

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

E. Crane 241 Executive Dr. <3 Marion OH 43302  
Edgewater Machine & Fabricators, P.O. Box 358, Edgewater, FL 32132-0356  
Holy Hoist Corp., P.O. Box 86, St Clair Shores, MI 48080-0086  
Ijebherr-wetk Nenzing GmbH PO Box 10 A6710, Nenzing Austria  
Mi-Jack Products, 3111 West 167th Street, Hazel Crest IL 60429  
Westmont Industries, 10605 Painter Ave,Santa Fe SpmgS, CA 90670

## CRANKSHAFT DEFLECTION ANALYZER

Prisma Teknik AB Sweden, www.prisimateknA.nx

## CRANKSHAFT GRINDING

Goltens - New York Corp, 160 Van Brunt St., Brooklyn, NY 11231

## CRANKSHAFT REPAIR

Goltens - New Yak Corp, 160 Van Brunt St., Brooklyn, NY 11231  
InvPlace Machining 1929 N. Buffum St Milwaukee, WI 53212  
Waltz S Krenzer, 91 Wlenbrock Rd, Oxford, CT 06478

## CUTTING AND WELDING MACHINES

Bug-O-Systems, Inc., 3001 W. Carson St., Pittsburgh, PA 15204  
ESAB Cutting Systems, 411 South Ebenezer Road, Florence, X 29501

## DAMPERS

Geiskinger Corporation, 200 Geistinger Dnve,Battle Creek, MI 49015

## DATA RECORDERS

L3 Communications, PO Box 3041 Sarasota FL 34230-3041

## DECK MACHINERY — Cargo Handling Equipment

Edgewater Machine S Fabricators, P.O. Box 358, Edgewater, FL 3213241356  
Hattapa Uetersener Masdwnfabric Tomescher WEG 5-7 D-25436 Uetersen, Germany  
Intercontinental Engineering, P.O. Box 9055, Kansas City, MO 64168  
Lentec, 5827 Production Way, Langley, B.C. V3A4N5 Canada  
Markey Machinery, P.O.Box 24786, Seattle WA 96124  
Rapp Hydema, 4433 27th Avenue West Seattle WA 98199  
Seabulk Sytems 3851 Shel Rd Ste 200 Richmond, BC Canada V6X-2W2  
Skookum, He, P.O. Box 280, Hubbard, OR 97032  
Smith Berger Marine mc., 791510th Ave. S., Seattle, WA 98108  
Superior Lidgetwood-Mundy, 1101 John Ave., Superior, WI 54860  
Trmberland Equipment Ltd. t Almon Johnson, 459 Industrial Avenue, Woodstock, ON N4S7Z2 Canada  
W.W. Patterson 3 Riverside Rd Pittsburg, PA 15233

## DESALINATION - REVERSE OSMOSIS

G.E.T., he., 3135 Golden Avenue, Long Beach, CA 90806  
Pal Rodiem, 5775 Rio Ysta Drive, Clearwater, FL33760-3114  
Reverse Osmosis of South Florida, 12301 SW, 133 Court, Miami, FL, 33166

## DESIGN CONSULTING

Fleet Technologies, 311 Legget Dr, Kanata, Ont, K2K 1Z8 Canada

## DIESEL CYLINDER INDICATORS

Kiene Diesel, 325 S. Fairbanks St, Addison, IL 61011

## DIESEL ENGINE — Spate Parts A Repair

Caterpillar, Inc., Engine D., P.O. Box 610, MossUe, IL 61552-0610  
Cummins Marine, 4500 Leeds Ave., Suite 301, Charleston, SC 29405  
Deutz Canada Inc., 4420 Garand St., Montreal, Que, H4R 2A3  
GE Marine Engines 1 Neuman Way Cincinnati, OH 45215  
Giro Engineering Limited, Tafisman,Duncan Road,Park Gate,Southampton,Hants S031 7GA England  
Goltens Marine, 322 Broad Ave., Wilmington, CA 90744  
H.P.International, Inc., 3812 W. Linebaugh Ave., Tampa, FL 33624  
Industrial Estate, New Territories, HONG KONG  
MAN BiW Diesel AG, Stadtbachstrasse 1, D-861S3 Augsburg 1, GERMANY  
MAN BiW Diesel A/S, Tegtholmsgasse 41, DK-2450 Copenhagen SV, DENMARK  
MAN BiW Diesel, 17 State St., New York, NY 10004  
Marine Exhaust Systems of Alabama, P.O. Box 698, 757Nichols Ave., Faithope, AL 36533  
Marine Turbo B Diesel Inc 1090 7th St Richmond CA 94601  
Mariso USA, Inc., 100 Davidson Ave., Somerset NJ 08873  
Motor-Service AB, Box 2115, S-144 04 Ronninge, SWEDEN  
Motor Services Hugo Stamp, 3190 S.W. 4th Ave., Ft Lauderdale, FL 33315  
NREC 1701 Engineers Rd Belle Chase LA 70037  
Reagan Equipment 2550 BelleChase Hwy, Greta, LA 70054  
Rohs -Royce Commercial Marine Houston 10255 Richmond Ave  
Scardania Americas Bkg 502 Empire St., Greehki Park, J4V1V7 Canada  
Warska Diesel, 201 Defense Highway, Annapaks, MD 21401

## DIESEL ENGINE OVERHAUL

Goltens - NY Corp., 160 Van Brunt St., Brooklyn, NY 11231  
Governor Controls Systems 3190 W. 4th Ave Ft Lauderdale FL 33315  
Marine Turbo Diesel Inc 1090 7th St Richmond CA 94601

## DIESEL FUEL DECONTAMINATION (www.bunkerbuoyer.com)

Algae X Intl PO Box 4011 Ft Myers Beach, FL 33932  
PRI3750 Hacienda Blvd., Suite A Davie, FL 33314

## DIGITAL TORQUE METER SYSTEMS

Instruments, Computers & Controls 78 Londonderry Tpke Hooksset NH 03106

## DIVING A SALVAGE

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70176  
H.J. Merthue, PO. Box 23123, New Orleans LA 70163

## DOCK FENDERING SYSTEMS

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

## DOORS - MARINE A INDUSTRIAL

Juniper Irrm,72-15 Metropolitan Ave., Middle Village, NY 11379  
Manly Manne, PO Box 86788, N. Vancouver, BC, Canada V7L4L3  
Mapeco, Inc., 90 Forest Ave., Locust Valley, NY 11560  
Walz S Krenzer, 91 Wlenbrock Rd, Unit B4, Oxford CT 06478

## DRIVES

Allied Systems 2300 Oregon St Sherwood OR 97140

## DRUG TEST KITS

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

## DRY DOCKS-Design

Crandall Dry Dock Engineers Inc., P.O. Box 505804, Chelsea, MA 02150  
Heger Dry Dock Engineers, Inc., 13 Water St. Hoxston, MA 01746

## ELECTRICAL EQUIPMENT

Callenberg Equipment 2010 N. Miami Ave. Manx, FL 33127  
MMC International, 60 Inp Dr, Inwood NY 11096

## ELECTRONIC INFORMATION SUPPORT

Scandinavian Micro Systems, P.O. Box 155, N-1411 Kdbolon, NORWAY  
Scientific Marine Svcs., 101 State Pl., Ste. F, Escondido, CA 92029

## ELECTRICAL INSTRUMENTS

Selco USA, 2506 Lake Brook Ct, Atlanta, GA 30360

## ELECTRONIC CHARTS

C-Map Commercial 133 Falmouth Rd, Mashpee, MA 02649Mahne Electronics  
NOAA Office of Coast Survey, 1315 East-West Hwy,Silvestrspring, MO 20910  
Solutions, 1522 Crabapple Cove, Jacksonville, FL 32225

## ELECTRONICS

OMAP, P. O. Box 212,4371 Egeursund Norway  
Furuno USA, mc., 4400 NW Pacific Rim Blvd., Camas, WA 98607  
Sure Seal Connections, 3951 South Plaza Dr. Suite 240, Santa Ana, CA 92704  
Standard Horizon, 10900 Walker St., Cypress, CA 90630

## EMPLOYMENT

AJ American Marine PO Drawer 191237 Tlmai's Comer, AL 33619  
Mataty Sealtl Command PO Box 120 Code APM-124 Virginia Beach,VA 23458-0120

## ENGINE ROOM LIGHTING/MONITORING A CONTROL

GMT Electronics, 171 Main Street South River, NJ 08882  
Mackay Communications, 2721 Discovery Dr, Raleigh, N.C. 27616-1851

## ENGINE ROOM REPLACEMENT PARTS

Marisco USA, Inc., 100 Davidson Ave., Sommereet NJ 08873

## ENGINES

GE Marine Engines, 1 Neuman Way, Cincinnati, OH 45215  
Warska NSD Corporation, box 252, Vasa, (inland Fin-65101

## EQUIPMENT RELIABILITY ANALYSIS SOFTWARE

Resurgence Software Inc, Advanced Technology Center, 2021 Ukeshore Drive, Suite 210, New Orleans, LA 70122

## EVACUATION SYSTEMS

DBC, 12351 Bridgeport Rd., Richmond, BC Canada  
Fleet Technology 311 Legget Dr Kanata Ontario K2K1Z8

## EVAPORATORS

Alfaival Separation, Inc., 955 Meams Rd, Warminster, PA 18974  
Sasakura Engineering, 7-32 Takeshima, 4-home, Nishiyodogoway, KY, Osaka555, Japan



Kockum Sorties, Inc., 933 Industry Rd., Ste105, Kenner, LA 70062  
Leica Navigation, 23868 Hawthorne Blvd., Torrance CA 90505-5908  
Marine Electronic Solutions 1522 Crabapple Cove, Jacksonville, FL 32225  
Raytheon Marine GmbH, High Seas Products, Postfach 1166  
D-24100 Kiel, Germany

(Distributor for Raytheon) Klein Navigation, 11 Klein Drive, Salem NH 03079  
Saab Marine Electronics AB, Box 13045, 402 5Göteborg, SWEDEN  
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboten, NORWAY  
Scientific Marine Services, Inc., 101 State Pl., Suite F. Escondido, CA 92029  
Standard Horizon, 10900 Walker St., Cypress, CA 90630

#### MARINE ENGINEERING

Elliott Bay Design Group, 5301 Shishole Ave. NW, Ste. 200, Seattle, WA 98107

#### MARINE EQUIPMENT

Baltic Spare Services Ltd 8 Astronomodom St., 80-299 Gdansk, Poland  
Commercial & Marine Products, 3924 Forest Dr., #11, Columbia, SC 29204  
Plastic Pilings Inc., 1485 South Willow Ave., Rialto, CA 92376  
Scardana Americas Bkg., 502 Empire St., Montreal, Greenfield Part, J4v1v7  
Superior LKJgerwood-Mundy, 1101 John Ave., Superior, WI 54880  
Waterman Supply, P.O.Box 596, Wilmington, CA 90748

#### MARINE HARDWARE

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

#### MARINE RADIOS

Standard Horizon, 10900 Walker St., Cypress, CA 90630

#### MARINE SERVICES

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

#### MARINE THERMAL IMAGER

Arion International 720 Glen Eagle Drive #100 Winter Springs, FL 32708

#### MARITIME TRAINING & SCHOOLS

Marine Safety Intl., Marine Terminal Laguardia Airport, NY 11371

#### METAL ALLOY DISTRIBUTORS

Diversified Metals 49 Main St Monson, MA 01057

#### METERS

Seico USA 2508 Lakebrook a, Atlanta, GA 30360

#### MONITORING SYSTEMS

GR Bowler 2261 Lake Rd Ontario, NY 14519

Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851

#### MOORING LINES

Bayer Faser Building F18 DV Marttg Monofil 41538 Dormagen, Germany

#### MOORAGE FACILITY

Sea Atk Marine, PO Box 210, Monticell.oAR 71655-0210

Washington North Tongue Point 1300 Dexter Ave., N. Ste 205 Seattle, WA 9810

#### MOTOR PROTECTION

Marine Safe Electronics, 261 Millway Ave. #12, Concord Ontario L4K 4K9

#### MOUNTING SYSTEMS

Machine Support 1932 Mill Pond Dr Chesapeake, VA 23320

#### NAVAL ARCHITECTS, MARINE ENGINEERS

A.K. Suda , inc., 3004 19th St., Metairie, LA 70002-4989

Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063

Band, Lavis, & Associates, 900 Ritchie Hwy, Suite 203, Severna Park, MD 21146

Bay Engineering, 253 N. First Ave., Sturgeon Bay, WI 54235

C. Baxter & Associates, P.O. Box 9006, Mobile, AL 36609

CDI Marine Co., 9550 Regency Square Blvd. Ste. 400, Jacksonville, FL 3222

Computer Sciences Corporation-Advance Marine Center, 1201 M St. SE, Washington, DC 20003

CT Marine, 56 Crooked Trail, Rowayton, CT 06853

Cunningham & Walker, 1762 Providence Hollow Lane, Jacksonville, FL 32223

DeJong & Lebel, Inc., 1734 Emerson Street, Jacksonville, FL 32207

Designers & Planners, 2120 Washington Blvd. Ste.200, Arlington, VA 22204

Elliott Bay Design Groop 5301 Shishole Ave NW Ste 200 Seattle WA 98107

Fleet Technology, 311 Leggett Dr., Karata, Ontario, Canada K2K1Z8

George G. Sharp, Inc., 100 Church St., New York, NY 10007

Guido Peria & Assoc., 720 3rd Ave., Ste. 1200, Seattle, WA 98104

James S. Krogen, 799 Brickell Plaza Ste. 701, Miami, FL 33131

Jamesston Marine Service, Marine Science & Tech Center 1084 Shennessossett Rd  
Groton, CT 06340

John J. McMullen Associates, Inc., 4300 King St., Suite 400, Alexander, VA 22302

John W. Gilbert & Assoc., Inc., 199 State St., Boston, MA 02109

Kvaerner Masa Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401

M. Rosenblatt 8, Son, Inc., 2341 Jefferson Davis Hwy, Arlington, VA 22202

Marine Design & Operations, Inc., 225 E. 1st Ave., Roselle, NJ 07203

Maritech, Seaciff, Bay Road, Newmarket, NH 03857

Maritime Design, 13000 Sawgrass Village Circle, Ponte Vedra Beach, FL 32082

MCA Engineers, Inc., 2960 Ailway Ave., #A-103, Costa Mesa, CA 92626

McEroy Machine S Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 3953M454

MH Systems 10851 Sorrento Valley Rd#2F San Diego CA 92121

MLL Systems, 200-1150 Morrison Drive, Ottawa, Ontario K2H 8S9

Nautical Designs, Inc. 2101 S. Andrews Ave, Suite 202, Fori Lauderdale FL 33316

R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073

R.J. Melius & Co., 71 Hudson St, New York, NY 10013

Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112

Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

Sea School, 10812 Gandy Blvd, St. Petersburg, FL 33702

Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426;

The Glosten Assoc. Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104

TIMSSCO, P. O. Box 91360, Mobile AL 36691

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

#### NAV/COMM EQUIPMENT

Beier Radio 1990 Industrial Ave, Harvey LA 70058

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

C-Map, P.O. Box 212 4371 Egersund Norway

St. Johns, Newfoundland, Canada A1A 2GB

Chartco, New North Road, Hainault, Iford Essex, 166 2UR England, UK

Electronic Marine Systems, 800 Ferndale Pl., Rahway, N.J. 07065

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

Mackay Communications, 3691 Trust Dr., Raleigh, NC 27616

Scandinavian Micro Systems P.O. Box 155, N-1411, Kolboten, NORWAY

Standard Communicatiosis, P.O. Box 92151, Los Angeles, CA 90009

Transas Marine USA, 19105 36th Ave. W. St 101, Linwood, WA8036

#### NAVIGATION

Convay Marine Ltd.#15-13511 Crestwood Pl., Richmond, BC V6V2G1

DSB Technologies, 1400 S.Oriand Ave., Winter Part, FL 32789

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

Nauticast AG, Mariahilfer Strasse 50/11A-1070 Vienna, Austria

Transas Marine USA 19105 36th Ave West Ste 101 Lynnwood, WA 98036

#### NOZZLES/NOZZLE SYSTEMS

Hazzles/Horton, 6720 124th Ave, Fennville, MI 49408

NautiCAN Research and Develop.P.O. Box 428-115 Kelvin Grove Way, Lions  
Bay, BC VON 2E0

#### OFFSHORE MARINE CONSTRUCTION

Amfeis 5177 Richmond Ave Ste 1065 Houston TX 77056

#### OFFSHORE TOWING

Tidewater, 601 Poydras Street, New Orleans, LA 70130

#### OILWATER SEPARATORS

Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974-0556

MMC International, 60 Inip Dr, Inwood NY 11096

Sasakura Engineering, 7-32 Takeshima, 4-chomNishiyodogawa, KY, Osaka555,  
Japan

#### PAINTS/ANTI-FOULANTS

Jotun Paints inc. 1401 Severn St, Baltimore, MD 21230

Sigma USA, PO Box 816, Harvey, LA 70059

Wasser High Tech Coatings, 8041 New Albany, IN 47115-1026

#### PAINT REMOVAL

Ultra Strip Systems 3515 SE Lionel Terrace Stuart, FL 34996

#### PARTS LOCATOR SERVICE

Inventory Locator Service 3965 Mendenhall Rd, Memphis, TN 38115

#### PDF's (Personal Flotation Devices)

Steam's Mfg Co. PO Box 1498 St Cloud, MN 56302-1498

#### PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS

GS-Hydro U.S., 1395 Bluehills Ave, Bloomfield CT. 06002

Jesse Engineering, 5225 7th St. East, Tacoma, WA 8424

Neptune Research, 1685 Latham Rd., West Palm Beach, FL 33409

Norma Products (U.S.) Inc. 31132

Century Drive, Wrxmon, MI 48393

#### PIPE LEAK REPAIR

CSD Norm America 88o Canada Rd, Manchester, NH 03109

#### POLLUTION CONTROL PRODUCTS

Enecon Corporation, 125 Baylis Rd., Melville, NY 11747-3800

#### PORTABLE FOAM APPLICATORS

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

#### PORTABLE VENTILATORS

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

#### PORT DEVELOPMENT

RTM Star Center. 2 W.Dixie Hwy, Dania, FL 33004

Sasakura Engineering, 7-32 Takeshima, 4-chome, Nishiyodogawa, KY, Osaka555,  
Japan

#### PRECISION FLAME CUTTING/SAWING

Ronson Technical, 2146 B Flintstone Dr, Tucker, GA 30085

#### PRESSURE INDICATORS

Lehman & Michaels GmbH & Co. kg

Marlow Ring 4, D-22525 Hamburg Germany

#### PREVENTATIVE MAINTENANCE

Marine Safe Electronics 37 Staffern Dr Concord Ontario L4k 242

#### PULPUSION EQUIPMENT

ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201-0372

ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND

ABB TURBOCHARGER, INC., 1460 Livingston Avenue, North Brunswick, NJ 08902

AlstomPower Conversion, 3 Ave. des Trois Chenes 90018 Belfort Cedex France

Brunvoll A/S, P.O. Box 370, N-6401, Molde, Noiway

Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320

Centra Corp, 8185 Cass Ave., Darien, IL 60561

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

Fincantieri, Diesel Engines Div—GMT, Bagnoli della Rosandra 3334, Trieste, ITALY

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

Goltnes Worldwide, 160 Van Brunt St., Brooklyn, NY 11231

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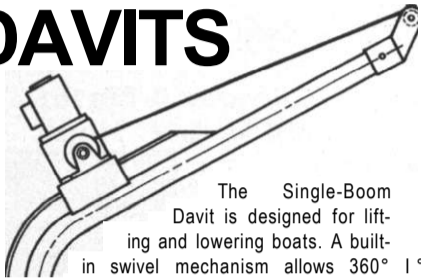
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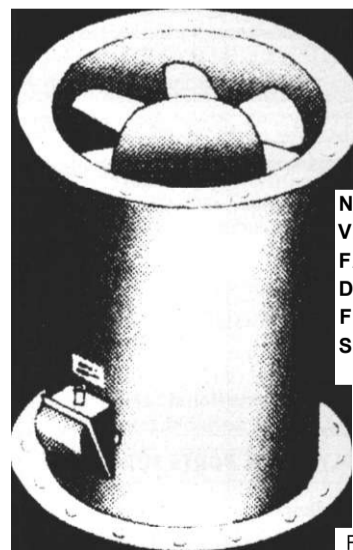
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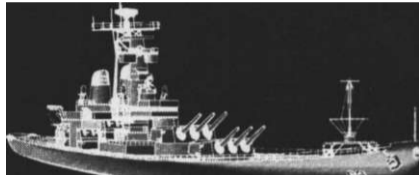
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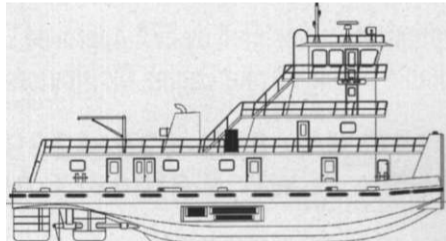
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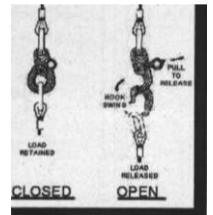
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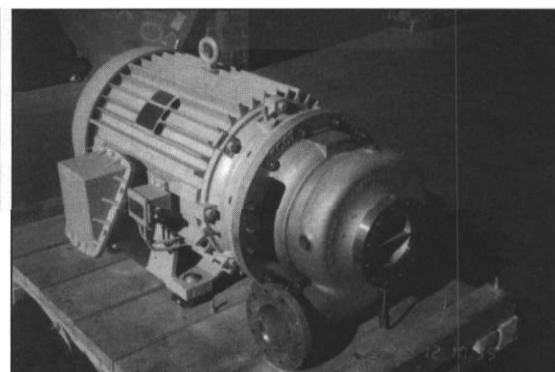
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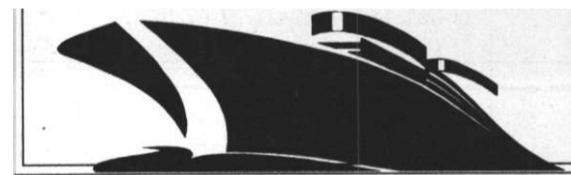
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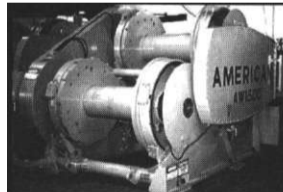
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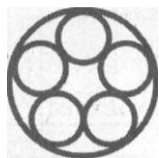
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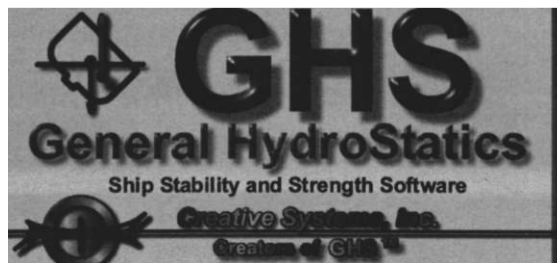
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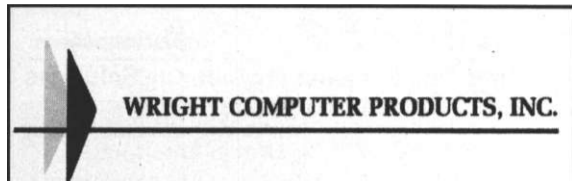
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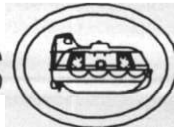
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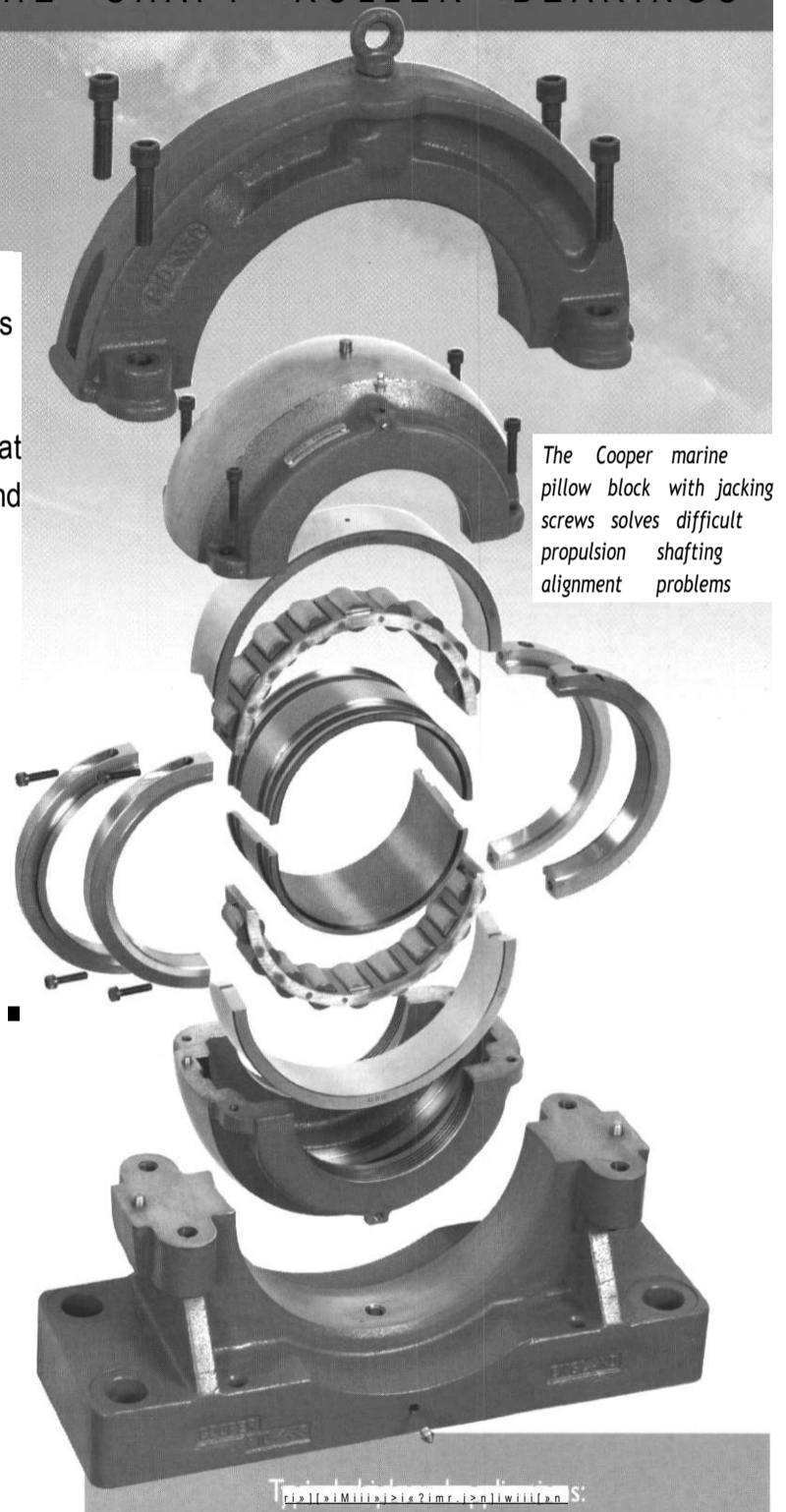
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