May 2004

MARITIME REPORTER
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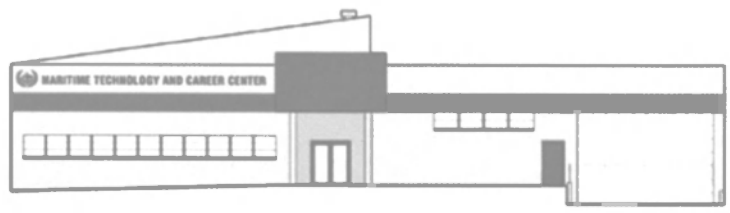

TRADITION WITH TECHNOLOGY: PMI's new 15,000 square-foot training facility is located at 1729 Alaskan Way South, Seattle, Washington 98134. The facility will include a DNV Class A full-mission, Transas Ship Simulator. Please join PMI and Seattle Mayor Nickels at our Open House on Industry Day, June 11, 2004. RSVP to Marci Eversole, Philips Publishing Group, at (206) 284-8285 or via e-mail at marci@rhppublishing.com. You may also contact Gregg Trunnell, PMI Director, at (206) 719-2801 or via e-mail at gtrunnell@mates.org.

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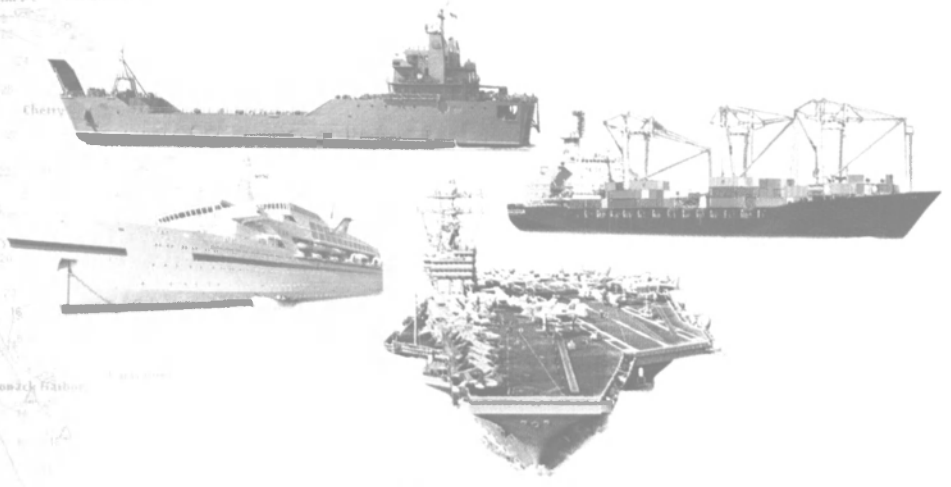

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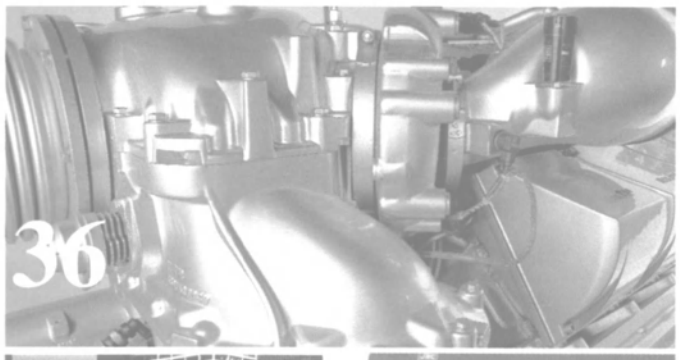

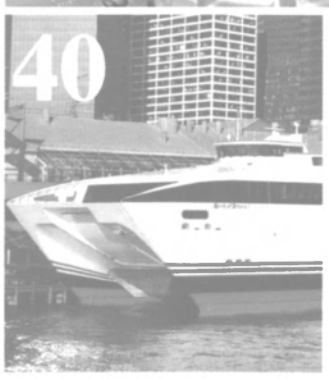

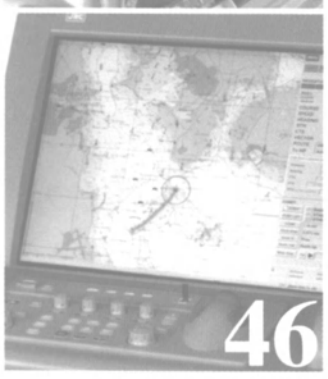

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Thrane & Thrane Acquires EuroCom Industries

EMG EuroMarine Electronics GmbH sold its 88.6-percent stake in ECI EuroCom Industries A/S, Alborg, Denmark to Denmark's Thrane & Thrane A/S for approximately EUR 14 million. EuroCom Industries is among the leading suppliers of marine telecommunication electronics. With its workforce of 225, it generated in 2003 sales of EUR 47.5 million and, after the successful turnaround in 2003, an EBIT of EUR 4.6 million. By acquiring the majority stake in EuroCom Industries, Thrane & Thrane rounds off its portfolio of maritime communication products.

Multraship Picks GE Power for New Tug

Shown is the first Carrousel tug, which was a retrofitted vessel. In 1999, Multraship Towage & Salvage's Multratug 12 was converted into the world's first Carrousel tug.

Dutch towage and salvage group Multraship and GE Marine announced that GE's 12-cylinder 7FDM diesel engines have been selected to power a new tugboat being built for Multraship. It will be the first newbuild to incorporate the Carrousel system licensed by Rotterdam-based Novatug. The tug will use two GE medium-speed diesel engines, each rated at 3,070 shp for total system propulsion of 6,140 shp. A shipyard is now being selected to build the 78.7-ft. vessel, which is expected to go into service in the harbors of southern Holland in early 2005.

Circle 66 on Reader Service Card

First of Three Tugs Delivered to Indian Navy

The first of a three-vessel order has recently been delivered to the Indian Navy by the Tebma Shipyard located on the Indian East Coast. Each tug is to be powered by a pair of V-12 cylinder Cummins KTA38M2 main engines each developing 1,200 hp continuous duty at 1,800 rpm. The 2,400 hp tugs have a 25-ton bollard pull. Engines for the second vessel in the series have just been delivered to the shipyard.

The designation INS denotes the vessel as Indian Naval Service. The Tebma Shipyard builds a wide range of vessels from dredges to larger passenger ferries and megayachts.

USS Ronald Reagan Redelivered After PSA

Northrop Grumman Corporation successfully redelivered USS Ronald Reagan (CVN 76), to the U.S. Navy after a post shakedown availability (PSA). The Ronald Reagan returned to the company's Newport News sector shipyard in December for the PSA, a typical availability in the early life of a carrier that allows the Navy and Newport News team to resolve any items that came up during early cruises and make any last-minute changes and upgrades. Work performed under this contract is valued at $53 million and included a third physical fitness center for sailors, combat system and radar equipment upgrades, and minor repairs.

The Index

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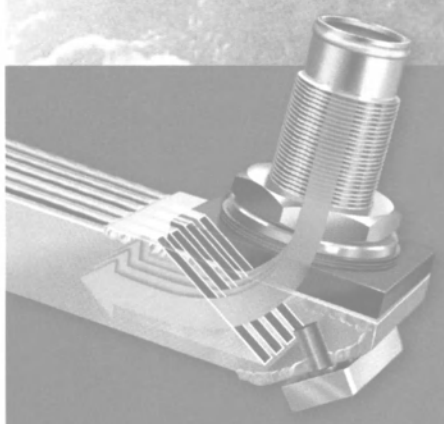

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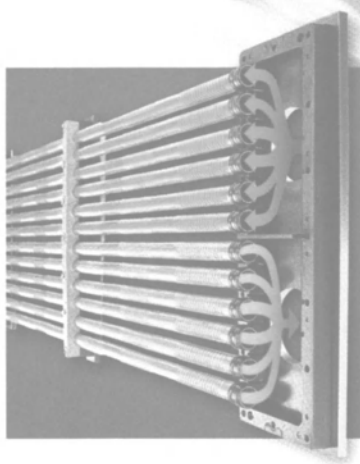

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Editor's Note

I, personally, have never met a deadline that I have not either battered, broken or despised. Ironic, considering the number of daily, weekly and monthly deadlines I must meet in the course of producing the plethora of printed and electronic information products created by The Maritime Group.

Deadlines are no stranger to the maritime industry, and though accustomed to meeting them on a regular basis, no date looms more imposing than **July 1, 2004**, which will usher in a new and presumably superior era of maritime security around the globe.

While much attention and many dollars are focused on getting as many companies as possible in compliance with the rules of the ISPS code by that date, a recent round of discussions with U.S. Coast Guard officials and industry leaders has convinced me that the only thing more assured than the arrival of July 1, 2004 is the fact that a very significant percentage of ships and ports *will not* meet the requirements by the deadline. It is impossible to guess percentages, and frankly, the actual number of those "in compliance" versus those not is not my point.

The changes embodied in ISPS and subsequent maritime security measures — whether enacted on the international, national or regional level — will have a profound, deep and lasting impact on the maritime industry for generations. Lack of the the ISPS stamp — for lack of a better term — on July 1 for an arriving ship or its last port of departure, does not mean that the ship will automatically be turned away from U.S. ports. The U.S. Coast Guard, charged with ensuring the safety of U.S. ports and enforcing the letter of the law, conversely has no desire to bring U.S. commerce to its knees. Based on a thorough and secret risk analysis, the USCG will deal with non-conformists on a per-case basis, and will employ an escalating set of procedures to ensure that ships arriving in U.S. ports are delivering goods, not harm.

That said, it is clear that quality shipowners — ie. shipowners that have a history demonstrating the acquisition, maintenance and operation of a quality fleet while adhering to accepted codes — will have a much easier voyage in the timely arrival and departure in the U.S. Taking this one step further, it can be assumed that vigilance in security matters will help to increasingly expose and eliminate the threat of subpar ships, a situation that justly rewards companies that invest the time and capital to ensure its fleet is designed, built, outfitted and maintained, as well as crewed and staffed, in the highest quality manner possible.

That said, its time to go. I'm past deadline.

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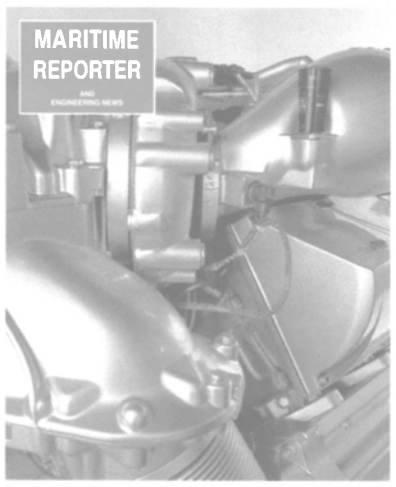
On the Cover



Pictured on this month's cover is the new MTU 2000 CR, featured on page 36 as part of this month's Propulsion Technology focus, which starts on page 26.

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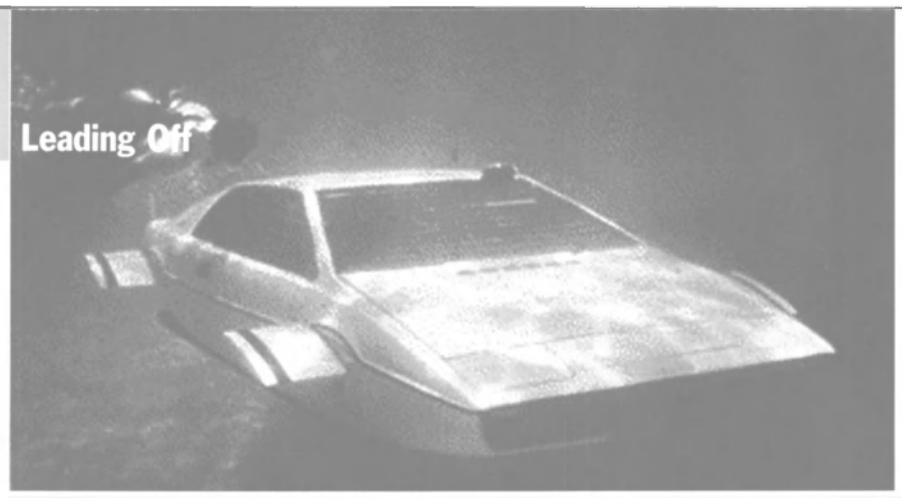


Product: Lotus Submarine

Company: Martin Marietta Aero & Naval

Circa: 1980s

The Lotus submarine created by Perry Technologies for the James Bond movie.

(Photo Courtesy Lockheed Martin)

Maritime Meanings

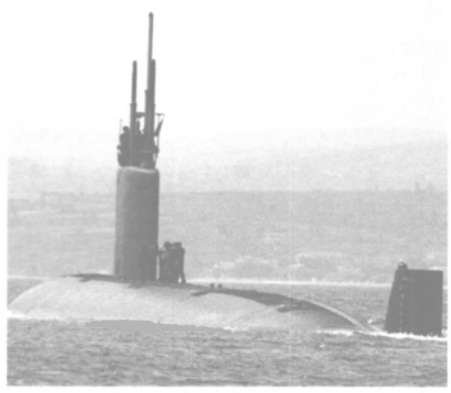
Mayonnaise

A sauce made with pepper, salt, oil, vinegar, egg yolk and sometimes other seasonings, beat up together into a thick paste. Not a nautical word, but certainly nautical in origin. When the Duc de Richelieu captured Port Mahon, Minorja, in 1756, he came ashore and demanded to be fed. There being no prepared meal, he took whatever he could find and beat it up together, hence the original form mahonnaise, which in English became the modern mayonnaise.

John Byng, the English admiral in charg e of relieving the British garrison that the French had put under siege on Minorca, was court-martialled for failing to do his utmost to recapture the island. He was found guilty and sentenced to death, and finally was shot on the quarterdeck of HMS Monarch in 1757. His execution inspired Voltaire's famous remark that in England it was sometimes necessary to shoot an admiral pour encourager les autres ("to encourage the others").

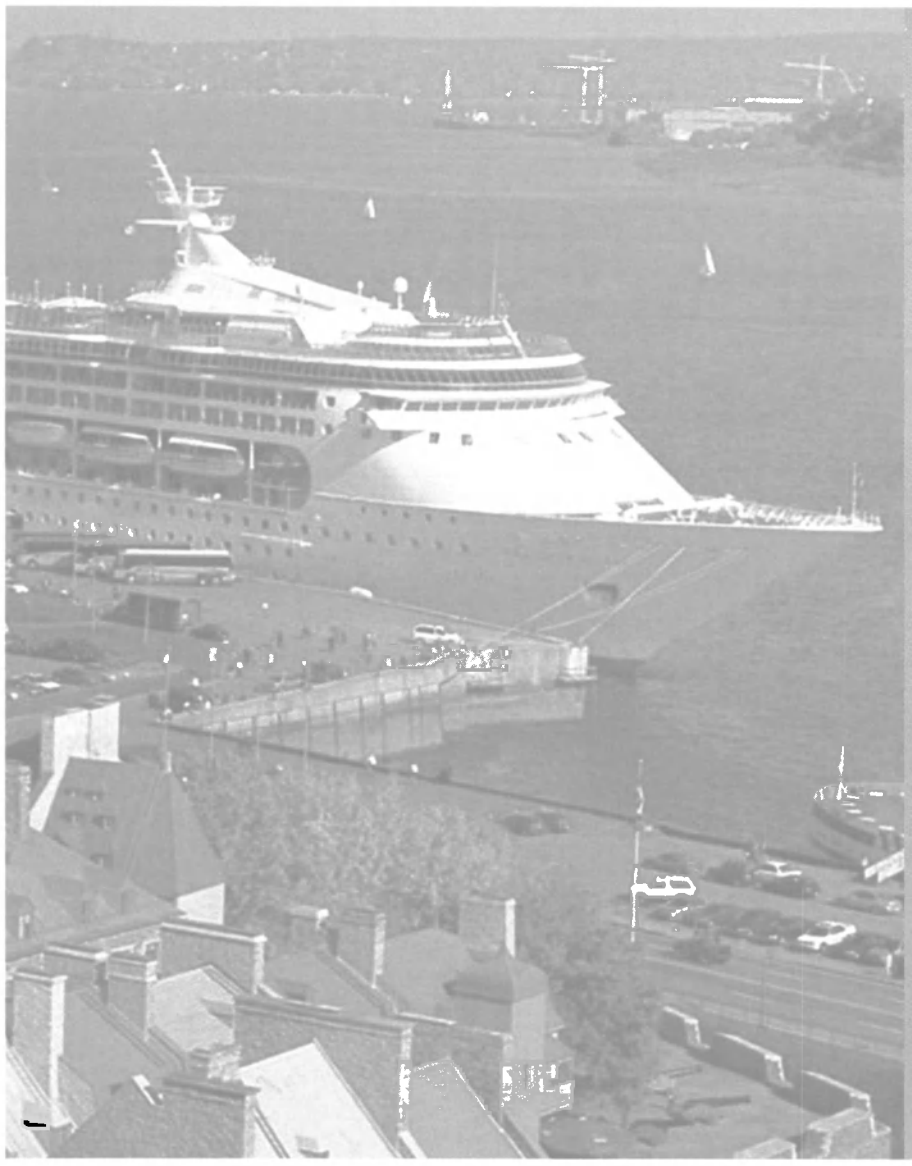
***Source**: An Ocean of Words: A Dictionary of Nautical Words and Phrases, by Peter D. Jeans; Birch Lane Press , 1998*

On Top of the World ... Literally



The fast-attack submarine USS Hampton (SSN 767), along with the Royal Navy submarine HMS Tireless, surfaced through the ice at the North Pole April 19. The two vessels surfaced through two naturally occurring leads or "gaps" in the ice about one-half mile from each other, following joint operational exercises beneath the polar ice cap. "It's a pretty amazing ship, and I'm happy to be a part of it," said Cmdr. **Robert P. Burke**, Hampton's commanding officer. "A lot of preparations and planning are involved in operating a submarine under the ice. After just completing a six-month deployment in December, it took a lot of dedication and training by the entire crew to get us here." Both the Tireless and Hampton crews met on the ice, including scientists traveling aboard both submarines to collect data and perform experiments. The two crews had hoped to play an impromptu game of soccer on the ice cap, but the game was called off due to "conditions on the pitch" that had several feet of snow on the ice.

(By Chief Journalist (SW/AW)
Mark O. Piggott, Commander,
Naval Submarine Forces, Public Affairs)



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Fincantieri Delivers Westerdam

On April 17 Fincantieri, based in Marghera, delivered the Westerdam cruise ship to Holland America Line, part of the Carnival group. The ship is the third of a total of four ships to be completed by early 2006. The deadline set by Fincantieri for its delivery has been met despite a fire that broke out in the shipyard last October, damaging three decks. The official presentation ceremony for Westerdam took place on April 25 at the Marittima station in Venice. The 82,000-tons, $400-million ship has a gross tonnage of , measures 290 m long and has a carrying capacity of 3,200, including 2,400 passengers and 800 crew. The Westerdam follows recent trends in cruise ship design, with 85 percent of its rooms offering outside

views. The ship is part of the 13-ship Vista Class category.

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"World's Largest" Heavy Lift Ship Enters Service

Heavy lift specialist Jumbo enters its heavy lift vessel MV "Jumbo Javelin" newbuild into service after having been mated with cranes successfully and passing final sea trials in the North Sea.

With its 1,600 tons lift capacity, a hold space of 19,000 cu. m. and a main deck of 2,650 sq. m., MV Jumbo Javelin is without contest the largest heavy lift ship in its class in the world. She is the first in a series of two new ships ordered by Jumbo. MV "Jumbo Javelin" will be

joined by its twin sister vessel MV Fairpartner in September. The ships will boost the Jumbo fleet to a total of 12 units. On its commercial maiden voyage Jumbo Javelin will load a combination of power plant material and petrochemical equipment from Dutch and Italian ports for destinations in Bahrain, Qatar and Iran. The heaviest cargo item is a reactor column — weighing 620 tons weight and measuring 61.06 x 9.736 x 9.878 m — for the styrene monomer plant of the ninth olefin project in Bandar Assaluyeh, Iran.

Damen Delivers Pair of Tugs

Damen Shipyards Gorinchem recently delivered a pair of Stan Tug 2608s — Ilha de Sao Luis and O Bravo — in fulfilment of its contract with Adminstracao dos Portos, which was signed in June 2003. The vessels are for operation in the Port of Horta and the Port of Praia da Vitoria. The first vessel was delivered in February 2004 and the

Main Particulars

Length, o.a.	85.6 ft. (26 m)
Beam, o.a.	26 ft. (7.9 m)
Depth	13.3 ft. (4.05 m)
Draft aft	10.1 ft. (3.1 m)
Tonnage	195 gt
Classification	LR
Main engines	Caterpillar
Propulsion	Van de Giessen Nozzles
Generators	Two Caterpillar 3304B NA diesel engines .One Lister DSW 4 diesel engine, driving a 30 kVA Newage Stamford BCM 184 H harbor generator.
Gears	Reintjes
Radar	Furuno
VHF	Sailor
Autopilot	Radio Zeeland
Bollard pull	30.7 ton
Speed	12.3 knots
Fuel oil	75.7 cu. m.
Fresh water	18.3 cu. m.
Dirty oil	2.0 cu. m.
Lubrication oil	2.0 cu. m.
Sewage	1.8 cu. m.
Sludge	2.3 cu. m.
Foam	5.1 cu. m.
Dispersant	2.7 cu. m.
Water ballast	19.4 cu. m.

second vessel in March 2004. The pair were built from stock hulls with the yard numbers 509805 and 509806. Both vessels will be used for mooring operations, coastal towing and fire fighting operations.

The Damen Stan Tug 2608 has a single chine bilge. The transom corners are well rounded and the vessel has sufficient bow height for severe working conditions. The hull is divided into four compartments and is of a very strong construction with side and bottom plating of 10 mm and decks of 8 mm thickness. The sheerstrake has a plate thickness of 20 mm.

The aft deck is suitable for a specific weight of two tons per square meter and is designed to carry loads up to approximately 20 tons. The superstructure has ample space for a separate galley and mess room.

The accommodation is suitable for a crew of nine, with the captain's cabin and the chief engineer's cabin on the main deck.

Below the main deck, two double crew cabins and a triple crew cabin are arranged. Furthermore a large store is fitted. The complete accommodation and the wheelhouse are air-conditioned.

Two eight-cylinder, resiliently mounted Caterpillar 3508B TA engines power the Damen Stan Tug 2608. The output of each main engine is 820 kW (1,100 bhp) at 1,600 rpm.

Each engine drives a 1900 mm bronze fixed pitch propeller in a NSMB type 37 nozzle for improved astern performances. Each nozzle is provided with a stainless steel inner ring. Reintjes reverse/reduction gearboxes are fitted, type WAF 562L, with a reduction ratio of 5.05:1.

The communication equipment includes a Sailor RT 4822 VHF radiotelephone fitted with integrated DSC modem/ watch receiver, a Furuno FS-2570-25 SSB, with integrated watch receiver and DSC and two Jotron VHF handheld are foreseen. The Navtex is a Furuno NX-500.

The navigation equipment consists of a Furuno radar, type FR-1505 mk III, a Furuno GP-80 GPS navigator and a Furuno GD-1700 chart plotter with echo sounder. The autopilot is of the make Radio Zeeland, type Seapilot 75. The vessels were classified by Lloyd's Register of Shipping.

Circle 43 on Reader Service Card

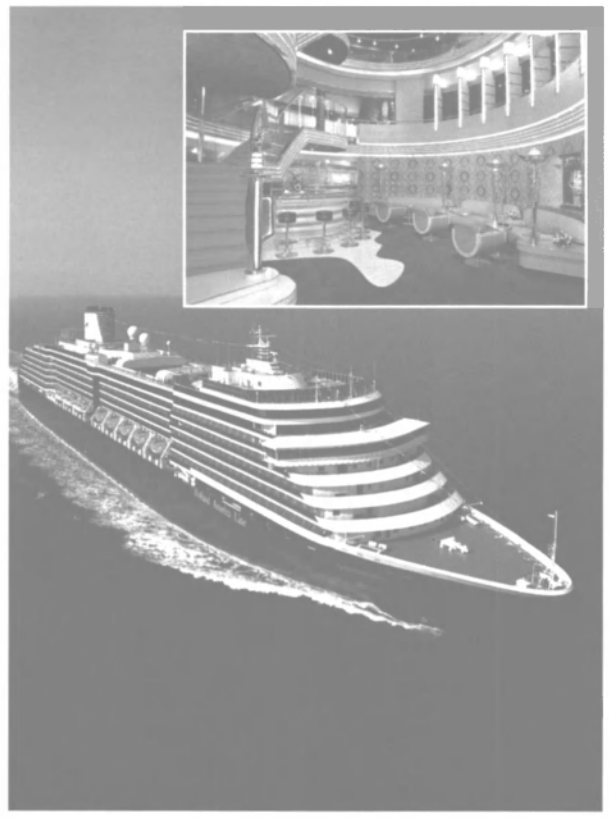
Not Just Another Dam Ship

In 2003, Holland America (HAL) added another "Dam" ship to its fleet in the form of the 82,000-gt MS Oosterdam. Oosterdam — built at the Fincantieri shipyard in Marghera, Italy — is the second 1,848 passenger Vista-class ship for the company, joining sister ship ms Zuiderdam, which debuted in December 2002. The 951-ft. ship, delivered in July 2003 in Rotterdam, was introduced with an inaugural sailing out of Port Everglades in December 2003. Upon first glance of the interior of the ship, the European influence, distinctive decor, influx of amenities and impeccable service embodies the cruiseline's $225 million Signature of Excellence initiative. **Frans Dingemans**, along with a team of architects and designers, molded the unique ambiance aboard the latest HAL ships. Along with Dingemans' original designs, HAL ships, including the Oosterdam, showcase millions of dollars worth of antiques and old master artworks. Perhaps the most notable difference between Oosterdam and its sistership is the color scheme and the ambiance. The Zuiderdam, which infuses a brighter color palette differs from the more subtle Oosterdam. While the new Vista class ships share an aesthetic beauty, the technical modifications provide a different realm of sophistication. Among the technical advancements for the Vista-class ships includes adding a gas turbine to the vessel. According to HAL, the gas turbines allows for use of one less diesel engine, so it has five 16-cylinder Sulzer medium speed diesel power plants. The Oosterdam sails at 24 knots, driven by a pair of 17.4-MW Azipods.

The design of the engine room adds to the innovative advancements. The engines are situated in two separate spaces that can be completely closed off from each other so that in the event of an emergency in one engine room, power systems in the other will still provide sufficient propulsion and electrical power to return the ship safely to port. The GE gas turbine also located in a separate space provides a third backup system and allows the ship to operate without visible pollution in sensitive areas such as Alaska.

According to **Stein Kruse**, senior vice president of fleet operations, "the ms Oosterdam, represents the very latest thinking in ship-building technology, from navigational tools to environmental protection."

The multi-million dollar Rochem sewage system enables the Oosterdam to have little impact on the environment. The system allows the gray water to be recycled and used for various technical aspects on the ship such as cooling water. HAL continues to work on a system that will allow the ships to recycle ballast water. Like its sister, Oosterdam boasts a spacious design for public areas and staterooms where 85 percent of its staterooms have ocean views, with 67 percent of all staterooms sporting verandahs.



Oosterdam is lucky number 13 in the Dam fleet, with two more on the way. HAL recently announced that the line's fourth Vista-class ship, scheduled for delivery in January 2006, will be named MS Noordam.

New Diamond Princess Delivered in Japan

In Nagasaki, Japan, the 116,000-ton, 2,670-passenger Diamond Princess was delivered to Princess Cruises by Mitsubishi Heavy Industries, Ltd. (MHI). The ship is a new design for Princess and makes history as the first large cruise ship built in Japan in more than a decade. The vessel incorporates Princess' trademark design philosophy — an abundance of balcony cabins, flexibility in dining and entertainment options, Princess' renowned service and a variety of intimate spaces — giving the ship all of the choice of a large ship with the feel of a much smaller vessel.

Circle 51 on Reader Service Card

Main Particulars

Length, o.a.	85.6 ft. (26 m)
Beam, o.a.	26 ft. (7.9 m)
Depth	13.3 ft. (4.05 m)
Draft aft	10.1 ft. (3.1 m)
Tonnage	195 gt
Classification	LR
Main engines	Caterpillar
Propulsion	Van de Giessen Nozzles
Generators	Two Caterpillar 3304B NA diesel engines .One Lister DSW 4 diesel engine, driving a 30 kVA Newage Stamford BCM 184 H harbor generator.
Gears	Reintjes
Radar	Furuno
VHF	Sailor
Autopilot	Radio Zeeland
Bollard pull	30.7 ton
Speed	12.3 knots
Fuel oil	75.7 cu. m.
Fresh water	18.3 cu. m.
Dirty oil	2.0 cu. m.
Lubrication oil	2.0 cu. m.
Sewage	1.8 cu. m.
Sludge	2.3 cu. m.
Foam	5.1 cu. m.
Dispersant	2.7 cu. m.
Water ballast	19.4 cu. m.

second vessel in March 2004. The pair were built from stock hulls with the yard numbers 509805 and 509806. Both vessels will be used for mooring operations, coastal towing and fire fighting operations.

The Damen Stan Tug 2608 has a single chine bilge. The transom corners are well rounded and the vessel has sufficient bow height for severe working conditions. The hull is divided into four compartments and is of a very strong construction with side and bottom plating of 10 mm and decks of 8 mm thickness. The sheerstrake has a plate thickness of 20 mm.

The aft deck is suitable for a specific weight of two tons per square meter and is designed to carry loads up to approximately 20 tons. The superstructure has ample space for a separate galley and mess room.

The accommodation is suitable for a crew of nine, with the captain's cabin and the chief engineer's cabin on the main deck.

Below the main deck, two double crew cabins and a triple crew cabin are arranged. Furthermore a large store is fitted. The complete accommodation and the wheelhouse are air-conditioned.

Two eight-cylinder, resiliently mounted Caterpillar 3508B TA engines power the Damen Stan Tug 2608. The output of each main engine is 820 kW (1,100 bhp) at 1,600 rpm.

Each engine drives a 1900 mm bronze fixed pitch propeller in a NSMB type 37 nozzle for improved astern performances. Each nozzle is provided with a stainless steel inner ring. Reintjes reverse/reduction gearboxes are fitted, type WAF 562L, with a reduction ratio of 5.05:1.

The communication equipment includes a Sailor RT 4822 VHF radiotelephone fitted with integrated DSC modem/ watch receiver, a Furuno FS-2570-25 SSB, with integrated watch receiver and DSC and two Jotron VHF handheld are foreseen. The Navtex is a Furuno NX-500.

The navigation equipment consists of a Furuno radar, type FR-1505 mk III, a Furuno GP-80 GPS navigator and a Furuno GD-1700 chart plotter with echo sounder. The autopilot is of the make Radio Zeeland, type Seapilot 75. The vessels were classified by Lloyd's Register of Shipping.

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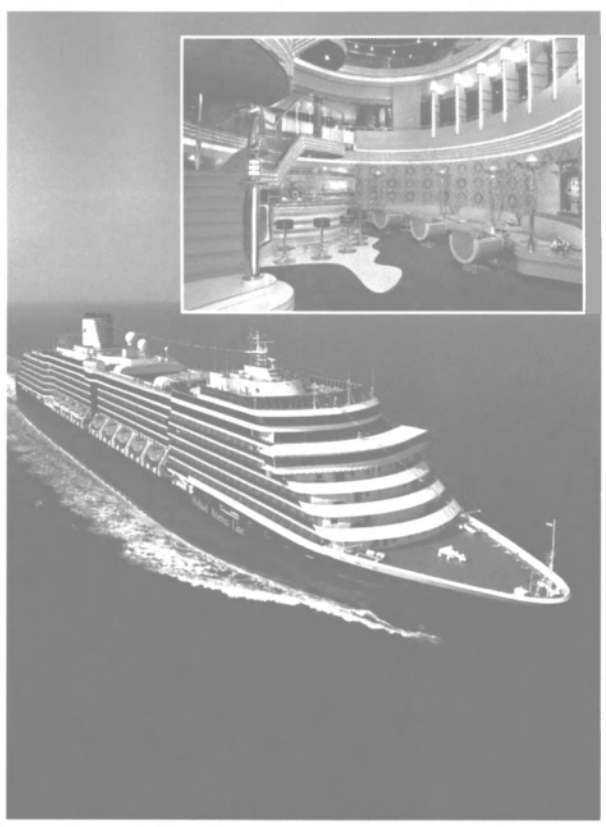

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Circle 51 on Reader Service Card

"From technical expertise to budget and schedule consciousness, Crowley met or exceeded our expectations."

~ Fred H. Van Etten • Project Manager • Chevron Overseas Petroleum

To install five massive energy platforms at Lake Maracaibo, Venezuela, Crowley put its knowledge of complex marine engineering strategies to work. As lead logistics provider for Chevron, we professionally handled all aspects of transportation and installation, adapted new lift technologies and conducted engineering, safety, environmental and budget analyses to meet Chevron's goals.

People who know Crowley know many industries value our logistical know-how. Whether we're solving major installation challenges for energy suppliers, helping to manage supply chains for automotive manufacturers or swiftly moving goods for apparel companies between countries, Crowley has the same goal for every project: exceed customer expectations. For more information, call 1-800-CROWLEY or visit us on the Web at **www.crowley.com.**

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- **Worldwide Logistics**
- **Energy Support**
- **Project Management**
- **Ocean Towing & Transportation**
- **Petroleum & Chemical Transportation**
- **Alaska Fuel Sales & Distribution**
- **Ship Assist & Escort**
- **Salvage & Emergency Response**

CROWLEY®
People Who Know™

Circle 216 on Reader Service Card

Welsh Towing Company Growth Continues

Holyhead Towing has added another boat to its diverse fleet of tugs and workboats. Like most of the vessels in the fleet, the Afon Alaw is named after a river on the Island of Anglesey where the company's home port is located. (Afon is Welsh for river.)

This is the third vessel built for the company by Hepworth Shipyard of Paull, Kingston Upon Hull and will be the most powerful in a fleet that includes multicats, survey boats, fast crew boats and a large split hopper barge. The 83.6 x 29.5-ft. tug has a molded depth of 11.8 ft., which allows a shallow 7.8 ft. working draft, this is important as a major focus of Holyhead Towing's work is dredging and marine civil engineering support in shallow water. The company's work also includes pipelay support and cable work throughout North West Europe and the Caspian Sea.

Afon Alaw's Main Particulars

Owner	Holyhead Towing
Builder	Hepworth Shipyard
Length	83.6 ft. (25.5 m)
Breadth	29.5-ft. (9 m)
Depth	11.8 ft. (3.6 m)
Draft	7.8 ft. (2.8 m)
Crane	Deck mounted 90 t/m Heila HLRM 90/55 hydraulic crane
Main engines	2x Cummins KTA 38M2
Total power	2,600 bhp
Gears	ZF
Top speed	11.5 knots
Bollard pull	35 tons

In addition to conventional towing, the versatile vessel is suitable for anchor handling with a winch capable of 45 tons pull at nine meters per minute and for towing, a capacity of 400 m of 44-mm towing wire. The transom is fitted with a 3.5-m stern roller and hydraulic guide pins. A powered storage reel is in a hold below the after deck. A deck mounted 90 t/m Heila HLRM 90/55 hydraulic crane has a capacity of 29.7 ton at 2.89 m extension and 5.1 ton at 14.47 m. The Afon Alaw's main engines are a pair of Cummins KTA 38M2 engines delivering a total of 2,600 bhp through ZF gearboxes to propellers in fixed Kort nozzles. Giving her a free running speed of about 11.5 knots and a bollard pull of about 35 tons. As with most of the vessels in the fleet Afon Alaw is fitted with box coolers to allow shallow water work. The tug is also fitted with high lift rudders and a bow thruster. Electrical service is met with a pair of Cummins-powered 50 Kva generator sets. Hydraulics are provided for by a Cummin hydraulic power-pack.

The hardwood covered working deck can be fitted with a 30-ton A-frame. A towing hook is also fitted aft of the towing winch. Tankage includes 100-cu.-m. for fuel, 12 cu. m. of domestic water with another 60 cu. m. for ballast or supply water. Fuel and freshwater supply

pumps facilitate support to dredges and other floating equipment.

Circle 44 on Reader Service Card

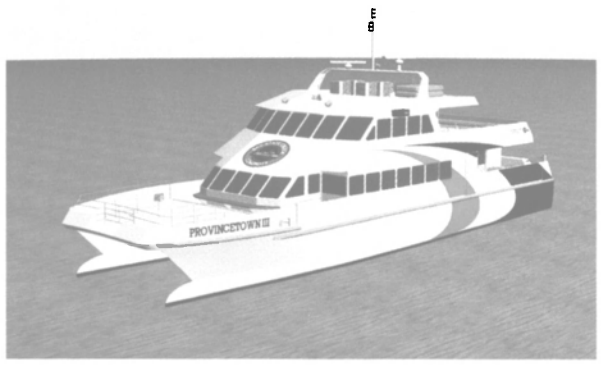
Gladding-Hearn Starts Construction of New Incat Vessel

Bay State Cruise Co. ordered a 149-passenger high-speed ferry from Gladding-Hearn Shipbuilding for service between Boston and Provincetown, Mass., due for delivery in June.

The new, all-aluminum ferry, designed by Incat Designs is 98 ft. (29.8 m) long, 29.5 ft. (9.1 m) at the beam, and draws 6 ft. (1.8 m). It will be powered by a pair of Cummins KTA38M2 diesel engines, each delivering 1,350 bhp at 1,950 rpm. The engines will turn twin Brutons five-blade nickel-aluminum-bronze propellers via ZF2550 reverse-reduction gearboxes. The ferry's top speed is expected to reach 30 knots.

The new catamaran's more modern and rounded bows are Incat's latest development in hull design. The hulls' lower resistance is designed to improve sea-keeping and efficiency and the shape is more suitable to a variety of trims and displacements, said shipyard president **Peter Duclos**. "The Friendship IV's nearly non-stop performance in the past 10 years, from BVI to Florida to Boston, New York City and Bar Harbor, Maine, is respected in the industry. The new boat offers the same simplicity and economy, but with more modern equipment and construction. Structural improvements will save weight and the new hull design will increase the vessel's sea-keeping and fuel efficiency. The conservatively-rated engines provide an economical balance of passenger capacity and speed."

Circle 39 on Reader Service Card



Passenger Vessel Main Particulars

Owner	Bay State Cruise Company
Builder	Gladding-Hearn Shipbuilding
Type	Passenger Vessel
Passengers	149
Design	Incat Designs
Length	98 ft. (29.8 m)
Breadth	29.5 ft. (9.1 m)
Draft	6 ft. (1.8 m)
Main engines	2 x Cummins KTA 38M2
Power	1,350 bhp @ 1,950 rpm (each)
Propellers	Brutons
Gears	ZF
Top Speed	30 knots

Despite 11% Increase, Hempel Disappoints

Despite a new volume record in 2003 and an 11% improvement of net profits before extraordinary items, Hempel's CEO **Ditlev Engel** is not fully satisfied with the result. The major fall in the dollar is the reason that the group was unable to live up to its own expectations for greater progress. Hempel is now to focus even more on a new balanced strategy. Hempel set a new volume record in 2003 with a total paint sales of 191 million liters. But an unexpected fall in the dollar meant that the Group's turnover fell to 536 million euro, a six percent reduction on the year before. However, post tax profits came to 41 million euro before extraordinary items, an 11% improvement. "Despite the fact that Hempel had a good increase in net profits in 2003, I am disappointed that we were so hard hit by the fall in the dollar. The dollar depreciation reduced our top line with 64 million euro and EBIT with 24 million euro. So I am not completely satisfied with our efforts last year. The company's potential is much greater," said Engel. He says that Hempel would have achieved top line growth of four percent if the dollar had maintained its value against the euro in 2003.

Grimaldi-Naples Receives GM Award

Grimaldi Group has been elected General Motors' supplier of the year due to its overall outcome as logistics provider. The award was granted during a ceremony held Saturday April 3, at the Hilton Hotel in Prague. **Bo Andersson**, GM's Worldwide Purchasing Production Control and Logistics Vice President said "Grimaldi- Naples Group represents the type of company with which we want to grow along our journey towards being the best in the world. Grimaldi Group's service level and working method are able to put up with GM's priorities. The company is a model for all of our suppliers," he said.

Group Grimaldi Naples has recently invested more than $1.3 billion in its fleet modernization plan, giving it 50 ships, with an average age of four years. During 2003, Grimaldi Group transported 1.5 billion cars and other rolling units, 400,000 containers and trailers.

Senesco Lands Contract

Senesco Marine signed a contract to build a 100,000-barrel double-hulled liquid fuel barge for Reinauer Transportation. The new barge will be 403.3 ft. long, 74 ft. wide with side depths of 26 ft., 6 in. At 95 percent capacity, the barge will hold 100,000 barrels. The double-hulled barge will add to Reinauer's continuing double-hulled building program to comply with the Oil Pollution Act.

Circle 56 on Reader Service Card

Furuno Supplies 300 AIS Units to Tidewater

Furuno won a contract to supply more than 300 of its FA100 Automatic Identification Systems (AIS) to Tidewater Marine, Inc., the world's largest offshore service company. The FA100 is designed for simplified installations and low cost maintenance. A typical system configuration requires only the Furuno compact MKD, junction box, standard GPS antenna and an AIS-VHF antenna to complete the installation.

Circle 58 on Reader Service Card

Wynn Chosen for Ferry

Austal Ships ordered a complete integrated wiper and control system from Wynn Marine for a new 126m multi-hull cargo/passenger/vehicle ferry, which is currently in production for Spanish operator Fred. Olsen, SA. The system is based on the M80 wiper from Wynn Marine's Coastal Range but will also include a Type C wiper system and a Series 3000 network control system.

Circle 53 on Reader Service Card

Globalstar To Enhance Coverage

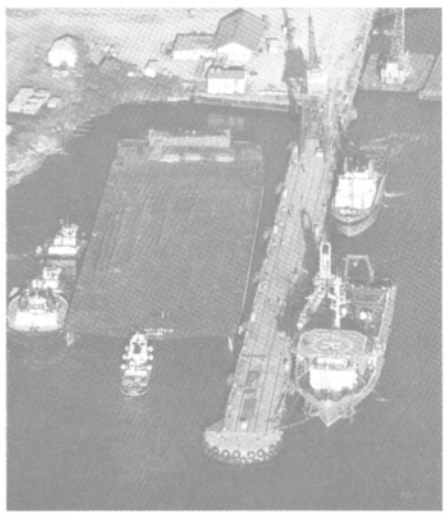
Globalstar has begun engineering and development work aimed at providing enhanced service coverage and system capacity for its customers in the Caribbean and southeastern U.S. regions. When completed, this work should lead to improved call connectivity and reliability, as well as a greater capability to handle anticipated call traffic in this area for years to come.

Circle 55 on Reader Service Card

Royal P&O Nedlloyd Appoints CFO

Following the completion on April 16, 2004 of the listing of Royal P&O Nedlloyd on the Euronext stock market in Amsterdam, the company nominated David Robbie (40) as Chief Financial Officer and a member of the Board of Royal P&O Nedlloyd. It will be proposed that the AGM will appoint Mr Robbie on May 6, with his appointment taking effect from May 10.

Atlantic Marine Expands Rig Repair Capabilities



Atlantic Marine, Inc. has acquired a heavy lift barge, and it is located at its new home on Pinto Island here at the Port of Mobile on the Gulf of Mexico. The barge, dubbed Mobile Heavy Lifter, will expand Atlantic Marine's capabilities allowing it to accommodate offshore rigs, jackups and semisubmersibles that due to size restrictions are currently unable to fit on Atlantic Marine's largest dry dock; the 50,000 ton drydock, Alabama. The heavy lift barge has a length of 393-ft., breadth of 131-ft. with a lifting capacity of 19,000 tons. **Ron J. McAlear**, President of Atlantic Marine, Inc. said, "The addition of the heavy lift barge to our facility in Mobile is part of our ongoing commitment to keep Atlantic Marine -Mobile one of the premier shipyards in the United States. The Mobile Heavy Lifter assures that we are a complete, well-rounded ship and rig repair facility equipped to meet all of our customers repair needs."

Circle 37 on Reader Service Card

AVEVA to Acquire Tribon

AVEVA Group plc, a UK-headquartered engineering software and services group, announced the proposed acquisition of Tribon Solutions AB, a global supplier of IT solutions for shipbuilding and marine design.

Senesco Expands

Senesco Marine hired Norman Hodge as Vice President of new construction. Most recently Hodge was General Manager of Conrad's in Orange, Texas. Prior to working for Conrad's he was the Plant Manager at Halter Marine's Gulfport facility in Mississippi. During that time he was in charge of operations at three shipyards with a total of 500 employees.

Hodge has been directly involved in the construction of over two thousand barges of various types and design over the years. At Senesco Marine, Hodge will oversee the construction of all new barges.

Circle 38 on Reader Service Card

Schlueter Promoted to VP

Crowley Maritime promoted **Ed Schlueter** to vice president of its Vessel Management Services subsidiary. Schlueter will remain in Seattle and

report directly to Tom Crowley Jr., Chairman, President and CEO. Schlueter joined Crowley in 1976 and has held positions of increasing responsibility within the marine engineering field.

Crowley Scholarship Presented

Continuing its support of students wishing to pursue higher education, Crowley Maritime presented Pavian Grinage with a scholarship to assist in his education at the University of Puget Sound in Tacoma, Wash. Grinage is a sophomore in the business school where he is earning a degree in business while pursuing a minor in economics. Crowley began awarding scholarships though Arctic Education Foundation in 2003.

The scholarship was founded to provide financial support to Native Alaskan residents.

Vacon, Rockwell Sign Agreement

An agreement has been reached between Vacon Plc and Rockwell Automation that brings together complementary technologies to improve performance of variable speed drives. The two will design, develop and supply in high-power and high-performance variable speed drives. The parties will design frequency converters that would combine Vacon's experience in electronics and software-controlled frequency converters and Rockwell's experience in drives and automation.

Circle 40 on Reader Service Card

World-Link Discount Plan

World-Link Communications, an Inmarsat service provider, announced an extended Super Quiet time hours plan. Starting April 1, the $0.99 Happy Hour rate will be applicable 12 hours per day on weekday and all weekend long. The new extended hours are 7 p.m. to 7 a.m. weekdays, and all weekend, from 7 p.m. Friday to 7 a.m. Monday.

Circle 7 on Reader Service Card

Panama Canal Implements Vessel Tracking System

Beginning April 1, 2004, and to be fully implemented on July 1, 2004, the Panama Canal Authority (ACP) will begin using a new system to send and receive data to and from vessels planning to transit the Canal. Called the Automated Data Collection System (ADCS), the new system will eliminate the current process of data collection via paper, substituting it with an electronic exchange of information between the ACP and its customers. Vessels transiting the Canal will be required to report all necessary data 96 hours before arrival. To comply with the new security requirements included in the International Ship and Port Facility Security Code (ISPS), the ADCS will improve and facilitate the process of data submission needed for risk assessments and transit operations. The ADCS should save time, lessen human error and reduce delays.

SAM Electronics Books Orders

SAM Electronics has received major orders for supply and installation of shaft generators and associated equipment for generating main engine-driven electrical power aboard a series of newbuildings under construction in leading Korean and Chinese yards on behalf of Hapag Lloyd and Peter Doehle Schiffahrt.

Circle 54 on Reader Service Card

Damen ASD Tug 2411

Damen Stan Tug 3110

Damen Alu Cat 1605

Damen Shoalbuster 2509

Damen Multi Cat 1908

DAMEN

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The ability of long-range, high capacity helicopters to rescue crew from ships in peril - starting with the Sikorsky HH-52A Seaguard in 1962, was a key factor in helping to develop modern "place of refuge" law. Pictured is the Naval Hawk HH-60J Jayhawk basket hoist rescue, complements of Sikorsky, a United Technologies company.

Misplacing the Place of Refuge

On December 30, 2000, the tanker Castor was underway in the western Mediterranean Sea en route from Constanza, Romania to Lagos, Nigeria, carrying 29,470 tons of unleaded gasoline. During a fierce winter storm, the ship developed a 22-m long crack across its main deck between frames 72 and 73, approximately midway along its 183.5 m length. For the next 24 days, the tanker fruitlessly sought permission to enter sheltered coastal waters of nations littoral to the Mediterranean. Its requests were rebuffed successively by Morocco, Spain, Gibraltar, Algeria, Tunisia, France, Italy, Malta, and Greece. Finally, on January 22, 2001, the cargo remaining on board was successfully lightered during a high seas transfer in international waters near Malta.

The concept of force majeure has been broadly accepted since mariners initially encountered the perils of the sea. Persons and governments ashore have been obligated, at least by natural law, to accept and succor those in distress at sea. Concomitant with force majeure is the notion of providing a ship in distress with a place or port of refuge. A place of refuge is where a ship could go to avoid or ameliorate the peril and then depart at the earliest opportunity. While the original need for force majeure and a place of refuge was to reduce the risk to the lives of those on board the ship, the concept naturally extended to the ship itself and any cargo it might be carrying.

Moral and legal support for the place of refuge were lost as a result of two unrelated but nearly contemporaneous events: first, the development and deployment of reliable long-range helicopters for maritime rescue purposes: and second, the grounding of the tanker Torrey Canyon in international waters off the southwest coast of England.

The first modern amphibious helicopter capable of regular rescue operations in the offshore marine environment was the Sikorsky HH-52A Seaguard. This aircraft could cruise at 98 miles per hour, had a range of 474 miles, and could carry ten passengers in addition to a crew of two. This meant that it could transit far offshore and remove a large portion of the crew of a ship in distress without waiting for the ship to get close to the coast. While it was not realized at the time, the deployment of this helicopter starting in 1962 signaled the beginning of the end of the need for ships in distress to come into port or sheltered water in order to save the lives of the crew. Rescue helicopters in use today are even faster, have longer range, and are capable of carrying greater payloads. The concern for safety of the crew, the basic and original rationale for force majeure, has been largely eliminated in the coastal waters of many nations.

Coastal nations of the world suffered a rude awakening on March 18, 1967 when the supertanker Torrey Canyon ran aground in international waters off Lands End, Cornwall. Until then, it was widely believed that they could adequately deal with oil tankers and other ships because the only places that trouble arose as regards coastal nations was in their ports or immediately offshore. Both areas were within the territory of the coastal nation (then generally recognized as the land and all waters within three nautical miles of shore). The coastal nation could exercise its sovereign powers and take appropriate action.

The Torrey Canyon incident, though, occurred more than three miles off the coast of the United Kingdom. Yet, its impact was clearly felt by both the United Kingdom and France. Beaches were closed; fisheries were shut down; and people downwind were advised to stay indoors because of the fumes. After three days of a losing fight to contain the spill and with the tanker starting to break up, Britain did the unthinkable: it called in the Royal Navy and the Royal Air Force to bomb the Torrey Canyon and set its remaining oil on fire. While the world was not outraged by this act of 'war', it was stunned.

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

This incident awakened the world to the new reality that damages that could be inflicted by a modern cargo vessel might far exceed the value of the ship and its freight. This was a major reversal of the days when unscrupulous 'wreckers' might lure unsuspecting ships onto shore so as to loot the cargo. Now ships in trouble risk becoming pariahs.

International law, like other social phenomena, is often developed in reaction to traumatic events. In the aftermath of the Torrey Canyon disaster, as other nations realized that the same catastrophe could strike them, there was broad agreement that the action undertaken unilaterally by Britain should be

codified in the event of future need. An international conference was convened by the Inter-governmental Maritime Consultative Organization (IMCO), a specialized agency of the United Nations. The conference met in Brussels and adopted the International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (Intervention Convention).

The Intervention Convention establishes a regime within which a coastal nation can take action against a foreign vessel on the high seas threatening to pollute its coasts or its waters. While consultation with the flag State of the vessel and other States that might be affected by the casualty is strongly encouraged, such consultation is not required in an emergency. The coastal nation is also encouraged to consult with the owner and operator of the ship, but again this consultation is not required in an emergency.

Under U.S. law, a tanker is not authorized to operate in the navigable waters of the United States if, among other things, it is discharging oil in violation of U.S. law. While the Coast Guard could still allow entry under the concept of force majeure, the burden is on the owner or operator to prove that entry would result in correction of the condition causing the distress. While the owner or operator may assert that entry within twelve nautical miles of the U.S. coast might alleviate the situation, this would be difficult to prove. Further, the availability of long-range rescue helicopters will minimize the peril to the lives of the crew. Thus, a Coast Guard decision to deny the ship permission to enter the navigable waters of the United States will be consistent with federal law.

On December 15, 1976, while en route from Venezuela to Salem, Massachusetts with a cargo of 28,000 tons of crude oil, the tanker Argo Merchant grounded on the Nantucket Shoals, approximately 25 miles southeast of Nantucket Island. The Coast Guard denied a request by the master to dump some of the cargo in an attempt to refloat the ship. Soon thereafter, the tanker broke in two in heavy weather. The Coast Guard sank the bow section utilizing 20 mm cannon fire. The stern section eventually sank on its own. Currents carried almost all the oil out to sea and away from shore. The Coast Guard's actions were consistent with domestic and international law.

In the United Kingdom, broad powers to take action against a ship that presents a threat of pollution to UK waters are vested in the Secretary of State. The Secretary is entitled to give directions for the purpose of preventing oil pollution as respects a ship or its cargo. This authority may be exercised when an accident has occurred to or in a ship, oil from the ship will or may cause significant pollution in the United Kingdom waters or pollution zone, and, in the opinion of the Secretary of State, use of the powers is urgently needed. The Secretary may give directions to the owner, any person in possession, the master, or any salvor. Such directions may require the person to whom they are given to take, or refrain from taking, any action and may require that the ship is to be moved, or is not to be moved, to a specified place; that the ship is not to be moved over a specified route; that any oil or other cargo is to be, or is not to be, unloaded or discharged; and that specified salvage measures are to be, or are not to be, taken. If these powers prove to be inadequate, the Secretary is

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authorized to take additional action to prevent or reduce oil pollution including undertaking operations for the sinking or destruction of the ship and undertaking operations that involve the taking over of control of the ship. These powers may be exercised within the UK territorial waters, UK Exclusive Economic Zone (EEZ), or those waters superadjacent to the UK Continental Shelf.

Legislation similar to that enacted by the United Kingdom is in place in Ireland, Australia, New Zealand, South Africa, Canada, and Malta.

Various efforts have recently commenced to resurrect the "place of refuge".

In the aftermath of several marine casualties off the coast of Europe, the European Parliament and the Council issued a Directive establishing a Community vessel traffic monitoring and information system. Among other things, the Directive provides:

Non-availability of a place of refuge may have serious consequences in the event of an accident at sea. Member States should therefore draw up plans whereby ships in distress may, if the situation so requires, be given refuge in their ports or any other sheltered area in the best conditions possible. Where necessary and feasible, these plans should include the provision of adequate means and facilities for assistance, salvage and pollution response. Ports accommodating a ship in distress should be able to rely on prompt compensation for any costs and damage involved in this operation. The Commission should therefore examine the possibilities for introducing an adequate system of compensation for ports in the Community accommodating a ship in distress and the feasibility of requiring a ship coming to a Community port to be adequately insured.

On December 5, 2003, the IMO Assembly adopted a resolution entitled "Guidelines on Places of Refuge for Ships in Need of Assistance." The resolution includes guidelines for masters or salvors in need of places of refuge and guidelines for actions expected of coastal states. The resolution explicitly recognizes the authority of the coastal state to exercise its authority in taking responsive action appropriate to the threat presented by the ship. Among the factors to be considered by the coastal state are the seaworthiness of the ship; the nature and condition of its cargo; and provisions of financial security. Most significantly, the resolution states:

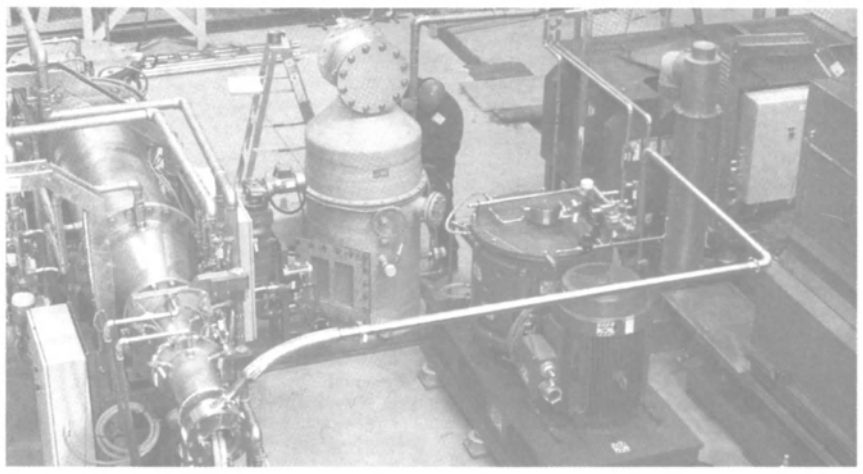
When permission to access a place of refuge is requested, there is no obligation for the coastal State to grant it, but the coastal State should weigh all the factors and risks in a balanced manner and give shelter whenever reasonably possible.

We lost the place of refuge as a result of inattention during the 1960's. When the law of the sea was codified in 1982, the concept was not even mentioned. The value of a place of refuge has belatedly been acknowledged. It is now incumbent upon the maritime community to reinvigorate the concept and get it reincorporated into the law of nations.

We must approach our national governments and seek development of a process for responding to requests by ships in distress for access to a place of refuge. This does not mean that all requests will be granted, but it does (or should) mean that there will be someone to whom such requests will be addressed and there will be a regularized system for considering and acting upon the request. The ship in distress deserves to have its request fairly and rationally considered. The nations of the world owe its mariners nothing less.

Plasma Waste Treatment:

High Tech Taking Less Space

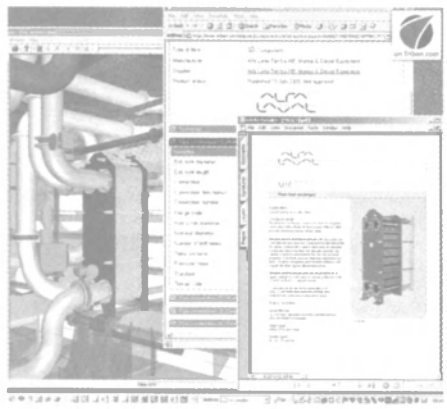


PyroGenisis' Compact Plasma Waste Elimination System is positioned as the most space-conscious solution for onboard ships, and in Miami at Cruise Shipping the company was touting its installation onboard Carnival Cruise Lines M/S Fantasy since October 2003.

The system occupies a surface of only 700 sq. ft. and is located on a single deck of the ship, and is capable of treating a variety of waste generated onboard, including cardboard, food, food contaminated waste (USDA), plastics and cabin waste. Sludge oil can also be treated by the system.

PyroGenesis is in negotiation with Carnival for additional installations. The technology was developed the technology under contract to the US Navy, and is just now making its commercial maritime debut.

Circle 11 on Reader Service Card



A plate heat exchanger from Alfa Laval Tumba AB.

Tribon Offers V8.0

The Internet-based service Tribon.com early last month upgraded with release 8.0. Tribon.com incorporates a Global Database of shipbuilding components and equipment, allowing shipbuilders to access, download and integrate accurate product information directly into their design. Shipyard users can now contact the supplier regarding a particular product, requesting a confirmation of the validity of the data at the time when a download takes place.

Circle 13 on Reader Service Card

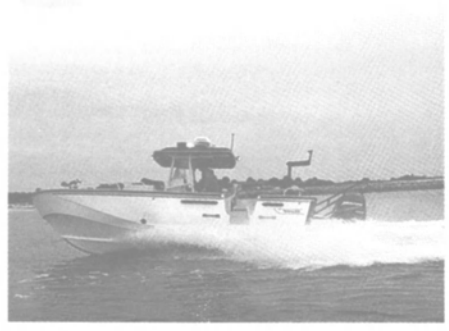
New Estimating System Tracks Repairs

InterPlan Systems offers estimating modules for the eTaskMaker Project Planning System for shipyard/marine inspection and repairs. These new modules are based in part on the estimating data in Don Butler's "Guide to Ship Repair Estimates". Available modules include (partial list): Drydock - Lower Hull Repairs; Propeller Inspection and Repair; Rudder Inspection and Repair; Tailshaft Inspections.

eTaskMaker offers the ability to generate customized project schedules with a minimum of data. Planners need only input quantities and dimensions and answer multiple choice questions to define the scope.

Circle 14 on Reader Service Card

New Firepump Introduced



This unsinkable commercialized Boston Whaler 27-ft. Guardian is equipped with a newly developed Mercury / Darley fire pump. A 200 hp Mercury Optimax Sportjet mated with an engine driven Darley pump to create a fully marinized marine fire pump rated at approximately 1125 gpmM @ 180 PSI. The system includes a 3-in. Stingray monitor and 2.5-in. three-way hydrant wye for hand lines.

Circle 12 on Reader Service Card

New Vent Control System from Delta "T"

The new P/T4 Ventilation Control System from Delta "T" is designed to maintain optimal engine room ventilation. The P/T4 System features a color touch screen for operation with built-in help screens. Greater processing power allows options for damper control and exterior temperature sensing. At main engine startup, the system goes into Auto mode as fan speed responds to variations in both environmental and operating conditions. Intake fans speed up or slow down as air demand within the engine room changes when underway. As the temperature rises, exhaust fans speed up to remove additional heat as needed.

Circle 15 on Reader Service Card

THE ULTIMATE & COMPLETE TREATMENT FOR VIBRATION & NOISE

LO-REZ *SOFT MOUNT*® SYSTEM
for propulsion engines

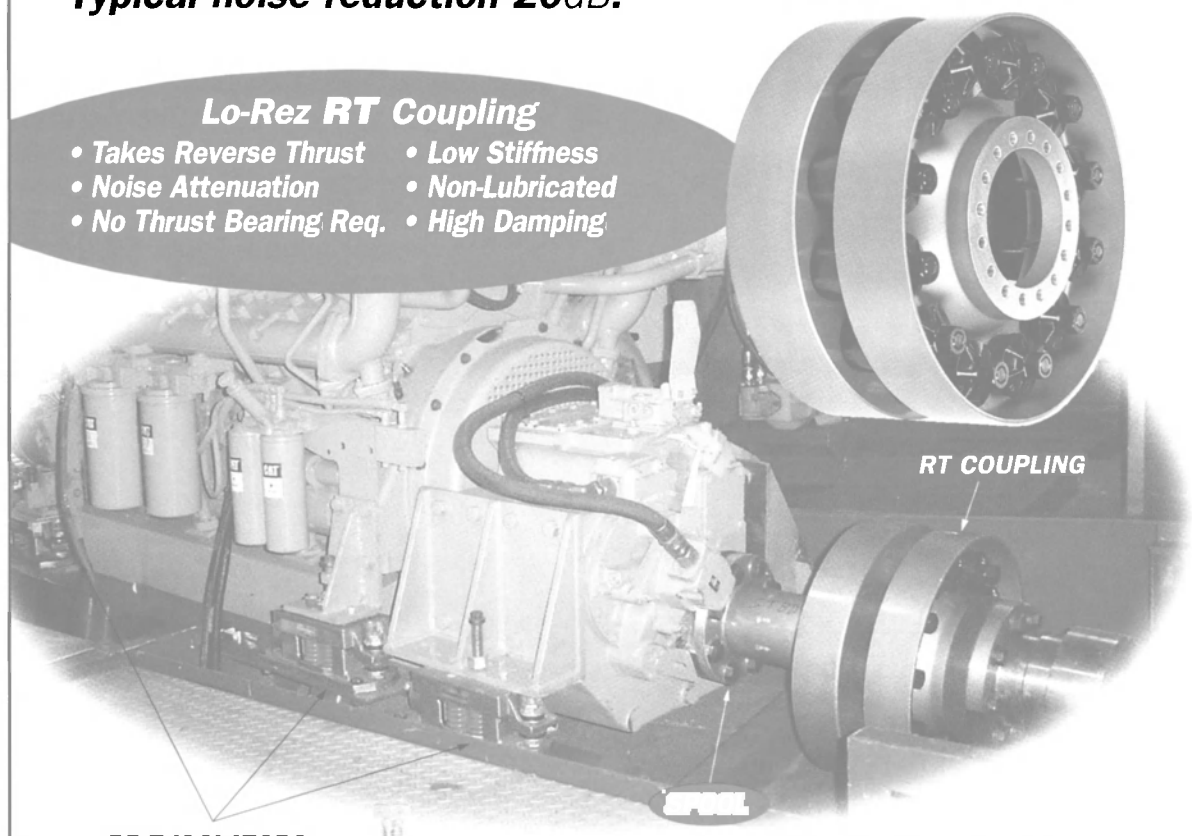
Over 425 propulsion applications in place in all types of vessels.

Typical isolation efficiency 97%.

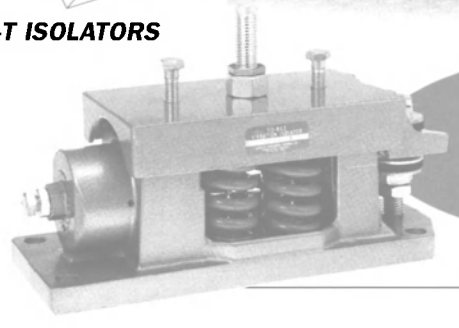
Typical noise reduction 20dB.

Ask us how we can guarantee specific vibration and noise level reductions.

Lo-Rez RT Coupling
- *Takes Reverse Thrust*
- *Noise Attenuation*
- *No Thrust Bearing Req.*
- *Low Stiffness*
- *Non-Lubricated*
- *High Damping*



BR-T ISOLATORS



Lo-Rez BR-T Isolator
- *Carries Full Thrust*
- *Height Adjustment*
- *Isolation Over Speed Range*
- *Damping*
- *Controlled Motion*

Designed & Manufactured By:

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LO-REZ VIBRATION CONTROL LTD.

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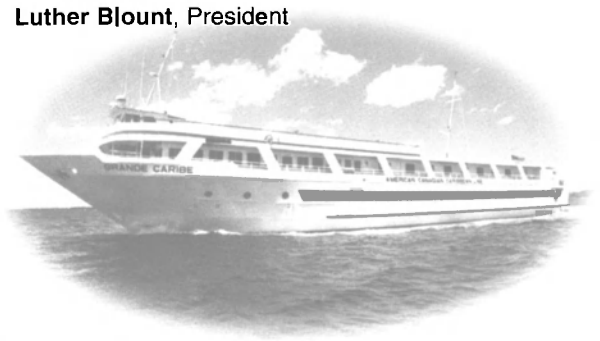
BLOUNT Boat chooses Lo-Rez again for a third super-quiet and super-smooth vessel - Harbour Queen

"For a cruise boat, you have to have a QUIET boat, and with Lo-Rez we have no problem with passenger cabins located directly over the engine room"

Luther Blount, President



GRANDE CARRIBE (Blount)

"The Lo-Rez system allows much easier installation without performing the accuracy of engine alignment"

Robert Pelletier, Senior Designer

GRANDE MARINER (Blount)

M/Y MOSAIQUE (Turquoise Yachts Inc)

SAN FRANCISCO (Marco Shipyard)

"You just won't believe how quiet it is - as quiet as my living room!. At idle rpm you cannot feel the engines running, and can barely tell they are running during acceleration. It is the same in the lounge above the engine room. Our people are extremely happy with the results, as are the San Francisco Bar Pilots"

Bob McMahon, Shipyard General Manager

"During tests, vibration measurements were dispensed with, as no vibration even approaching objectionable levels could be found"

Chuck Cannon, Naval Architect

Schottel Broadens Electric Propulsion Options

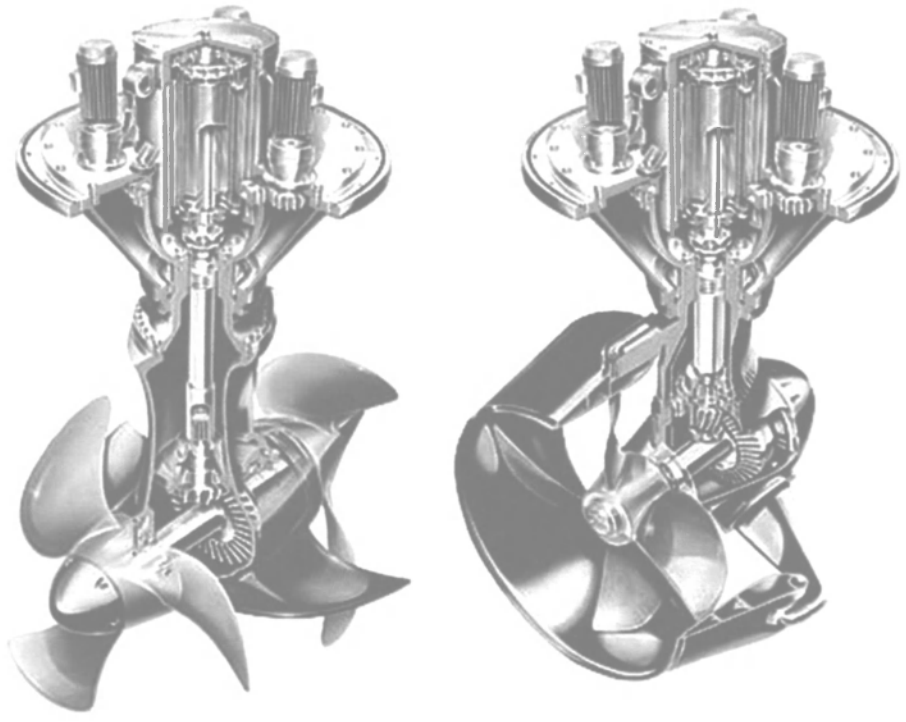
By David Tinsley

German engineers have strengthened the Schottel offering through the development of a propulsor which melds technical design and performance features of the company's proprietary, azimuthing Rudderpropeller series with those of electric podded drives. The resulting hybrid system, known as the Schottel Combi Drive (SCD) and distinguished by its compactness and inboard placement of the integral electric motor, has been designed for unit power applications in the 1,900 to 3,800-kW range.

The innovative new product employs proven mechanical elements from the Rudderpropeller design and the latter's optimized-efficiency, Twin-Propeller (STP) version. It is targeted at offshore supply ships and other special service vessels, along with double-ended ferries, RoPax vessels, small tankers, feeder containerships, and large yachts.

Whereas podded electric propulsors incorporate the drive motor within the underwater pod nacelle, the Combi Drive has been conceived with the electric motor integrated vertically into the support tube of its Rudderpropeller body, so that it lies within the aft hull body. The arrangements provide a response to a market requirement for a 360-degree steerable propulsion unit conferring performance properties akin to those of a pod, but with the electric motor located inside the ship rather than in an underwater appendage.

The position of the electric motor renders the Combi-Drive concept similar to that of a Rudderpropeller with a vertical power input (the so-called 'L system').



Schottel's Combi Drive system, seen in its single, nozzled propeller and twin propeller versions.

Compactness and ease of installation, important attributes from both a ship design and newbuild construction standpoint, are enhanced by the freedom from either an above-water gearbox or a cardan shaft. Schottel believes that the minimum, in-board space requirement of the new system will prove particularly advantageous for support vessels and other applications where available volume at the aft end of the hull is extremely limited. The uptake of diesel-electric power and propulsion solutions in certain quarters of the offshore service sector, not least among Norwegian fleet operators, is expected to stimulate interest in the Combi-Drive design, which is also suited to a range of other vessel types where maneuvering qualities and hull space availability are pressing considerations.

The SCD family, for which the first contracts are being sought, is based on the Rudderpropeller SRP 1515, SRP 2020 and SRP 3030 types, with their proven mechanical components. The new drive system encompasses single, nozzled propeller and twin propeller variants, covering propulsive power delivery needs up to 3,800-kW using propellers from 2,500 to 3,500-mm in diameter. The single propeller type with nozzle, most akin to the standard Rudderpropeller, has been released in 1,900-kW, 2,500-kW and 3,300-kW versions as the SCD 1515, SCD 2020 and SCD 3030 models, respectively. The corresponding twin propeller models, reminiscent of the Schottel Twin Propeller (STP) designs, offer outputs of 2,100-kW, 2,700-kW and 3,800-kW at higher running speeds than the single-screw units. As with the STP series, both propellers in the SCD twin-propeller unit are mounted on one shaft rotating in the same direction. The azimuth steering can be implemented using either hydraulic or electric motors.

Recent examples of electric drive applied to proven Schottel propulsion systems include the installations nominated for a series of four diminutive gas carriers ordered from the De Poli shipyard in Venice-Pellestrina by Italian interests. Each 1,900-dwt newbuild, embodying a cargo volume of some 3,000-cu. m., has been specified with two STP 1010 L-drive Twin Propeller units, using two relatively small propellers of 2,150-millimetre diameter in each unit. The extremely compact installation relies on power delivery to each STP by an electric motor with direct vertical coupling, yielding 1,050-kW apiece at 720-rpm, giving a contract speed of 13.5-knots.

Space-saving, efficiency and maneuverability characteristics had a signal bearing on the choice of STPs with electric drive for the Italian gas tankers, contracted for Mediterranean operations with Stargas. Model vessel tank tests had indicated that performance with the

chosen system would be equal to that with similar propulsion units incorporating a single 2,538-mm diameter propeller in each case. The STP Twin Propeller solution therefore obviated the need for an 18-percent larger single propeller, and making it possible for cargo-carrying volume to be increased.

Schottel equipment with electric drive was also incorporated in a 94-m ice-breaking supply ship delivered for duties in the shallow waters of the northern Caspian Sea. Built in Norway by Ulstein Verft for BUE Marine of the UK, the vessel is fitted with two pulling-type Rudderpropellers powered by frequency-controlled electric motors. Schottel propulsors have also been specified for the first diesel-electric offshore supply ships ordered to date for Chinese owners. Diesel-electric propulsion has been selected so far for two in a series of eight 69-m newbuilds entrusted to two Chinese yards.

Meanwhile, the German propulsion specialist is chasing fresh business for the Siemens-Schottel Propulsor (SSP) pod series and the in-house developed, smaller Schottel Electric Propulsor (SEP) system, which is due to make its seagoing debut in August 2004. The first operational reference for the SEP will be provided by the German Water Board's 69-m multipurpose newbuild Stephan Jantzen, installed with two such pods of 1,850-kW apiece. Conceived for oil spill attendance, coastguard and rescue duties in the Baltic, the icebreaking, multi-role vessel is under construction by Peene-Werft at Wolgast, in the eastern part of Germany. The two other contracts to date for the SEP system have arisen from the newbuild project for the 94-m ice-fringe research ship Maria S. Merian, and the Royal Dutch Navy's amphibious transport vessel Johan de Wit.

The expansion of the traditional Schottel range in recent years to include large, electric propulsion systems and other equipment was preceded by the takeover of Wismar Propeller- und Maschinenbau (WPM), and DM20 million expenditure on the modernization and expansion of production capacity at the Wismar site. The investment has been vindicated, since it has allowed Schottel to penetrate new areas of the market while reinforcing its position in established sectors. The purchase of WPM, integrated into the group as Schottel-Schiffsmachinen, was motivated by the group's development of its product range, and by the space constraints of Schottel's Spay premises on the Rhine.

The all-undercover Wismar plant, which features two 150-ton gantry cranes, has a considerably greater unit lifting and handling capability than Spay, and high productivity. The facilities include three large assembly pits, an indoor basin for test runs, and a new, Skoda multipurpose machining station. The flexible workstation can produce a shaft in one job, the single machine undertaking all turning, boring, gearing and milling. Wismar had concentrated on controllable pitch propeller systems and rudders in the days of WPM, and is now also the production point for Schottel's largest Rudderpropellers. While Spay retains a manufacturing role, complemented by its pivotal design function, the group's wholly-owned Chinese subsidiary at Suzhou has assumed production responsibility for the smallest Rudderpropellers and transverse thrusters, plus components for larger systems, serving both the Chinese market and export destinations.

Circle 48 on Reader Service Card

CIMAC Congress Set for Kyoto

One of the world's premier technical events leading the discussion of combustion engine technology across the industrial board is the CIMAC World Congress, which is set to convene at its 24th event in Kyoto, Japan, from June 7 to 11.

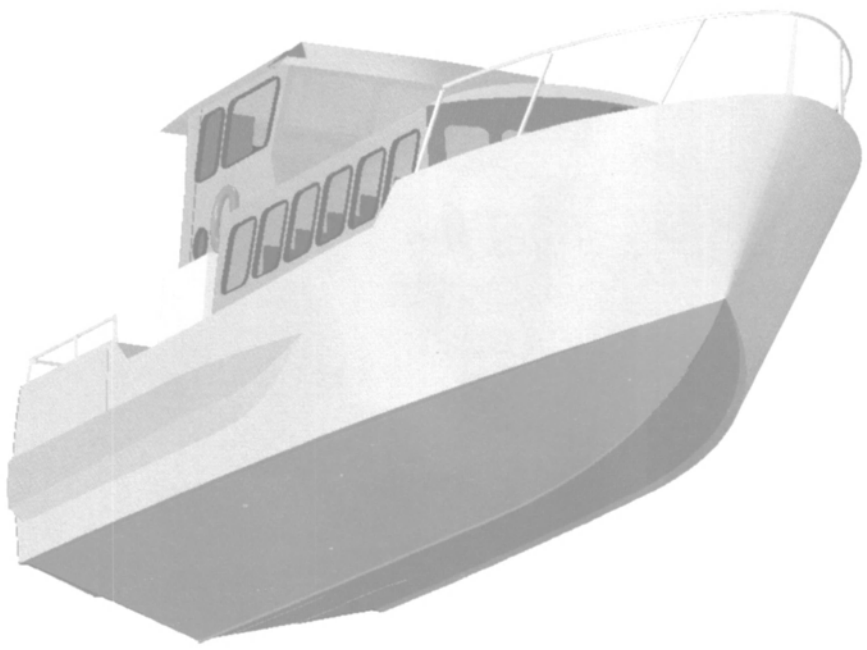
The CIMAC Congress - founded in 1951 and is the French acronym for International Council on Combustion Engines - takes place every 2 to 3 years, bringing together manufacturers of diesel engines, gas engines and gas turbines, users such as shipowners, utilities and rail operators, and suppliers, oil companies, classification societies and scientists from all over the world, to encourage the exchange of scientific and technical information and to promote a higher level of understanding among the combustion engine community. It is a non-profit association acting worldwide.

The technical program of the forthcoming CIMAC Congress includes 185 papers from 23 countries in 44 sessions. Panel sessions on 'Users view and expectation on the future of ICE' as well as 'Gas turbine future Aspects' will be held on Wednesday afternoon, June 9. The traditional 'Collin Trust Lecture', followed by a panel session on 'Environmentally and human friendly ICE' on Thursday afternoon, June 10, will round off the technical sessions at this year's CIMAC Congress.

This year, ASME-ICED members are also being asked to participate in the CIMAC Congress being held in June 2004 in Kyoto, Japan. For the first time ASME-ICED is organizing four sessions at the congress, which will take the place of their usual spring conference. More than 600 top-level participants from all over the world are expected to attend this congress. As at previous CIMAC Congresses, there will be an attractive social program in the evenings and a daytime program with optional tours for accompanying persons. Optional Post Congress tours with interesting visits and insights into Japanese industry are offered for Friday, June 11.

For more information visit www.cimac.com

Waterjets for a Difficult Design Task



The idea of a ferry going over the sea to Skye (see ferry route on map, upper portion of next page) is not a new one, though a challenge in terms of efficiency and comfort to say the least. Upon investigation, it was found that a waterjet propulsion solution was the only viable option.

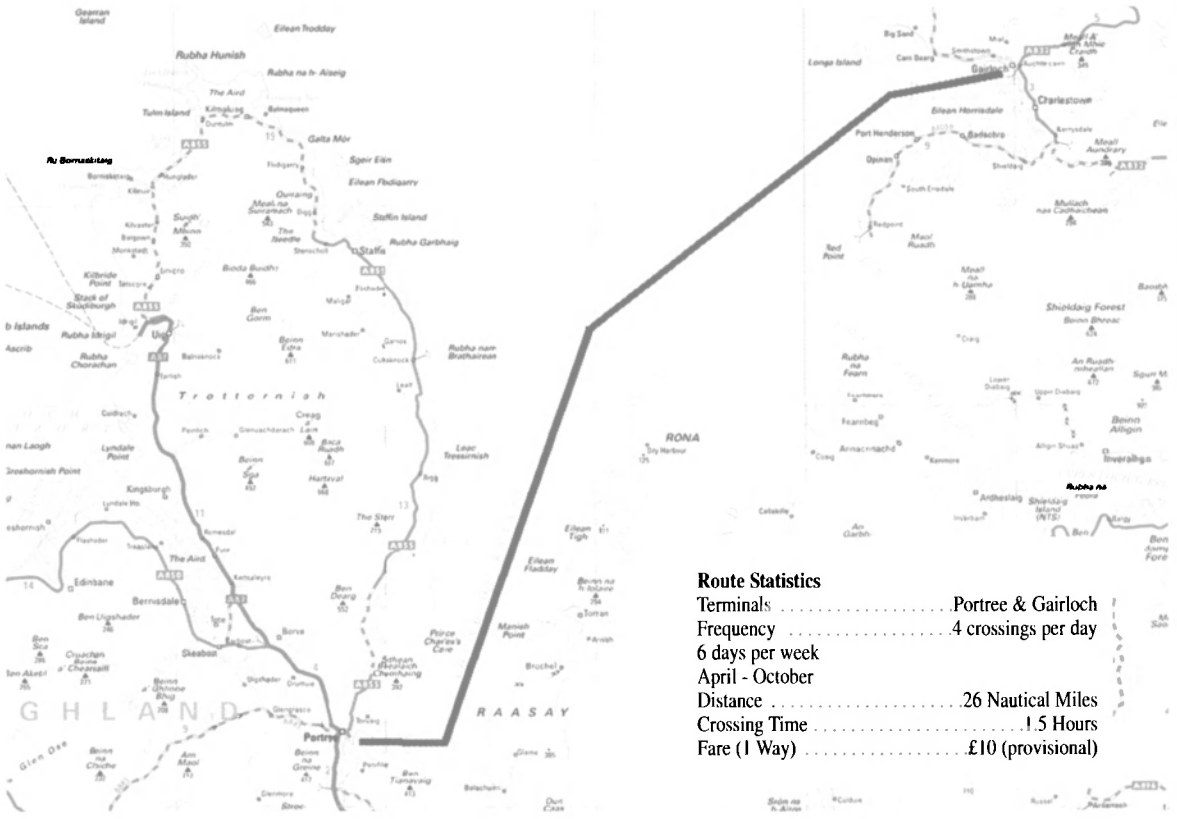
The idea of a ferry going over the sea to Skye is not a new one, although with the Skye bridge opening a few years ago, it is not an adventure many people undertake these days. A small car ferry operates in the south of the island, and a large car ferry takes people over from Uig in the north west corner of Skye to the Outer Hebridian islands of Lewis and Barra. There had however, long been talk of a possible passenger service linking the North of Skye to the Scottish mainland at Gairloch. A feasibility study was carried out by the local council, after which some local businessmen pulled together to form a new company in 2003 called West Highland Seaways Ltd., trading as 6° West.

The requirement to make the route successful was that the journey must be done four times per day, in an hour and a half, requiring an average speed of 18 knots. The journey must be comfortable, but in a craft that could handle the rough sea conditions. While existing designs were offered with modifications to meet the new EU regulations on the safety of Passenger Vessels, they tended to be relatively heavy displacement vessels, which required excessive power and fuel consumption to achieve the 18 knots required.

Ace Marine were approached, and responded with a new concept in boat design that was designed to be low cost, lightweight and comfortable, with reconditioned airline seats. The designer molded a relatively narrow hard chine planing hull form around six rows of seats with the intention of delivering excellent sea keeping qualities, both at speed, and at loitering speeds.

The client specified a pair of Cummins engines for redundancy. The 26-in. diameter propellers required to push the vessel at 18-20 knots meant long shafts with brackets, and exposed rudders. In order to protect the propellers and rudders for beaching purposes, the designer

Vessel Specification	
Length	48.4 ft. (14.8 m)
Beam	13.1 ft. (4 m)
Draft	2 ft. (0.6 m)
Displacement	12.5 tons
People (summer)	36 Passengers + 2 Crew
Cargo (winter)	1 on or 12 Passengers + 2 Crew
Speed	18 Knots Cruising
Engines	2 x Cummins 6BTA5.9M
Certification	EU Class C & MCA Workboat CoP



Route Statistics

Terminals	Portree & Gairloch
Frequency	4 crossings per day
6 days per week	
April - October	
Distance	26 Nautical Miles
Crossing Time	1.5 Hours
Fare (1 Way)	£10 (provisional)

added a long and deep sloping keel. The whole effect was unsatisfactory. Waterjets were investigated and the initial findings were not encouraging. They appeared expensive and inefficient below 25 knots. However, the designer found Ultrajet units, which met price and performance requirements.

The vessel was designed in 3-D using Maxsurf Pro from formation design, with hydrostatics, damage stability, and one compartment flooding checked with Hydromax Pro. All plates were defined without recourse to complex curvature, and developed using Workshop.

The dxf plate outlines were then sent to the yard, where they were nested and then cut using their CNC plasma cutter. The vessel was being built at Sandy Morrison Engineering in Uig, Isle of Skye, was scheduled for delivery this month.

Circle 22 on Reader Service Card

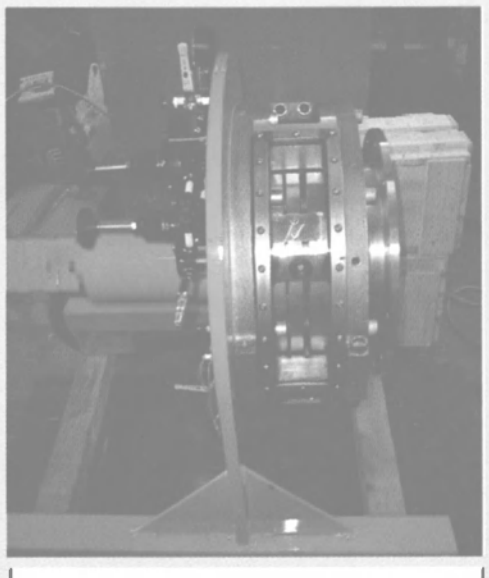
New Shaft Seal from Ocean Venture Seals

Venture Seals (OVS), a manufacturer of propeller shaft sealing systems, has developed the Eco-Seal - what it describes as a revolutionary new design in propeller shaft sealing technology, as it is designed to ensure there is no oil leakage to the environment from the propeller shaft and no contamination of the sterntube oil by sea water. Any small leakages of oil or water are contained in the Eco-Seal's casing and drained inboard, with any leaked fluids being handled as bilge water.

Colin Drew, OVS sales and marketing director, says: "As well as providing commercial and environmental gains for shipowners, the Eco-Seal's green design puts to rest the image of vessels polluting the environment with a thin line of oil following the ship everywhere it sails. With the spotlight of ever tightening environmental legislation regularly being aimed at shipping, shipowners are becoming increasingly aware of the benefits of keeping legislators on-side."

Eco-Seal has a fully split construction which allows repair and maintenance activities to be carried out with the propeller and propeller shaft remaining in place. In many cases the seal can be repaired underwater. This eliminates the need for any towing and drydocking expenses, which are always a large proportion of any repair bill. It also means that the vessel can be repaired on site in the water.

Circle 64 on Reader Service Card



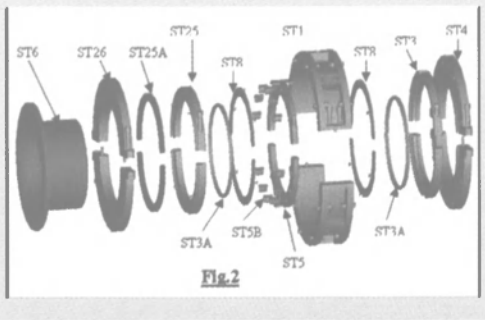
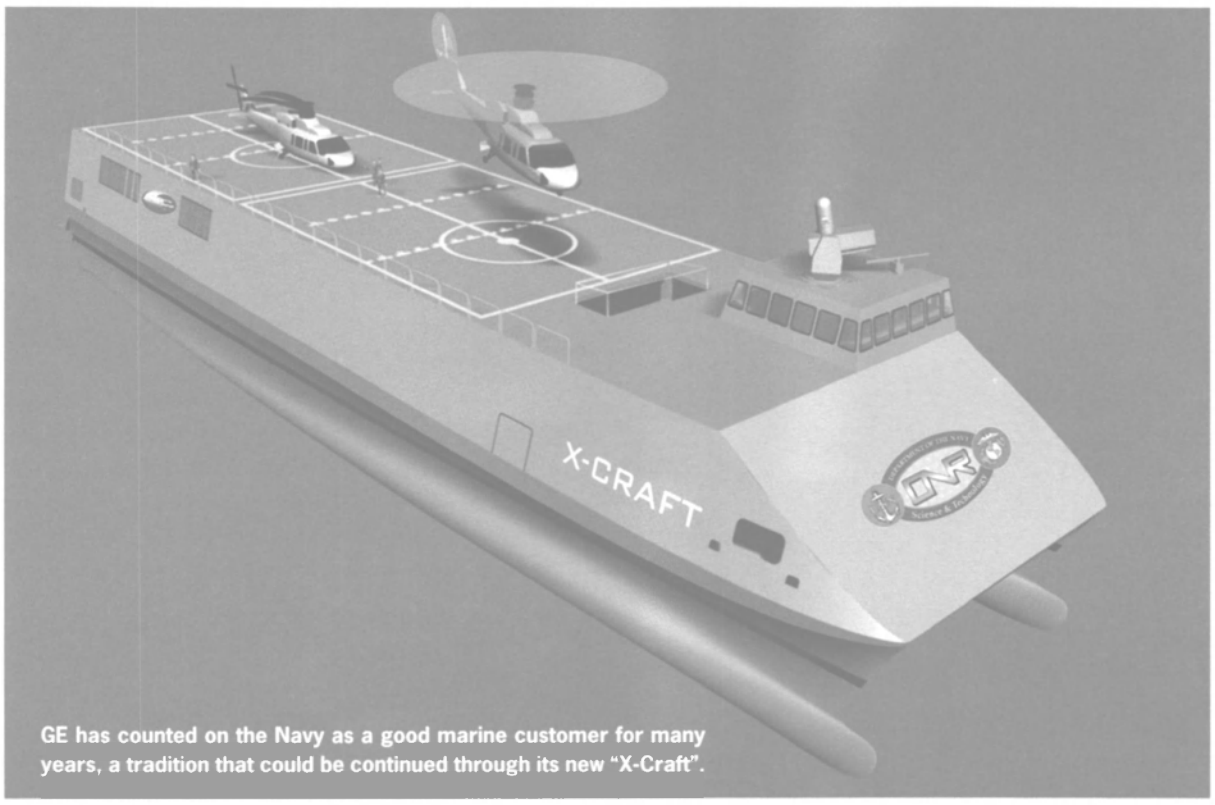


Fig.2

Gas Turbines: Keeping Fresh With Innovation



GE has counted on the Navy as a good marine customer for many years, a tradition that could be continued through its new "X-Craft".

Keeping pace with the fast-evolving maritime industry is a mantra at GE Marine with its LM aeroderivative gas turbine line. Going forward, GE Marine will see its LM gas turbines applied in several novel and state-of-the-art military and commercial marine projects. One military application in particular — the Office of Naval Research's (ONR) new X-Craft (pictured left) high-speed catamaran — will use two LM2500 in a COmbined Diesel Or Gas turbine (CODOG) configuration with two MTU 16V 595 TE90 diesel engines with a corresponding gearbox and four waterjets. The propulsion system will enable the vessel to reach speeds of 50 knots. According to GE, the X-Craft will set the stage for the U.S. Navy's next generation of warship, the Littoral Combat Ship. ONR's state-of-the-art X-Craft will also be used for the purpose of hydrodynamic experimentation. Counting the U.S. Navy as a good customer is an understatement, as GE has delivered a total of 590 (not including spare engines) LM2500 gas turbines to the U.S. Navy for a variety of combatant programs. Presently there are more than 1,900 LM2500 gas turbines operating worldwide, logging over 40 million hours in service.

Cruise Projects

On the commercial marine front, GE is witnessing the natural progression from installation, design and commissioning of GE gas turbines aboard cruise ships to cooperation with users to further enhance operations. Celebrity Cruises' Millennium, the first cruise ship to use gas turbines, made its maiden voyage in July 2000 powered by two GE LM2500+ gas turbine-generator sets in a COmbined Gas turbine and steam turbine integrated Electric drive System (COGES) configuration. This system fulfills all propulsion and onboard power requirements for this 1,950-passenger vessel. Since that time, an additional three Royal Caribbean International and three Celebrity Cruises ships, respectively — Radiance of the Seas, Brilliance of the Seas, Serenade of the Seas, Infinity, Summit and Constellation — have been operating using the same COGES arrangement.

Through a comprehensive program with Royal Caribbean International and Celebrity Cruises, GE has moved from the newbuild phase to operational optimization of the reliability and maintainability of these gas turbines and their packages.

GE monitored various components of the gas turbine packages over a 16-month period (August 2002 through November 2003) to plot fleet reliability data. Fourteen gas turbine-generator sets that had accumulated a total of approximately 91,000 operating hours were monitored.

In other cruise industry-related news, the Queen Mary 2 — the world's largest transatlantic liner — made its maiden voyage in mid-January 2004 powered by two GE LM2500+ gas turbine gensets in a COmbined Diesel And Gas (CODAG) propulsion system with four diesel generator-sets. The LM2500+s enable the ship to meet its maximum speed of 30 knots. Each gas turbine-generator set contributes 25 MW to the ship's overall 118 MW of installed power.

Circle 6 on Reader Service Card

MAN B&W Diesel Debuts the New S65ME-C

MAN B&W Diesel designed a tailor-made S65ME-C engine for the latest design of Capesize modern bulk carriers. The engine was designed to respond to present and future bulk carrier needs, and it will fit into Suezmax tankers, as well.

"We examined the market and received advice from Universal Shipbuilding Corporation in Japan, that there is an increasing need for more dedicated engines for the specialized requirements of more and more refined ship designs," said **Ole Grøne**, two-stroke Vice President, Sales and Marketing, MAN B&W Diesel A/S. MAN B&W is positioning the S65ME-C as the solution for owners and operators of modern large bulk carriers and Suezmax tankers, as well as large twinengine dieselized LNG carriers. The engine presents a 7-cylinder alternative to the 6S70MC and 6S70MC-C/ME-C engines. The reference list for the ME engine range now comprises 75 engines in nearly all available engine sizes, and service experience continues to be excellent.

Circle 21 on Reader Service Card

7S65ME-C Engine Data	
Bore (mm)	650
Stroke (mm)	2730
RPM	92
MEP (bar)	18.5
Power/cyl (kW)	2,570
Power (kW)	17,990
SFOC (g/kWh)	167

Thordon COMPAC Finds Success in FSV

To ensure that fish populations could be studied effectively, Oscar Dyson, a new Fisheries Survey Vessel (FSV) built for the NOAA was recently delivered featuring many advanced noise suppression technologies, including Thordon COMPAC Water Lubricated Propeller Shaft Bearings.

Built by VT Halter Marine Oscar Dyson is designed to play a vital role in maintaining the health of the northern Pacific fishing industry. The ship will use a variety of techniques — including hydroaccoustic surveying — to collect the essential data required to establish accurate quotas. A ship measuring 210 x 49 x 28 ft. (64 x 15 x 8.5m) would normally generate enough background noise to hinder surveying ops. Therefore, achieving a low acoustic signature was a critical design parameter right from the start. According to the vessel specifications, the stern tube bearing needed to be "of environmentally safe and acoustically inefficient materials."

In addition to being acoustically stealthy, Oscar Dyson is also equipped with DPS. The DP coordinates the thrusters and main shaft to effect the station keeping duty and hold the vessel in one position. Starts, stops and low shaft speeds are necessary to maintain the vessel at a precise geographical coordinate. When a ship operates in this manner, shaft squeal is the noise generated when the shaft is operated at slow speeds and is literally trying to stick to

the bearing. Noise will radiate from the vessel into the water. COMPAC's inherent self-lubricating properties and hydrodynamic design are designed to keeps breakaway friction low which helps to eliminate stick slip effects.

Circle 36 on Reader Service Card

Wärtsilä to Power Australian FPSO

Wartsila won a contract to supply a 31.5 MW diesel power plant for a floating production, storage and offloading (FPSO) vessel for the Mutineer-Exeter field of Santos Ltd. off the north west coast of Australia. The plant has been ordered by MODEC Inc. of Tokyo.

MODEC is converting an existing Suezmax tanker, of about 150,000 dwt, into a turret-moored FPSO vessel for Santos Ltd. of Australia. It will be operated by MODEC on the Mutineer-Exeter field (WA-191-P), and will have a storage capacity for 930,000 barrels of crude oil and will be moored in 156 m water depth. The turret mooring will allow the vessel to be disconnected easily when a cyclone approaches so that it can temporarily leave the field. The vessel will be capable of processing 100,000 barrels of crude oil a day, and can treat 125,000 barrels a day of produced water. The first oil from the field is planned for mid 2005.

Wärtsilä Engines for Russian Icebreaker

Wartsilä won an order for four engines for installation on the first Sakhalin ice breaker to be built by the Kvaerner Masa-Yards shipyard in Finland. The vessel will be equipped with three 8-cylinder Wartsila 38 main engines in diesel electric drive and an additional 6-cylinder Wartsila 20 engine to power a harbor/emergency generating set. Kvaerner Masa-Yards has been commissioned to design and build the icebreaker by the Russian Far-Eastern Shipping Company PLC (FESCO). Headquartered in Vladivostok, FESCO is the largest shipping company in Eastern Russia. Its strategy is to be the leading operator of icebreakers and ice class vessels in East Asia.

Scheduled for delivery to FESCO in 2005, the 4,000 dwt vessel will be 100 m long and have a shaft output of 13 MW. The Wartsila 38 engines will each have an output of 5,800 kW at 600 rpm and the Wartsila 20 engine will have an output of 1,080 kW at 1,000 rpm. The engines are scheduled for delivery to Kvaerner Masa-Yards during autumn 2004.

Circle 42 on Reader Service Card

Parker 721 Hose for Tight Spaces

The 721 hose from Parker Hannifin Corporation's Hose Products Division is designed to provide superior flexibility for high-pressure applications. Parker's 721 hose meets SAE 100R12, ISO 3862-1 and EN 856 Type R12 specifications. Because of its one-half SAE 100R12 minimum bend radius, users can expect easy installation in tight spaces and less hose used. Parker 721 hose has a 4000 psi working pressure in sizes 3/8-in. ID through 1-in. ID; 3000 psi in the 1.25-in. ID; and 2500 psi in the 1.5-in. and 2-in. ID. This flexible performer can handle a variety of petroleum base hydraulic fluids and lubricating oils, water/oil emulsion and water/glycol hydraulic fluids.

Circle 17 on Reader Service Card

VSP: Same Power, 9% More Bollard Pull

With the commissioning of the Norway's Bukser og Berging Voith Water Tractor Baut, the improved characteristics of the new Voith Schneider Propeller (VSP) blades were demonstrated. The bollard pull — as supervised by DNV — was improved by nine percent while using the same input power.

The VSP is designed to provide accurate, stepless and extremely swift thrust variations in accordance with XY coordinates. In order to improve the hydrodynamic characteristics of the VSP further, a new generation of blades has been developed. The basis for the successful development is the numeric simulation of the fluid dynamics (CFD = Computational Fluid Dynamics). The CFD method initially serves to optimize the shape of the propeller blade; it also provides the exact loads for the structural and mechanical optimization by using the Finite Element Method (FEM).

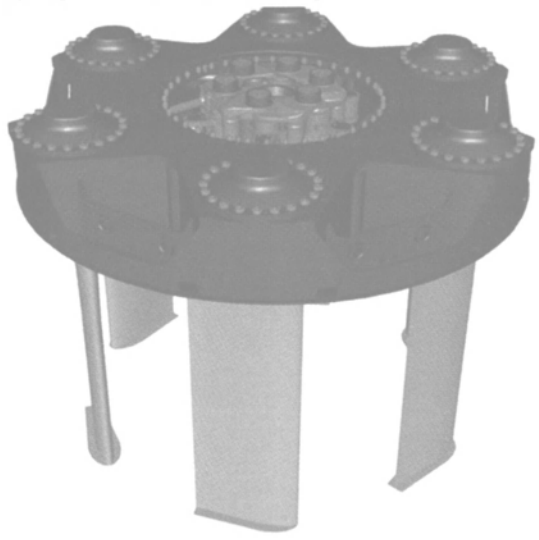
The new VSP blades for the propeller size 36R6/255-2 represent an important step towards the further improvement of the hydromechanics of Voith Schneider Propellers.

For new propellers, the new profiles will be standard; any further improvements can be realized with immediate effect. Voith, founded in 1867, has a long history in the marine propulsion field. With 24,000 employees and annual sales of about $3 billion, it is one of the largest of Europe's family-owned companies.

Circle 1 on Reader Service Card

Below: A CAD illustration of the new VSP size 36R6/255-2 with a propeller input power of 3380kW.

Top Right: Blade after machining.



The New MTU 2000 CR Marine Engines

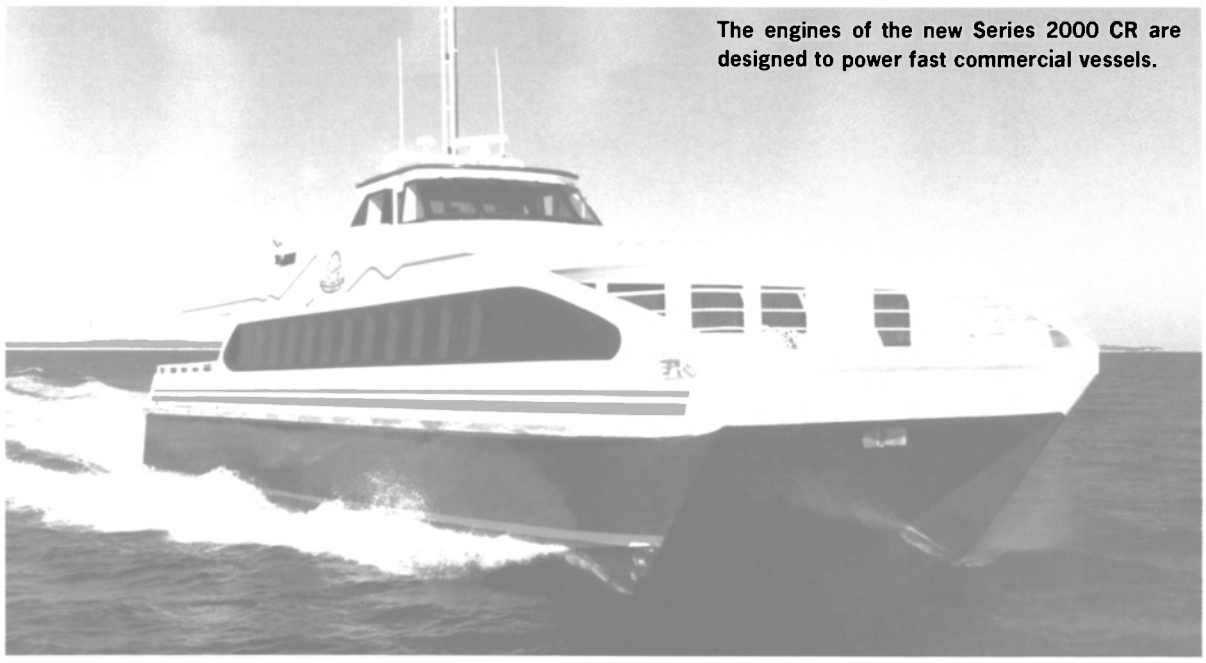
The continuing advancement of the diesel engine propulsion package for the maritime environment follow a common track, ie. higher power with lower weight; increasingly sophisticated and reliable electronic controls; more efficient handling of emission reductions; and ease of maintenance.

While achievement of these objectives vary by manufacturer, as any vessel owner can attest, MTU continues to deliver technological leaps and bounds that are similarly practical.

The new MTU 2000 CR (common rail) marine engines are designed to be smaller, lighter, cleaner, more powerful and more economical than their predecessors, the 2000 series. Improvements to the key technologies of turbocharging, injection and electronics have been redeveloped and advanced.

The 2000 CR engines are designed to deliver a favorable power-to-weight ratio (1.99 kg/kW - 1.48 kg/hp). The 2000 CR engines have only one exhaust gas outlet instead of two, therefore, only one exhaust gas duct is needed, which saves weight and space in the engine room.

Features including an increased power per cylinder and the extensive use of light alloy contribute to the good power-to-weight ratio. The weight optimization of components and the modular design of the engine are also important factors. In several places in the 2000 CR engines, more than one function is integrated into the same component, helping to save weight and space.



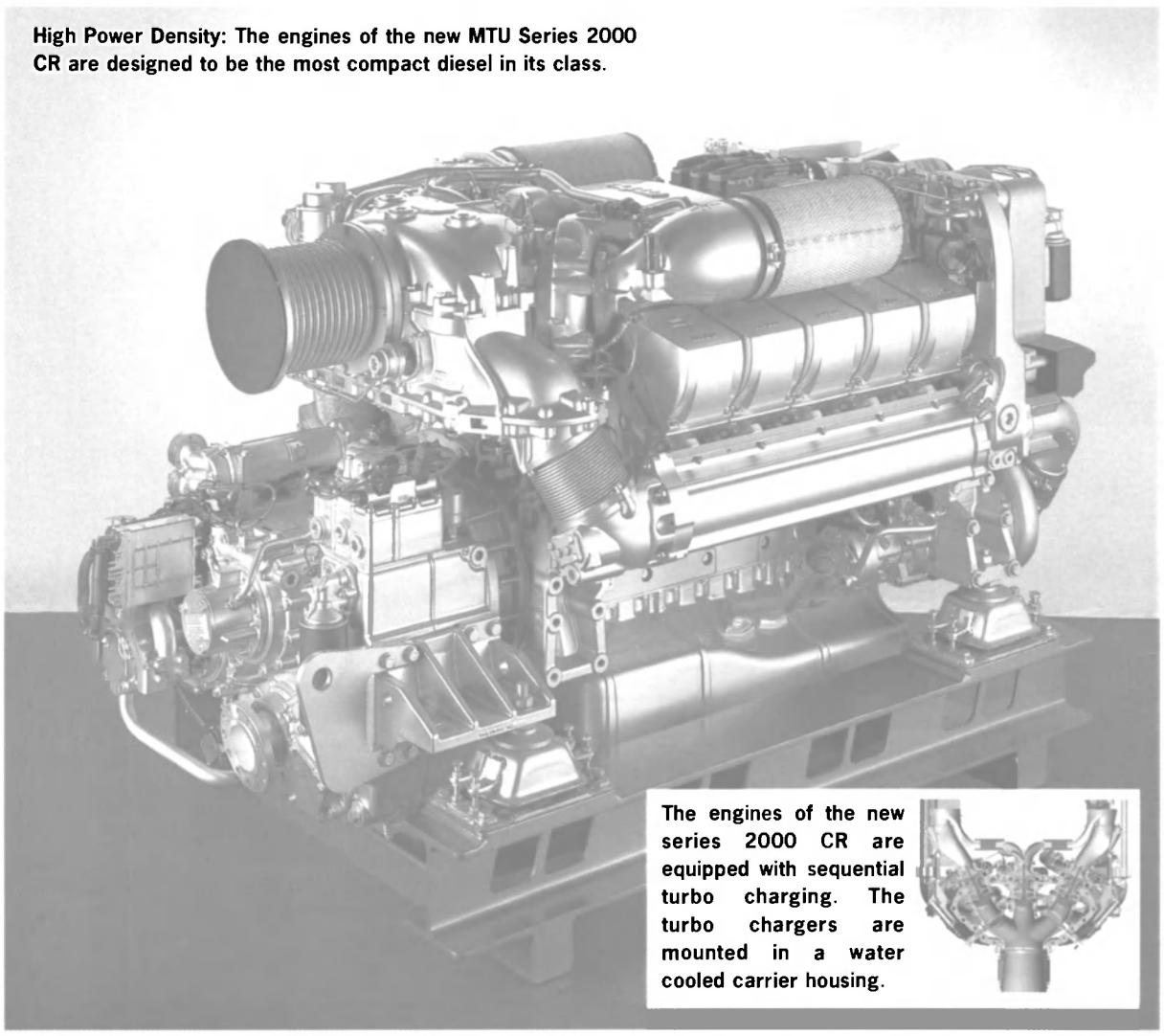
The engines of the new Series 2000 CR are designed to power fast commercial vessels.

An example: the engine Vee, which together with the outer wall of the charge air cooler situated above it forms the ducting for the charge air flow, which goes from the turbochargers to the charge air cooler. Such a design was possible because a common rail injection system is used, and the space in the engine Vee (90 degrees) is therefore not occupied by injection pumps.

As a result of the cleared engine Vee, the crankcase was also redesigned. For example, the water feed and return channels arranged in the V angle were designed as box-shaped components that reinforce the cylinder walls and support the banks against each other. This, according to the manufacturer, is designed to stabilize the cylinder banks and reduce cylinder liner deformation, and therefore piston ring and cylinder liner wear.

MTU has been using the common rail injection system since 1996, and as a result of an overall positive experience, the engine maker has again used a com-

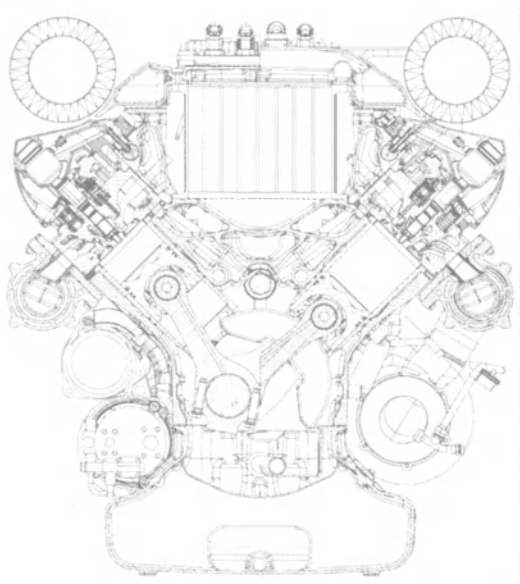
High Power Density: The engines of the new MTU Series 2000 CR are designed to be the most compact diesel in its class.



The engines of the new series 2000 CR are equipped with sequential turbo charging. The turbo chargers are mounted in a water cooled carrier housing.

Technical Data of the New 2000 CR Engines

Number of cylinders	8, 10, 12 and 16
Engine output for yachts and fast ships	895, 1120, 1344, 1792 kW/ 1200, 1500, 1800, 2400 hp
Power per cylinder	112 kW/150 hp
V angle	90 degrees
Bore/stroke	135 mm/156 mm
Displacement per cylinder	2.23 liters
Idling speed	600 rpm
Maximum engine speed	2450 rpm
Turbocharging	Single-stage sequential turbocharging with two or three turbochargers, charge air cooling, water-cooled compressor wheels
Injection	Common rail with individual storage volumes integrated into the injectors
Cooling system	Mixed circuit
Valve control	Four valve design with a centrally arranged camshaft
Cylinder cut-out system	Optional, electronically controlled



mon rail system in the 2000 CR, but with a twist. It is an advanced version, in which an accumulator is mounted on top of the injectors.

The actual storage function is therefore no longer performed, as previously, by the common rail, but by individual storage facilities in the cylinder heads. This is designed to prevent pressure fluctuations in the fuel line, helping to stop surging at the injectors and the supply of too little or too much fuel. The pressure (max. 1800 bar) remains virtually constant in the entire system. In addition, the fuel lines have a smaller and, in the standard version, single-wall design. The fuel line is situated inside the charge air pipe, and is thus surrounded by a second layer.

The common rail system of the 2000 CR series is fitted with various safety devices. A pressure relief valve in the distributor reduces the maximum system pressure when required, thus protecting the other high-pressure components against overload.

The injectors are actuated by 2/2-way valves, which are activated by the engine electronics. The control voltage here is up to 42 volts. The control valve was positioned very close to the nozzle needle so that there are only slight delays between the opening of the valves and the nozzle needle. This design therefore has the potential for multiple injection without any design changes having to be made to the control unit.

New MTU-Design Turbocharger

The 2000 CR engines are fitted with a powerful turbocharger system, in which two (in the 8V and 10V versions) and three turbochargers (in the 12V and 16V versions) are used. Only one turbocharger runs at low engine speeds; the second and third turbocharger are only engaged electronically at higher engine speeds. This sequential turbocharging ensures a powerful charge air flow and therefore an immediate and strong engine acceleration response across the entire performance map. The efficiency of the turbocharging system is enhanced by the integration of the charge air cooler into the engine Vee, as this shortens the path of the charge air flow.

The ZR 125 turbochargers were developed in-house by MTU, and are also manufactured internally by the company. At a maximum turbocharger speed of 85,000 rpm, they build up a maximum charge air pressure of four bars. The compressor wheel is made of aluminum, and are housed in a water-cooled carrier housing, which keeps the surface temperatures below 220 degrees Celsius stipulated by the SOLAS regulation (Safety of Life at Sea).

New ADEC Electronics

Another new item on the 2000 CR series is the new generation of MTU's Advanced Diesel Engine Control (ADEC) electronic engine management system, designed to be far more robust than previous versions.

During the development of the new ADEC, an easily programmable system interface and a flexibly usable functionality were integrated into the system interface. The engine controller now contains far fewer customer- and system interface-specific settings than previous versions. The variants for the different applications are supplied via the system interface. The use of a commercially available compact flash card in the system interface means that the system interface is easy to program.

An Ethernet interface enables remote diagnosis of the engine management system via the Internet.

Circle 5 on Reader Service Card

Converting and Repowering One Very Big Ship

When the decision was made to convert Dockwise's Blue Marlin to the world's largest semi-submersible vessel, there were obviously many key considerations, with the re-powering of the new ship topping the list. Wartsila was contracted for the job, which included supplying generating sets, two retractable bow thrusters and a large high-efficiency nozzle with new propeller blades for the main propulsion. Blue Marlin, originally built at CSBC in Kaohsiung, Taiwan (new-building 726) was delivered in 2000, equipped with one 6200 mm-diameter open Lips controllable pitch propeller, directly driven by a low-speed diesel engine

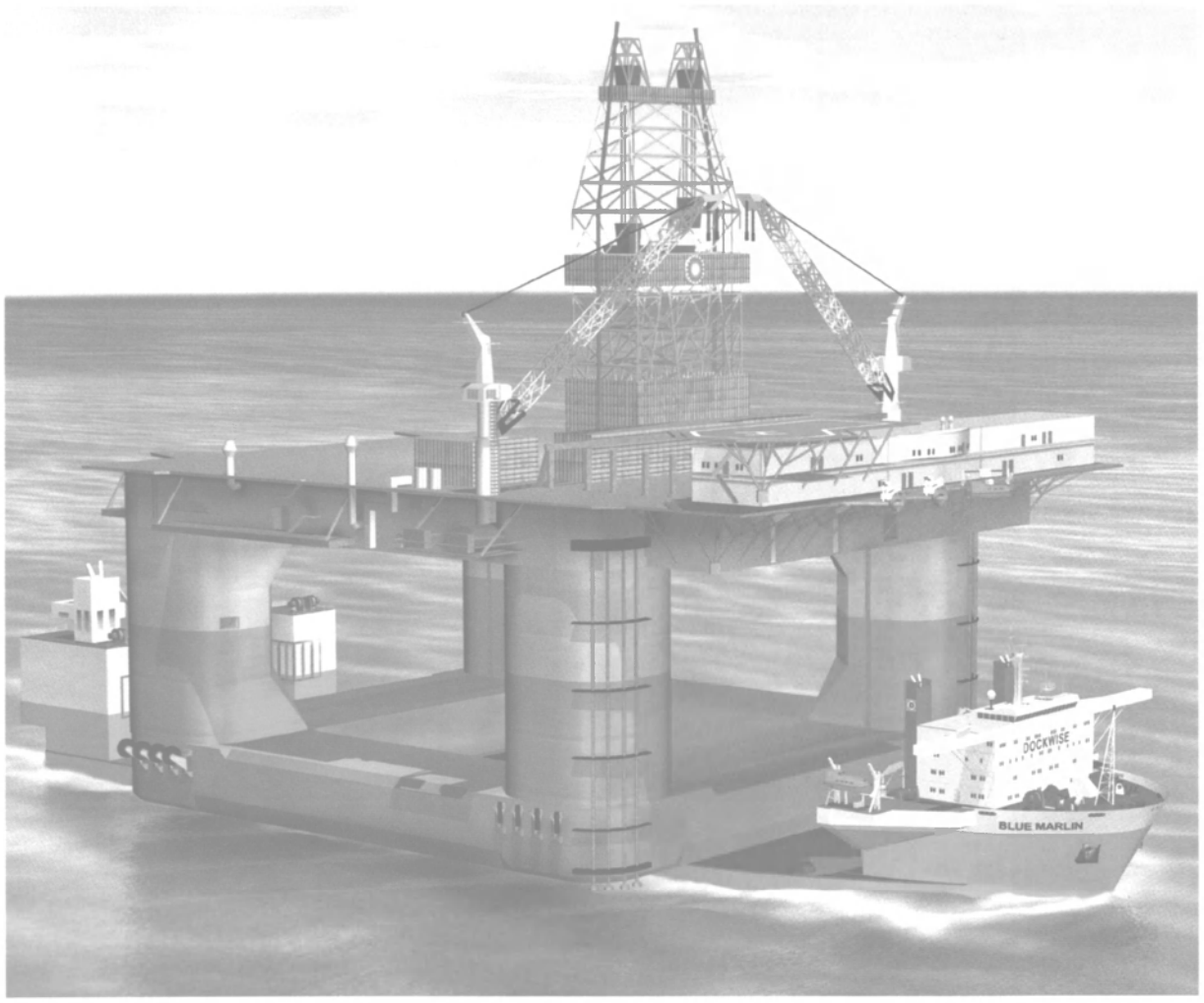
Vessel Particulars

Hub type / diameter	Lips 4C18 / 1800 mm
Nozzle type	Lips HR (high efficiency)
Propeller type	Lips Controllable Pitch Propeller
Propeller diameter	5,200 mm
Power	12,640 kW
Propeller speed	127 rpm
Number of installations	One

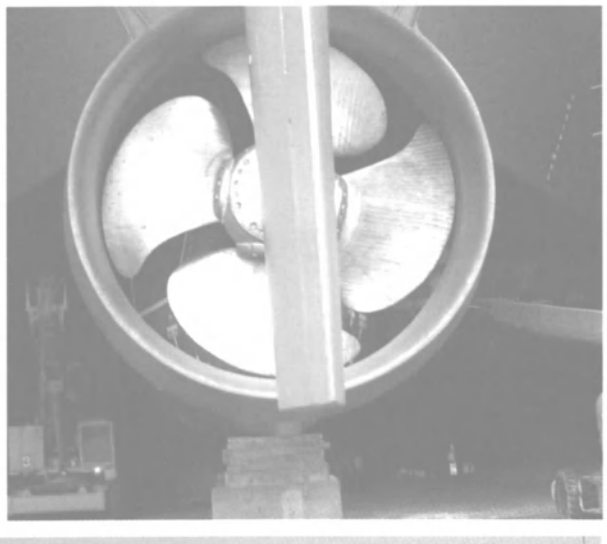
CPP, particulars after conversion.

LMT type	CS3500-671/3500MNR
Propeller diameter	3,400 mm
Propeller type	Lips Controllable Pitch Propeller
Propeller speed	187 rpm
Power	4,500 kW
Input speed	900 rpm
Number of installations	Two

Main Particulars	Before	After
Length bp	217.8 m	**224 m**
Breadth	42 m	**63 m**
Depth	13.3 m	**13.3 m**
DWT	57,021 tons	**78,000 tons**
Deck area	7,484 sq. m.	**11,227 sq. m.**



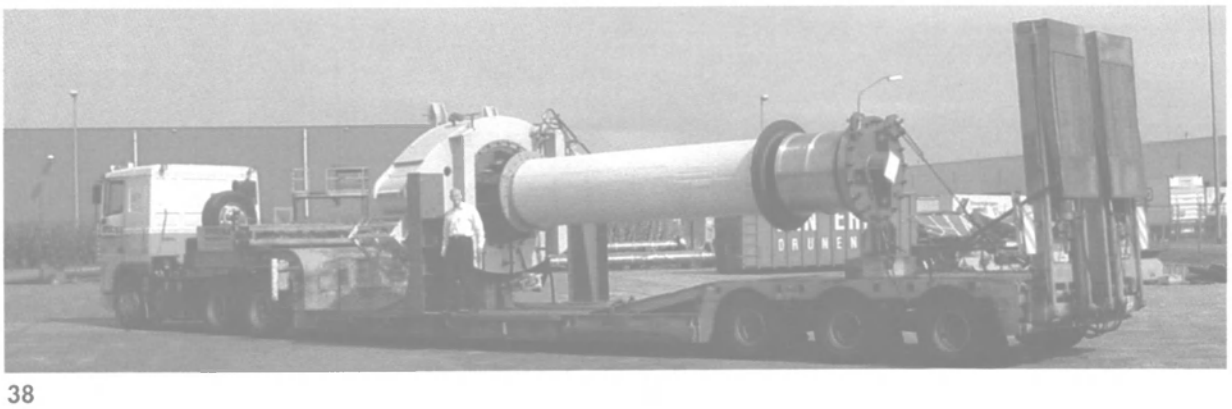
Blue Marlin - artist's impression after conversion.

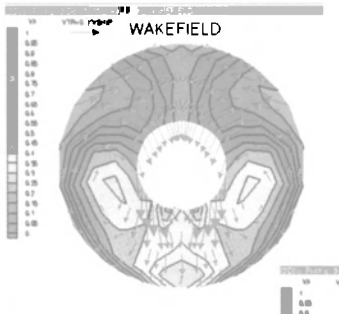


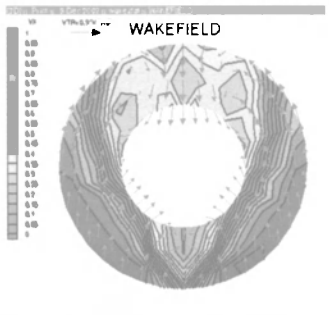
Left: Blue Marlin in drydock at HMD. The extreme width of the vessel just fits in the dock.

Right: CPP, HR nozzle and tunnel construction after modification.

Bottom Left: Transport of the stem section with a weight of 40 tons.







An enormous challenge in the creation of this mammoth vessel was ensuring it maintained an acceptable Wake Field: Above is the wake field before conversion, to the right is the wake field after conversion.

delivering 12,640 kW at 127 rpm. One transverse thruster was installed in the bow of the ship.

The conversion was carried out at Hyundai Mipo Dockyard in South Korea, and included increasing the breadth of the ship from 137.8 to 206.7 ft. (42 to 63 m). With an enormous unobstructed deck area of 11,227 sq. m., the Blue Marlin is now the largest semi-submersible vessel in the world. The deadweight of the vessel is 78,000 tons, enabling the vessel to transport heavy structures weighing up to 73,000 tons. With its new dimensions Blue Marlin is able to transport heavier and ultra-large floating production and drilling platforms and larger semi-submersible drilling units.

The propulsion requirements for the much larger vessel were investigated in model tests at MARIN in the Netherlands. In the sea-keeping tests it became clear that the vessel required more thrust to operate safely, especially in adverse weather conditions. Wärtsila won the contract to supply three Wärtsila 8L32 generating sets and two electrically driven Lips retractable thrusters in September 2002.

The first commitment for the Blue Marlin in this top segment of the heavy transport market has already been made. In the summer of 2004 the Blue Marlin will transport an ultra large and heavy semi-submersible Production Drilling and Quarters unit with a length of 163.8 m, a width of 125.89 m, a height of 129.1 m and a weight of approx. 60,000 tons. In addition the new vessel will be able to transport and dry-dock even larger semi-submersible and jack-up drilling rigs than have been possible in the past.

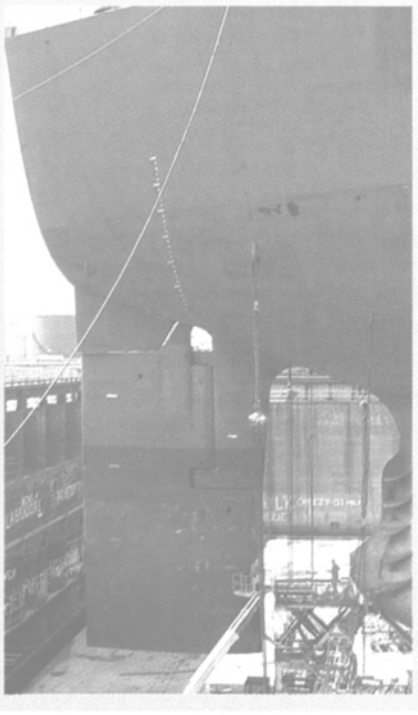
Circle 47 on Reader Service Card

World's Largest Bulker in for Fix

Machine Support B.V. recently completed an stern tube alignment job on what is touted to be the world's largest dry bulk carrier, Berge Stahl, which is a 1,125-ft. (343 m) long and 213.2 ft. (65 m) wide ship that can hold 360,000 tons of iron ore. The carrier is fully dependent on the port of Rotterdam, since this is the only port on the European continent that this ship can access with its 75 ft. (23 m) draft.

The main diesel engine is three story high Hyundai - B&W 7L90MCE.

Circle 65 on Reader Service Card

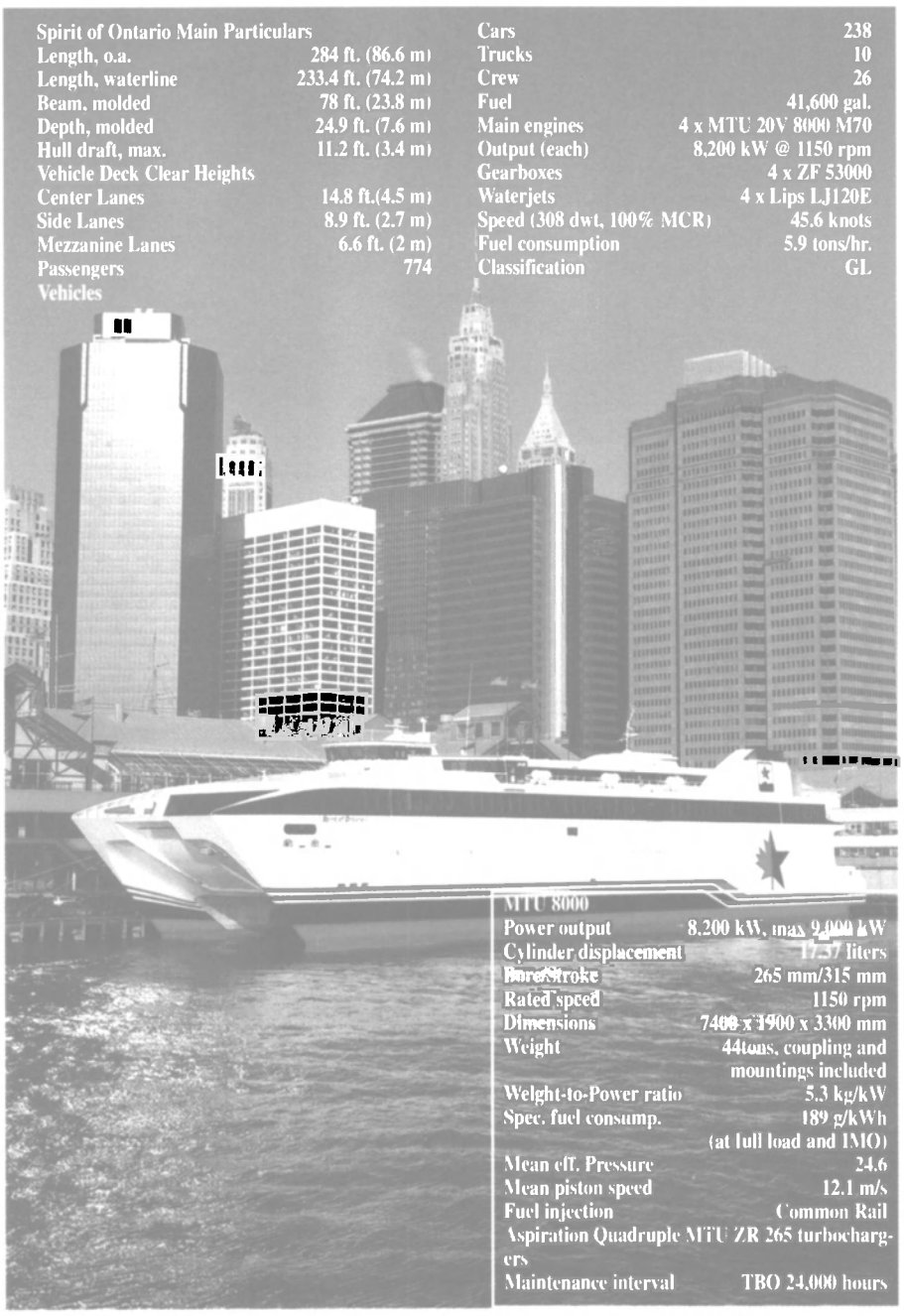


Power for a New Breed of RoPax

Building fast RoPax vessels is nothing new for Australia's Austal Ships. The company, founded just 16 years ago, has quickly crafted a reputation as one of the largest and best builders of aluminum craft in the world, and today boasts an annual turnover in excess of $250 million.

Spirit of Ontario, however, is in a different league.

The ship arrived last month from its birth place Down Under to start work for Canadian American Transportation System on the commuter route between Rochester, NY, and Toronto, ON. Its inaugural route to work took it on tours through the Hawaiian Islands and eventually to Pier 17 at New York City's South Street Seaport, allowing Austal, MTU, Wartsilä, ZF and Germanischer Lloyd executives the opportunity to discuss the ship as a commercial option in the burgeoning U.S. fast ferry market, as well as point out the ship's endless military potential on the eve of the awarding of the Littoral Combat Ship (LCS) contract.



Spirit of Ontario Main Particulars	
Length, o.a.	284 ft. (86.6 m)
Length, waterline	233.4 ft. (74.2 m)
Beam, molded	78 ft. (23.8 m)
Depth, molded	24.9 ft. (7.6 m)
Hull draft, max.	11.2 ft. (3.4 m)
Vehicle Deck Clear Heights	
Center Lanes	14.8 ft.(4.5 m)
Side Lanes	8.9 ft. (2.7 m)
Mezzanine Lanes	6.6 ft. (2 m)
Passengers	774
Vehicles	
Cars	238
Trucks	10
Crew	26
Fuel	41,600 gal.
Main engines	4 x MTU 20V 8000 M70
Output (each)	8,200 kW @ 1150 rpm
Gearboxes	4 x ZF 53000
Waterjets	4 x Lips LJ120E
Speed (308 dwt, 100% MCR)	45.6 knots
Fuel consumption	5.9 tons/hr.
Classification	GL

MTU 8000	
Power output	8,200 kW, max 9,000 kW
Cylinder displacement	17.57 liters
Bore/Stroke	265 mm/315 mm
Rated speed	1150 rpm
Dimensions	7400 x 1900 x 3300 mm
Weight	44tons, coupling and mountings included
Weight-to-Power ratio	5.3 kg/kW
Spec. fuel consump.	189 g/kWh (at full load and IMO)
Mean eff. Pressure	24.6
Mean piston speed	12.1 m/s
Fuel injection	Common Rail
Aspiration	Quadruple MTU ZR 265 turbochargers
Maintenance interval	TBO 24,000 hours

A Breed Apart

Spirit of Ontario stands out amongst an increasingly cluttered field of fast craft contenders. Based on the popular Auto Express 86 design, a 284-ft. (86.6 m), 774-passenger, 238-vehicle vessel capable of carrying its full load at 45.6 knots. While Austal stakes its leadership claim, Chris Pemberton, Vice President, Sales and Marketing for Austal USA, is quick to point out that success was not built alone, citing a long and mutually beneficial relationship with primary power supplier MTU, among others.

"Fast ferries are our forte" and we have an approximate 60 percent market share, said Bernard Bentgen, Vice President, Marine Sales in NAFTA for MTU. "High power density, advanced technology, reliability, and expert service and support are the most important criteria to high-speed shipbuilders."

It is, in fact, the MTU powerplants that help make this vessel special, as four of its state-of-the-art MTU 20V 8000 M70s, generating a cumulative 44,000 hp (32,800 kW) at a rated speed of 1150 rpm, is a core component of its success. Power without performance is useless in the commercial market, so it is worthy to note that fuel consumption is below 195 g/kWh across a very broad power range and less than 190g/kWh at the most economical point, while keeping NOx emissions below the limits required by IMO.

MTU has had a 14-year relationship with Austal, and in that time has produced 250 engines for the company.

Beyond the propulsion, Spirit of Ontario offers a host of amenities aimed at keeping the vessel safe, efficient and comfortable for both crew and passengers.

Roll-on/roll-off capabilities allow for a fast loading of the two vehicle decks, with Pemberton estimating a loading time of approximately 15 minutes. The two passenger decks are equipped with business travel amenities such as restaurants, bars, two movie theatres, and a variety of seating arrangements as well as satellite TV and Internet access.

Market Opportunities

According to a survey conducted by the Volpe National Transportation Systems Center in Cambridge, Mass., high-speed ferries account for only 10 percent of the overall national U.S. ferry fleet. With the option of taking cars, buses and trucks on board, more and more coastal and waterway communities will demand fast ferry transportation to keep traffic afloat.

High speed car ferries in the U.S. are starting to emerge, with the Great Lakes, Hawaii and areas around large cities the primary targets for these vessels, said Pemberton.

"Austal USA has already successfully completed six vessels including two high speed passenger catamarans that are operating here in New York," said Pemberton. "We now have the capability to produce vessels such as 'Spirit of Ontario 1', which was built by Austal in Australia, here in the U.S. In fact less than two weeks ago we launched our largest ferry yet, a 58-m catamaran that will operate across Lake Michigan for Lake Express LLC."

Austal and MTU have successfully partnered on a number of other projects. This fall, Austal will launch one of the world's largest high-speed ferries - a 126-m high-speed trimaran accommodating 1,350 passengers and over 340 cars - which will be taking up service in the Canary Islands for the Spanish ferry operator Fred. Olsen, SA. This vessel, on which the Littoral Combat Ship design is based, will be powered by four MTU 20V Series 8000 diesel engines.

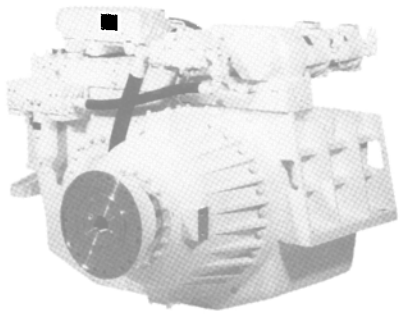
Four MTU 16V Series 4000 engines will power the Lake Express ferry which has capacity for 248 passengers and 46 cars. With a speed of 34 knots, it will link Milwaukee, Wis. and Muskegon, Mich. in just over two hours, saving a lengthy drive around the southern shore of Lake Michigan, which includes the traffic congestion in Chicago.

Commercial and military organizations worldwide are gradually investing into high-speed vessel technology. High-powered multi-hull ships are the perfect candidate for public waterway transportation, coast guard and police patrols as well as military programs such as the Littoral Combat Ship or the Theatre Support Vessel.

ZF Helps to Harness Spirit of Ontario's Power

ZF Marine gears are on board the Spirit of Ontario, helping to harness the power of what is reported to be the most powerful fast ferry in the U.S. ZF Marine supplied four ZF 53000-1 NRH non-reversing, horizontal offset transmissions to mount behind MTU 20V 8000 M70 engines rated at 8,200kW.

ZF 53000-1 NRH transmissions are designed to be lightweight, while offering a high power density for top performance. The hardened and ground gear teeth and carefully configured hydraulic systems ensure reliability, safety, and comfort during operation.



Each of the four gearboxes on the Spirit of Ontario feature ZF Antiflex Mounting Systems.

The design of ZF's Antiflex Mounting System absorbs and reduces stresses on the main housing when the vessel's hull deflects in rough waters. ZF PTO's were also required for this application to control the steering of the vessel's waterjet propulsion system.

Circle 8 on Reader Service Card

Last year Austal was awarded a contract to build 12 new patrol boats for the Royal Australian Navy (RAN). It is anticipated that these 56-meter vessels will each be fitted with two MTU 16V Series 4000 diesel engines, continuing a long association between MTU and the RAN.

"Vessels providing transport, coastal patrol and other military and law enforcement missions perform varied and demanding tasks. We are respected by the World's navies for providing advanced high-power technology, ranging from basic twin-engine plants to high complex and complete systems including diesels and gas turbines," said Bentgen.

"The U.S. Marine Corps have been using a large Austal catamaran as a troop and equipment transporter for nearly three years with great success and we have also designed a revolutionary trimaran platform for the General Dynamics bid for the Navy's Littoral Combat Ship project," said Pemberton. "We are also currently building 22 naval patrol boats at Austal Ships in Australia."

For more information from Austal
Circle 9 on Reader Service Card

For more information from MTU
Circle 10 on Reader Service Card

Greece Poised for Posidonia 2004

The year 2004 is shaping to be a monumental year for Greece, with the pinnacle being the hosting of the 2004 Summer Olympics from August 13-29 in Athens. While a maritime exhibition can hardly be mentioned in the same breath as an Olympic Games in terms of stature, the staging of the 19th biennial International Shipping Exhibition to be held in Greece — Posidonia 2004 — is a significant event for the international maritime community, particularly given the country's long and storied maritime tradition.

Modern Greek shipowners continue to carry on the legacy, and in the first three months of 2004, they have invested an estimated $2.4 billion in newbuilding projects involving a wide variety of modern tonnage, including VLCCs, VLGCs, high-spec ice-class tankers from Suezmax down to Handysize product tankers, containerships, bulk carriers of all sizes and passenger ships. This investment was matched by deals struck by Greek operators in the second-hand ship market, as the massive renewal of the Greek fleet continues.

With this the case, it becomes clear to see why more than 1,500 shipping-related companies from more than 70 countries have booked space at Posidonia 2004, expecting to exhibit their wares in more than 23,000 sq. m. of exhibit space to an estimated 16,000 visitors and buyers. Once again event will be held in the Piraeus Port Authority Exhibition Center on the Piraeus waterfront, from June 7 to 11, 2004.

The renewal and modernization of the Greek owned merchant fleet has seen more than 400 ships ordered by Greek interests since 2000, and has seen the investment in new tonnage hovering at an estimated $7 billion.

Currently the new ship orderbook stands at more than 300 vessels from 75 different companies, which are now providing almost 18 percent of all work being undertaken by the world's shipbuilders.

According to the Union of Greek Shipowners, this fleet renewal has not only required an investment equivalent to two annual Greek budgets, it has lifted Greek shipping to the forefront of the shipping industry's drive for quality shipping.

The flow of new tonnage into Greek hands means Greek ownership accounts

for more than 4,000 ships, representing approximately 174 million deadweight trading and on order, provides direct employment for almost 200,000 people ashore and some 120,000 people at sea. Keeping this fleet insured and operational also costs an estimated $5 billion a year, money which ends up in the hands of shipping related industries all round the world.

Posidonia aims to bring together thousands of the maritime industry's leading players and personalities, from financiers, charterers, shipbuilders, shipoperators, equipment manufacturers to the providers of the support services who have the opportunity to exchange views throughout the week at formal and informal meetings and receptions and parties.

Long considered one of the industry's premier social occasions, Posidonia has shown the ability to successfully meld serious business with leisure activity.

Posidonia 2004 Details

What	Posidonia 2004
Where	Port of Piraeus Exhibition Center
When	June 7 to 11, 2004

The Posidonia Exhibition Opening Hours:

Tuesday 8 June	11:00 - 19:00
Wednesday 9 June	11:00 - 19:00
Thursday 10 June	11:00 - 19:00
Friday 11 June	11:00 - 17:00

For information
www.posidonia-events.com
Posidonia Exhibitions SA
4-6 Efplias Street, 185 37 Piraeus, Greece
Tel: +30 210 4283608
Fax: +30 210 4283610
Email: posidonia@posidonia-events.com

The Posidonia Cup 2004 sailing race once again kicks-off Posidonia. Organized by Posidonia Exhibitions and the Hellenic Offshore Racing Club, and sponsored by Lloyd's Register, the event this year on Friday June 4 has already attracted over 30 race entries which will compete over a course off Piraeus, that will criss-cross many of the courses to be raced during the Athens 2004 Olympic Games.

Posidonia, The International Shipping Exhibition 2004 is sponsored by: the Greek Ministry of Mercantile Marine, the Municipality of Piraeus, the Hellenic Chamber of Shipping, the Union of Greek Shipowners, the Greek Shipping Co-operation Committee, the Union of Shipowners of Mediterranean Cargo Vessels, the Greek Association of Passenger Ship Companies and the Union of Coastal Passengership Owners.

LR First for Greek Security
Lloyd's Register EMEA [Europe, Middle East and Africa] was authorized by the Hellenic Republic as a recognized security organization (RSO) for ports in Greece in accordance with the requirements of the International Ship and Port Facility Security (ISPS) Code. This recognition makes Lloyd's Register EMEA the first international classification society to be authorized by Greece to act as an RSO both for ships flying the Greek flag and for ports in Greece.
Circle 33 on Reader Service Card

ABS Authority Expands in Greece
ABS has signed a new agreement with the Greek Shipping Ministry expanding its authority to perform statutory certifications on its behalf. This includes survey and certification services for passenger vessels, including ships engaged exclusively in domestic voyages such as island ferries under the Hellenic flag, as well as certifications to the IMO's International Ship and Port Security (ISPS) Code.
Circle 34 on Reader Service Card

ESLSC Adopts SES Software
Shipmanagement Expert Systems (SES) announced that Ethiopian Shipping Lines S.C. (ESLSC) selected SES products as the solution for its requirements. SES' local systems integration and implementation partner Ernst & Young Ethiopia in collaboration with SES' team will implement a complete solution for all departments according to ESL SC' s needs.
Circle 35 on Reader Service Card

Optimized Dual-Stage Bilge Water Separator at Posidonia
With tough new IMO regulations demanding sweeping changes to conventional oily bilge water separation practices, Coffin World Water Systems (CWWS) is the new dual-stage SPIR-O-SEP Bilge Water Separator, which combines a first-stage coalescing separator with proprietary ultra-filtration membranes in the second stage to separate and remove free and emulsified oils from bilge water. It can produce clean water with less than 5 ppm oil content. CWWS expects full certification of the SPIR-O-SEP unit prior to the Posidonia 2004 Exhibition in June. Because of the fundamental differences in technologies for separating free and emulsified oils, the revised IMO regulation effectively demands the redesign of all existing oily water separators, along with testing and certification of oil content alarms. Separators certified to the new standard must be installed on all newbuilds with keels laid after January 1, 2005. Recent rulings from N. American and European certifying agencies confirmed that the requirement extends to all new bilge water separators installed after Jan. 1, 2005, even on existing vessels. They are available in seven models with capacity ranging from .25 to 10 cu. m.
Circle 46 on Reader Service Card

Leif Höegh Records Strong First Quarter

Operating profit before sales gain and depreciation for Leif Hoegh & Co. Limited (LHC) for the first quarter showed a significant improvement compared to first quarter of last year. HUAL experienced a strong first quarter. The car carrier market continues to be very tight, with all operators experiencing space pressure. The strong cargo availability out of the Far East continued. In February another large PCTC newbuilding on long term charter was delivered. During the first quarter HUAL entered into long term charters for further two PCTC newbuildings to be delivered in 2007. HUAL was in April awarded as "General Motors Supplier of the Year 2003" for its overall business performance in providing GM with ocean services. The LNG vessels and the two wholly owned Capesize vessels operated under their long term charter contracts without any disruptions.

LHC had 9 open hatch vessels in the Saga Pool at the end of the quarter after delivery of one vessel to new owner in January.

HUAL, the Ro/Ro car carrying unit of Leif Hoegh & Co, is one of the world's leading operators of car carriers with a fleet of 45 Ro/Ro vessels in its commercial operation. HUAL has seven large Ro/Ro newbuildings on order for delivery 2004 to 2007 and further 4 large Ro/Ro newbuildings will be taken on long term charter (in addition to three already delivered).

BV Launches LNG CAP

Bureau Veritas launched a unique Condition Assessment Program for LNG carriers. The CAP works in a similar way to existing Harmonized CAP programs for oil tankers, but has special requirements unique to LNG carriers.

Speaking at the SIGTTO annual meeting in San Francisco, **Bruno Dabouis**, commercial manager of BV said, "The LNG market is opening up and there are signs that a spot market for LNG carriers may further develop. That means charterers need to be able to demonstrate that they have taken special care when chartering in older vessels, a new phenomenon in the LNG market. Bureau Veritas, the only classification society present in all types of LNG containment systems and propulsion systems, and with a unique pedigree stemming right back to the very first LNG carriers, was well placed to support the current market changes with technical expertise. "BV has brought together its deep research and development into sloshing loads and structural detail, its experience with lifetime structural maintenance, its successful and fully accepted tanker CAP program and its experience with LNG carriers to develop a CAP for LNG vessels. It is fair to both owners and charterers, and has been accepted by Shell, BP and Total already."

BV's experience with LNG carriers in service was also instrumental in it winning a tender to provide a life extension study, through its Tecnitas consulting arm, for seven existing LNG carriers operated by Nigeria LNG in the Nigerian Bonny Gas Transport project, working for Shell.

The LNG CAP has already been applied in practice to life extension studies on two LNG carriers.

The LNG CAP is implemented as a voluntary program by shipowners and can therefore apply at any time within the life of the vessels. However, in practice, it is actually more relevant to LNG carriers reaching 20 years old.

Shipbuilding Future

Steel, Ship Prices Soar as Tankers Stay Firm

Soaring steel prices are now a major concern for leading shipbuilders. Uncertainty about spiraling material costs is even causing some yards to defer new orders, market reports indicate. "The lack of steel in some shipyards of the three major shipbuilding nations is causing newbuildings for 2007 and 2008 to be delayed," says New York tanker broker Poten & Partners in a recent market report. "Some shipyards are not accepting any more ship orders beyond late 2007 or 2008 delivery because of the lack of berth availability, insecurity stemming from the dollar's weakness, as well as uncertain steel cost," the broker says.

China may as well build ships, says Poten, as "they're taking all the steel". Steel prices have risen by $140 over the last two years, largely on the back of Chinese demand, Poten declares. And, commenting on current demolition rates, the New York firm explains that "steel needed to build bridges, roads and housing to accommodate the millions of people relocating to China's urban areas from remote rural villages has sent scrap prices above $400 per ldt from the low $100s/ldt approx two years ago".

The fact that sophisticated vessels such as LNG carriers and container ships are in heavy demand is further taxing shipyard capacity and new ship prices are rocketing. By way of comparison, Poten points out that a VLCC cost about $70m to build in 1999. This month, says Poten, the price for a new VLCC has risen to $86m, based on 2007 delivery. However, current VLCC market rates, which averaged W97 last month from the Arabian Gulf to the Far East, equivalent to $61,000 a day, are expected to decline to lower levels, with seasonal change, says Poten. But owners are falling over themselves to get their hands on prompt tonnage. This, says Poten, has meant that modern secondhand VLCCs now cost just about as much as new ones. Owners don't want to wait until 2007/8 - they want new tonnage now. Says Poten: "Suezmaxes, Aframaxes and Panamaxes are seeing the same type of price increases. A Suezmax newbuilding is quoted at just over $57m this month," the broker reports, the highest price in a decade. Meanwhile Aframaxes are being quoted at up to $47m, up from $36m in April 2000 and Panamaxes prices are around $37m, up from $27m two years ago.

In this latest bull market run, tanker companies continue to report record earnings. Most recently Teekay has declared record profits, with first quarter net income of $189m, up 253% from $53.6m in the corresponding period last year.

The company explained that high spot rates were partly the reason for the better figures, whilst the integration of Navion was another key factor.

Meanwhile a senior executive at tanker company Stelmar declared a bullish view of the future. Peter Goodfellow, chief executive, told Bloomberg news that current strong demand in both the East and West, led by China and the US, is very unusual and provided the company with a good opportunity to reposition ships profitably. Historically, it was not easy to find profitable cargoes to reposition ships for repairs in the east, Goodfellow said, but now Asian growth was far outstripping expansion in the US, he said.

OMI meanwhile has reported its best ever quarter and anticipates that the strong tanker market will last for several years.

The first quarter profit of $56.41m was up from $25.73m one year earlier and was not only the company's best ever figure but was actually more than annual income in all but two of the years since 1984. According to OMI figures, the world's tanker fleet comprised 295.3m dwt at the end of March. The orderbook of just over 83m dwt represented 28.1% of the fleet.

Tanker Company Guilty

Jo Tankers Fined $19.5M

Jo Tankers B.V. has agreed to plead guilty and pay a $19.5 million criminal fine for participating in an international cartel to allocate customers, rig bids, and fix prices on parcel tanker affreightment contracts for shipment of specialty liquids to and from the U.S. and elsewhere.

On Ice

Ice Class & Large Ships Pose New Challenges

New challenges lie in store for northern shiprepair yards as a new generation of ultra sophisticated ice-class tankers join the fleet. So far, South Korean builders are in the vanguard of these new vessels' construction, built to carry oil from reserves located in some of the world's coldest and most inhospitable places. But ship designers, coastal states with seasonal or year-round ice and classification societies are all preparing for new vessels in the Aframax and Suezmax categories. Designs are being model-tested and new construction criteria are being drawn up by leading class societies such as Lloyd's Register, DNV and ABS. The new vessels will lift cargoes in the North Baltic, the Arctic and Far Eastern areas of Russia. Exports from the Former Soviet Union have already increased by 50% since 1996. But Russian oil cargoes, piped to Primorsk, have expanded from 12m tons in 2002 to a forecast 42m tons this year and some analysts believe volumes could soar to well over 100m tons by 2010. Lloyd's Register believes that new designs of "double-acting" tankers - ships that are built both for conventional open-sea operation but with ice-breaking capability running full astern - will provide potential for some of the northern-most oil developments. The Tempera and Master double-acting tankers were delivered to Finnish energy group Fortnum Oil and Gas last year. The Sumitomo-built 106,000 dwt vessels are built to sail forward through light ice, but astern through heavy ice conditions. With azipods and thrusters, the tankers can turn through 180 degrees and will be deployed on a special route around the Turku archipelago off the coast of Finland.

Container Terminal

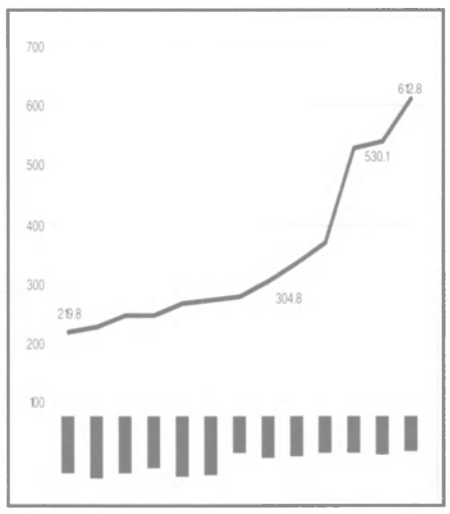
Project Approved for VA

APM Terminals North America Inc. announced plans to build a container terminal located on the Elizabeth River in Portsmouth, Virginia. Dredging is expected to start later this year, and construction of the terminal is expected to be completed in 2007. The facility will feature 4000 ft. of deepwater berth space (four times the current amount), and serve as a Mid-Atlantic platform for future growth.

Index Fleet Value

The Index Fleet Valuation is representative of the resale market for Bulk Carriers and Tankers as a whole. The Index Fleet consists of 15 vessels, nine Bulk Carriers and six Tankers, of various size and ages. Fluctuations in the value of the world fleet are mirrored in the Index Fleet.

Current Market Valuation	612.8
One Month Ago	540
Six Months Ago	28.2
One Year Ago	219.1



This report, compiled by Shipping Intelligence of New York (212) 997-0966, tracks the sale prices of secondhand bulk carriers and tankers.This report, compiled by Shipping Intelligence of New York (212) 997-0966, tracks the sale prices of secondhand bulk carriers and tankers.

Is it Time to Hit the Panic Button?

Panic buying is putting further pressure on future steel supplies as prices continue to spiral. Reports indicate a substantial leap in hot rolled steel plate prices during March and further significant increases, not yet quantified, through April. According to MEPS, a UK-based steel industry analyst, its Asian hot rolled plate index rose by almost 14% during March. Further increases are inevitable in the second quarter as steel producers wrestle with roaring demand and increasingly tight raw material supplies. It is a Catch 22: spiraling steel consumption is generating unprecedented demand for iron ore and coal which, in turn, is fueling ocean freight rates and leading to congestion, port delays and pressure on landward distribution systems. Higher raw material prices filter through directly to steel prices which, in turn, lead to panic buying and stockpiling. Analysts are not expecting any let-up in the second or third quarter.

New VLCC Company

Mitsui OSK Lines has teamed with Emirates Trading Agency LLC, Dubai (ETA) to establish a joint venture company providing operating services for very large crude carriers (VLCCs).

New LNG Terminal for Port Arthur, Texas

Sempra Energy LNG announced plans to develop and construct a new $600 million LNG receiving terminal near Port Arthur, Texas, capable of processing 1.5 billion cu. ft. (Bcf) of natural gas per day. The facility would be constructed on part of a 3,000-acre parcel of land along the Port Arthur Ship Canal. The announcement coincides with a pre-filing notification the company submitted to the Federal Energy Regulatory Commission (FERC). This notification begins the process of securing the required FERC approval for Sempra Energy LNG's third state-of-the-art receiving terminal. The Port Arthur LNG project is expected to begin operating in 2009.

ACL Makes Changes

American Commercial Lines (ACL) announced that **Stephen A. Frasher** stepped down as President and CEO effective April 30, 2004. **Richard L. Huber** assumed the position of CEO of ACL. **W. Norb Whitlock** will become President and COO of American Commercial Barge Line LLC, Louisiana Dock Company LLC and American Commercial Terminals LLC and will join the ACL Board of Managers.

VT Halter Launches LSV

VT Halter Marine Inc., a subsidiary of Vision Technologies Systems Inc., launched the US Army Tank-automotive and Armament Command's (TACOM) newest Logistic Support Vessel (LSV) the MG Robert Smalls.

Valued at approximately $25 m, the LSV-8 has an overall length of 313 ft., a beam of 60 ft. and a molded depth of 19 ft. Designed and built to carry over 2,000 tons of deck cargo, that could include combat vehicles or armament cargo, the vessel is capable of supporting logistic efforts worldwide.

This is the first Army ship named after an African American and a Civil War hero.

JRC Proposes Integrated Nautical Safety System

In the past decade more than 25,000 accidents have been caused by ships maneuvering under adverse environmental or traffic conditions. A leading cause of many of these accidents - by some estimates up to 70 or 80 percent - are due to "human error," confirmed by the fact that international organizations such as the International Maritime Organization (IMO) are dedicating significant time and resources to studying the problem and developing solutions.

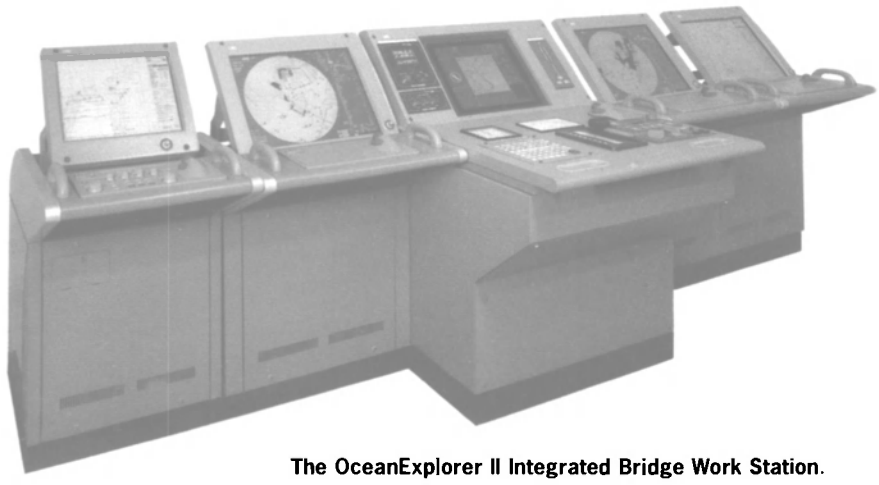
The marine electronics community has used this trend to steadily build complete bridge systems which are increasingly integrated "plug and play" units. A high level of corporate consolidations has significantly aided this trend.

An example of complete integration is the Integrated Nautical Safety Systems - dubbed OceanExplorer II - from Japan Radio Co. OceanExplorer II is designed to reduce, by ergonomic improvement, the working environment such as the design of the workstation and the man/machine interfaces. It is, in principle, designed in accordance with DNV NAUT -AW and adopts their characteristics to support safer voyages.

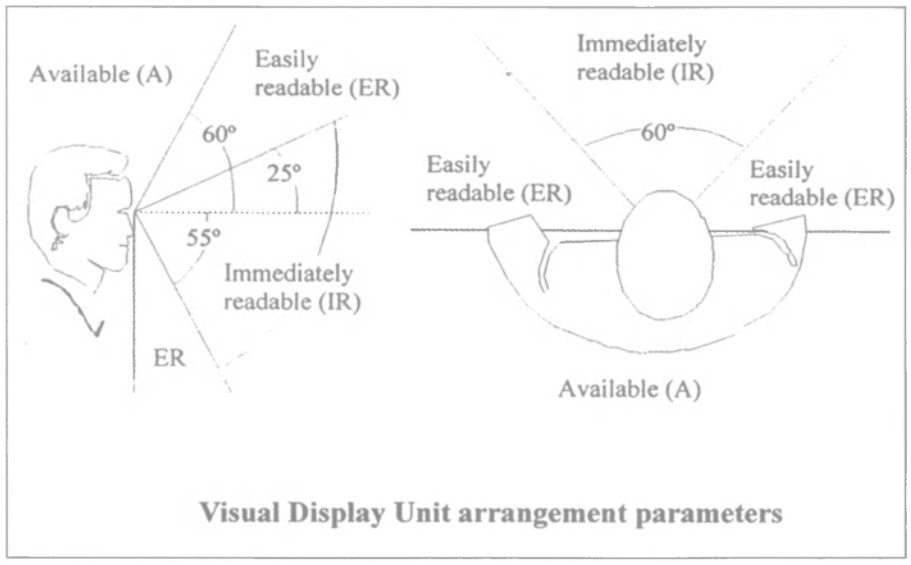
The arrangement of the integrated workstations ensures that all instrumentation and controls necessary to perform tasks are within reach, easily accessible and immediately or easily readable, depending on their determined function. In particular, "within reach" should be allocated those instruments and controls that will be used most frequently.

Any changes of the environment, including surrounding ships and sea conditions, can be easily recognized by ship personnel immediately on the bridge which is design decided ergonomically.

ECDIS



The OceanExplorer II Integrated Bridge Work Station.



Visual Display Unit arrangement parameters

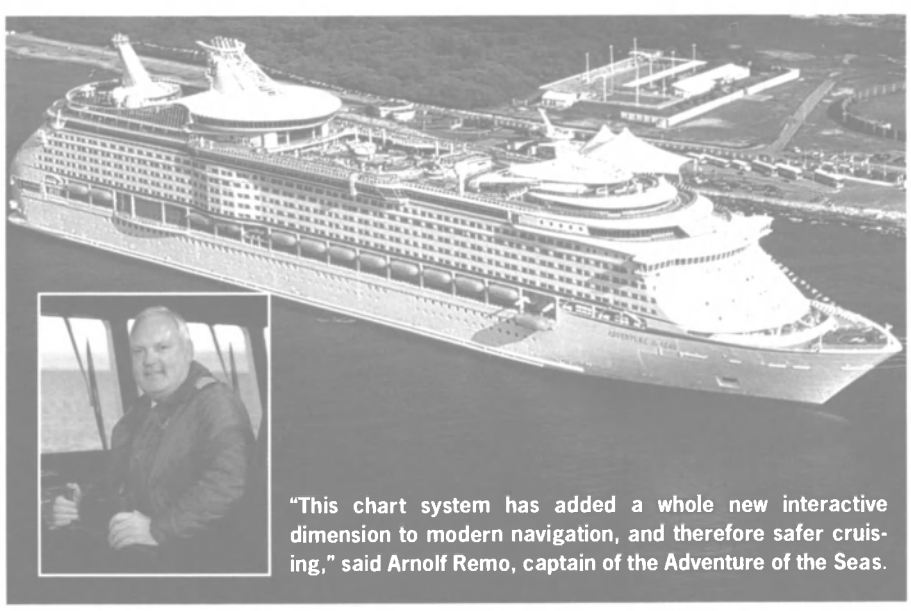
The JRC ECDIS JAN-901 ECR is designed to display radar video, electronic chart and nautical information. The electronic chart is able to display two different areas simultaneous in different chart scales to monitor ships progress or destination, and track review as Windows.

The Track Control System with OceanExplorer II (ie. Automatic Navigation & Track Keeping systems [ANTS]) is designed to achieve reliable, economical and safe voyages, particularly in narrow channels, with ECDIS. The track accuracy is kept by high performance processing of real-time data from GPS, speed log, gyrocompass (rate of turn), rudder order/response, and controlling ships course and position to minimize difference from the planned route on the software of the ECDIS.

The chart radar is a harmonized system with ECDIS. All nautical information necessary is in one display, which effectively helps to reduce human errors. Also, this may help to minimize a number of displays on the bridge. The duplication of this multi-function radar also increases redundancy.

Circle 2 on Reader Service Card

Royal Caribbean Stays Current with C-MAP CM-93/3 ECs



"This chart system has added a whole new interactive dimension to modern navigation, and therefore safer cruising," said Arnolf Remo, captain of the Adventure of the Seas.

The C-MAP CM-93/3 global electronic chart database helps Royal Caribbean Intl. vessel operators to ensure smooth, safe sailing whether cruising the icy waters of Alaska, or the warm currents of the Southern Caribbean tropics or through the Panama Canal.

Arnolf Remo, captain of the Adventure of the Seas, said "Since early 2003 we have been using the C-MAP system on the Adventure of the Seas. This chart system has added a whole new interactive dimension to modern navigation, and therefore safer cruising. We are able to look ahead and have an indication of any underwater or overhead concerns to the vessel, as we enter our allowable safety depths and heights. Each chart area can also be customized by us to suit our needs in each different situation and location. The easy-to-use C-MAP charts help my Navigation Officers plan, execute and monitor our voyage plans in a safe and efficient manner to a level never seen before."

"With our Sperry Voyage Management System and the C-MAP worldwide CM-93 database all on one CD, each of our vessels has the perfect navigational instruments to provide our customers with the smooth sailing experience they expect," said **Bob Granley**, superintendent of Royal Caribbean International.

C-MAP's advanced RTU format is

available free to all subscribers of C-MAP's CM-93/3 commercial chart database. This format enables the navigator to download NTM corrections directly into the ECDIS/ECS (Electronic Chart Display and Information System/Electronic Charting System) quickly and securely from any location around the globe.

Circle 3 on Reader Service Card

C-Map's RTU and the Ending of the Paper Trail

The introduction of the electronic chart is a major step forward in improving the safety of navigation at sea, as it save mariners time and effort and improves safety, and offers optimized functionality. ENCs (Electronic Navigational Charts), issued by Hydrographic Offices, are now recognized as charts as defined by SOLAS, provided they are displayed on a type approved ECDIS (Electronic Chart Display Information System) and are kept updated.

It is the responsibility of National Hydrographic Offices to produce ENCs. Production of ENCs has proved more difficult than anticipated and to date nominally 15 percent coverage exists. The gaps can be filled in with commercial vector electronic charts which although functionally similar to ENCs are not recognized by the IMO as equivalent to paper charts. Nevertheless they permit seamless electronic chart navigation, albeit in conjunction with the paper chart where ENC coverage is not available. C-MAP supplies production and quality tools to Hydrographic Offices for the production of ENCs. It also carries out subcontract work on behalf of a number of Hydrographic Offices. It is anticipated that both of these activities will accelerate the production and availability of ENCs.

C-Map aims to make updating electronic charts quick and cost effective with its Real Time Updating Service.

The original concept put forward by the International Hydrographic Office for a series of Regional Electronic Chart Centers to distribute ENCs has proved difficult to implement. C-MAP has implemented a strategy based upon working with HOs and entered into distribution and licensing agreements with them. Having adopted this strategy C-MAP is able to offer a worldwide database of electronic charts together with a distribution, licensing and updating infrastructure. ENCs and commercial electronic charts may be updated by means of CDs or floppy discs, but delivery of these is subject to similar delays to those that apply to paper NMs and they can arrive in batches and several weeks could have elapsed from the time when the update was originally issued to it being available for the ships officer to bring his charts up to date.

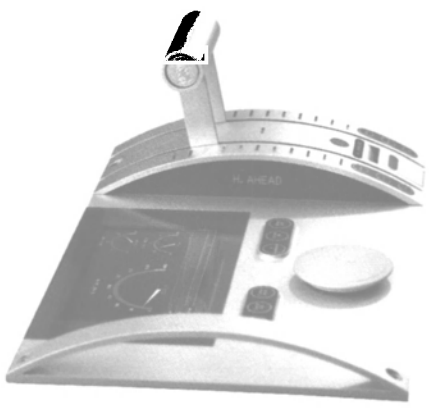
The obvious solution is to correct electronic charts automatically via satellite communication, telephone or landline, but the cost factor has prohibited many ship owners and managers from adopting this methodology. C-MAP's solution is Real Time Updating Service (RTU), as files are compressed to 17 percent of their original size and competitive satellite rates are available through service providers.

Circle 3 on Reader Service Card

AutoChief C20 Reports Good Market Penetration

The future is now for Kongsberg, and its futuristic looking AutoChief C20 propulsion control system. First announced at Nor-Shipping 2003, it has received a good deal of attention and, more importantly, early orders. By reducing the amount of buttons and controls on the panel itself, operation of the propulsion control system has been simplified, leaving crewmembers to concentrate on more complex actions.

AutoChief C20 is actually the fifth generation AutoChief, with the first AutoChief appearing in 1967. **Ole Gunnar Hvam**, VP Navigation and Automation said, "We will follow the AutoChief closely and listen to feedback from the users before we commit to the direction of the design of our other bridge equipment." The design is proving popular already though, with the Norwegian Design Council recently awarding the AutoChief C20 a sought after design award, stating that it is, "A consistent and complete control panel for larger ships where the functionality is considerably simplified and improved. The pure visual design is intuitive, it has good tactility and feedback to the user. This is a professional and uncluttered product of high quality, with good aesthetics and high durability."



Circle 49 on Reader Service Card

SAM Electronics Advances Bridge Automation

Current developments from Hamburg-based SAM Electronics include its series of Ship Control Centers (SCC) which typically combine and automate all main bridge equipment operating functions inclusive of navigation, communications, engine control and alarm monitoring. Using standardized consoles, systems basically centralize all ship management information with commonality of interfaces and data as well as instant redundancy in the event of any sub-assembly failure. They are primarily designed to meet so-called one-stop shopping requirements, with particularly strong sales to South Korean yards.

To date, nearly 200 SCC's have been ordered worldwide. Among latest commissionings is a system for Pride of America, the new 81,000-gt 281m cruiseliner presently being constructed by Lloyd Werft Bremerhaven for NCL as part of its Project America 1 undertaking following NCL's acquisition last year of the vessel's partially completed hull built by Ingalls Shipyard in the US. The system is to incorporate a NACOS 65-4 navigation command system while SAM Electronics will also provide the vessel with cabling, electrical distribution, lighting equipment and other facilities.

Pride of America, whose existing hull is being lengthened by Lloyd Werft by around a further 25m, is due to be completed in April of next year. It will be the first new ocean-going passenger vessel in nearly 50 years to sail under the US flag, beginning service in Hawaii.

Circle 51 on Reader Service Card

Vision FT IBS

Late last year in Amsterdam Sperry Marine rolled out its vision of the bridge of the future.

The Vision FT integrated bridge system (IBS) incorporates the latest advances in marine navigation technology and combines all of the ship's navigation sensors and systems — including radars, electronic chart display and information system, gyrocompass, depth sounder, speed log, DGPS receivers and autopilot — into a completely integrated package.

Central to the system is Sperry Marine's Voyage Management System (VMS) software, which is designed to provide easy and precise route planning and gives a clear real-time picture of the ship's precise position and movement, along with radar targets and automatic identification system data, on an electronic chart display and information system. "In the future, I believe the main navigation display will be an electronic chart with a Radar and AIS overlay," said Capt. **Jan T. Hansen**, the company's director of system sales worldwide. This reality is dependent, however, on the availability of electronic chart data.

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

The new bridge console designs have been optimized for modern large-screen high-resolution flat-panel color displays, with easy front-panel access for maintenance and repairs. The man-machine interface has been upgraded with a new ergonomic trackball control device and drop-down menu windows for easy operation minimizing the need for operator training. Another interesting offering is the PocketBridge, a remote wireless multi-function handheld device that is designed to allow for the ship's master and officers to view data from the IBS and other ship systems on a palm-type computer anywhere on the ship.

Circle 50 on Reader Service Card

This directory is the result of an e-mail survey conducted in April 2004. Send additions or deletions to mren@marinelink.com. Publisher assumes no responsibility for errors or omissions.

A

ACR Electronics, Inc.
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Fort Lauderdale, FL 33312
Tel: (954) 981-3333
Fax: (954) 983-5087
Tony Smith
www.acrelectronics.com
E-Mail. tsmith@acrelectronics.com

AGMarine, Inc.
5009 Pacific Highway East Suite 11
Tacoma, WA 98424
www.agmarine.com
Devon Liles
Tel: 253-926-1948
Fax: 253-926-2244
E-mail:devonl@agmarine.com

Autonav
2637 Rogate Ave.
Coquitlam, BC V3K 5S3 Canada
www.autonav.com
Tel: 604-526-0113
Fax: 604-526-0146
E-mail:wagner@autonav.com
Products: Dynamic Positioning, Autopilots, Automation Systems, Steering Systems

Azonix Corp.
10528 Meadowglen Lane
Houston, TX 77042
www.azonix.com
Ed Kelleher
Tel: 508 428.7774
Fax: 508.428.7547
E-mail:ekelleher@dynalco.com
Descr: A designer and manufacturer of ruggedized PCs and data-acquisition systems for severe industrial applications where other compatible systems cannot survive.
Products: Displays & Monitor

B

Beier Radio
2605 N Concord Rd
Belle Chasse, LA 70037
www.BeierRadio.com
Betty Bates
Tel: 504-341-0123
Fax: 504-348-2007
E-mail:BeierSales@aol.com
Descr: Founded in 1945 Beier Radio specializes in design, manufacture, installation and repair of shipboard electronic systems and equipment
Products: Dynamic Posistioning systems, Integrated Vessel Control Systems, Equipment Monitoring and Control systems, Engine Controls, Tihruster Controls, Steering Systems, GMDSS, Radar,

Boatracs
1935 Cordell Court
San Diego, CA 92020
www.boatracs.com
Mary-Ann Courtenaye
Tel: 619-438-6000
Fax: 619-438-6068
E-mail:info@boatracs.com
Descr: Premier provider of wireless maritime information solutions
Products: Cargo Security, Cargo Tracking, Communications, GPS, SaTel:lite Communication, Software

Buffalo Computer Graphics
3741 Lake Shore Road
Blasdell, NY 14219
www.buffalocomputergraphics.com
David Todd
Tel: 716-822-8668
Fax: 716-822-2730
E-mail:dtodd@buffalocomputergraphics.com
Descr: Maritime Simulation
Products: Radar Simulators, ECDIS Simulators, Communication Simulators, GMDSS Simulators

C

CAE Inc.
8585 Cote de Liesse
Montreal, QC H4T 1G6 Canada
www.cae.com
Steven Geller
Tel: 514-341-2000
Fax: 514-340-5571
E-mail:steven@cae.com
Descr: Control systems
Products: Electric & control Systes

C-MAP/Commercial
133 Falmouth Road
Mashpee, MA 12649
www.c-map.com
Eric James
Tel: 5084777537
Fax: 5085394384
E-mail:commercial@c-map.com
Descr: Electronic Charts
Products: CM-93, OceanView

Comark Marine
93 West Street
Medfield, MA 02052
www.comarkcorp.com
Jennifer MacKay
Tel: 508-359-8161
Fax: 508-359-2267
E-mail:sales@comarkcorp.com
Descr: Manufacturer of Marine Computer and High-Bright Displays for rugged shipboard applications
Products: 8700 Series Marine PC; 8801/8803 High Bright Displays; 8429 NEMA 4 Waterproof Keyboard; 8240 I/O Server; Expeditions - Ship Systems Monitoring Software

Comnav
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Richmond, BC
Canada V6V 2G1
Tel: (604) 207-1600
Fax: (604) 207-8008
Dan Pantages
www.comnavmarine.com
E-mail: pantages@comnav.com

D

Data Modul, Inc.
1767-46 Veterans Memorial Highway
Islandia, New York 11749
Tel: (631) 951-0800
Fax: (631) 951-2121
E-mail: amulrain@DataModul.com
www.datamodul.com
Products: Monitors & Displays

DataStar Marine Products Inc.
839 - D West 1st. Street
North Vancouver, BC V7P 1A4 Canada
www.DataStarMarine.com
Richard Simpson
Tel: 604.990.6900
Fax: 604.990.6890
E-mail:crichey@datastarmarine.com
Descr: Manufacturer of Vessel Monitoring, Automation, Alarm and Control systems and flat panel touch screen displays and marine PCs.

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P.O. Box 1150
Kinder, LA 70648
www.datrex.com
Kevin Tyler
Tel: 800 828 1131
Fax: 337 738 5675
E-mail:sales@datrex.com
Descr: Safety product manufacturer and distrubutor
Products: GMDSS

Digital Imaging Infrared
174 Semoran Commerce place, Suite 111
Apopka, FL 32703
www.dii-llc.com
Dave Norman
Tel: 407-884-0202
Fax: 407-884-8282
E-mail:dnorman@dii-llc.com
Descr: Digital Imaging Infrared is a global provider of high-performance FLIR (Forward Looking Infrared) cameras and thermal imaging systems.
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Rahway, NJ 07065
www.emsmarcon.com
Tel: 732 382 4344
Fax: 732 388 5111
E-mail:emsmarcon@aol.com
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Products: ABS and USCG ApprovedTank Radar, Overfill/High Level Detectors, Level and Pressure Sensors

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6125 W. Sam Houston Pkwy N., Ste 406
Houston, TX 77041
www.electrowaveusa.com
Martin L. Kershman
Tel: 713-896-7799
Fax: 713-896-7722
E-mail:kershman@pdq.net
Descr: Drilling & Marine Integrated Monitoring & Control Systems
Products: Machinery Plant Control & Monitoring Systems, Ballast / Tank\Gauging / Integrated CCTV, Marine Advisory Systems / Drilling Instrumentation

ELNA Elektro-Navigation und Industrie GmbH
Siemensstrasse 35
Rellingen, 25462 Germany
www.elna.de
Wolfgang Grube
Tel: ++49 4101 301 00
Fax: ++49 4101 301 214
E-mail:info@elna.de
Descr: distributor of ships electronic equipment
Products: AIS, Alarms, Autopilot, Battery Chargers, Cameras/Night Vision, Cargo Monitoring, Closed Circuit TV, Communications, Displays & Monitors, Electric & control Systesm, GMDSS, GPS, Integrated Bridge Systems, Navigation Equipment, Radar/ARPA, Radio, SaTel:lite Communication, Voyage Data Recorder

E

Eurocom Industries A/S
E-mail: ecl@eci.dk
www.eci.dk

F

FarSounder, Inc.
95 Hathaway Center Suite 5
Providence, RI 02907
www.farsounder.com
Cheryl M. Zimmerman, CEO
Tel: 401-784-6700
Fax: 401-784-6708
E-mail:cheryl zimmerman@farsounder.com
Descr: Manufacturers of Real-time 3 Dimensional Forward Looking Sonar for Navigation and Obstacle Avoidance
Products: Navigation Equipment, Software

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16505 SW 72ND AVE.
PORTLAND, OR 97224
PHONE: 503 372-6000
FAX: 503 684-3207
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WWW.FLIR.COM
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Products: Mobile Satellite Communications

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Camas, WA 98683
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Fax: 360-834-9400
E-mail:info@furuno.com
Descr: Marine Electronics Manufacturer
Products: AIS, Autopilot, Communications, GMDSS, GPS, Integrated Bridge Systems, Navigation Equipment, Radar/ARPA, Radio, SaTel:lite Communication

G

Globalstar
www.globalstar.com
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H

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www.hatteland.com
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Descr: Global Communication and Electronic Equipment and Service Provider.
Products: Radio, SaTel:lite, Inmarsat,

Marine Electronics Guide

Globalstar, Iridium, VSAT, Electronics,Voice, Data, Fax, Video, SCADA.

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Fax: 850-434-1246
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Descr: Manufacturers of tank level gauging and high level alarms for tanker ships and barges. Cargo monitoring sytems. Water ingress alarms for bulk carriers.
Products: Alarms, Ballast Control, Cargo Monitoring

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Jacksonville, FL 32207
www.ipsswitchgear.com
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E-mail:glenn@ipsjax.com
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WWW.INMARSAT.COM
DESCR: Satellite COMMUNICATIONS

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Discovery Drive, Arnhall Business Park
Aberdeen, AB32 6FG UK
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Paul Barry
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Fax: +44 1224 428401
E-mail:enquiries@invsat.com
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Products: AIS, Cameras/Night Vision, Closed Circuit TV, Communications, Displays & Monitors, Electric & control Systesm, GMDSS, GPS, Infrared Imaging Equipment, Navigation Equipment, Radar/ARPA, Radio, SaTel:lite Communication

J

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Seattle, WA 98134
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Descr: Marine Electronics Manufacturer
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Fax: +44 20 8500 0837
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Rochester, ME1 3QL UK
www.kme.co.uk
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E-mail:gwright@kme.co.uk
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Products: TracVision Satellite TV, Tracphone Satellite communications, TracNet, eTrac Ships Security Alert System (SSAS)

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FAX: (941) 377-5591
EMAIL: ALINA.CEMITIER@L-3COM.COM
WWW.L-3AR.COM
DESCR: AIS, VDR (HVR), GMDSS, DSC VHF RADIOS, CONTAINER SCANNING

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www.L-3Klein.com
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FAX: 315-456-0766
EMAIL: MARK.WESEL@LMCO.COM
DESCR: MARITIME SAFETY, SECURITY AND SURVEILLANCE SYSTEMS

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Delray Beach, FL 33496
www.mcmpw.com
James Chandler
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Fax: 561 819 2650
E-mail:sales@mcmpw.com
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MMC International Corp.
60 Inip Drive
Inwood, NY 11096
www.mmcintl.com
Charles Elder
Te : 516-239-7339
Fax: 516-371-3134
E-mail:mmcinwd@aol.com
Descr: Equipment Manufacturer
Products: Portable Electronic Tank Gauging Systems

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23858 HEWTHORNE BLVD, SUITE 200
TORRANCE, CA 90505
PHONE: 310-791-8213
FAX: 310-791-6108
WWW.MX-MARINE.COM
DESCR: AIS MONITOING STATION SYSTEM

N

Nauticast AG
Mariahilfer Str. 50/2/11
Vienna, Austria
www.nauticast.com
Alfred Hofer
Tel: +43/1/5 237 237 - 0
Fax: +43/1/5 237 237 - 150
E-mail:alfred.hofer@nauticast.com
Descr: The AIS Company
Products: AIS

Navionics Inc
6 Thatcher Lane
Wareham, MA 02571
www.navionics.com
Susan James
Tel: 508-291-6000
Fax: 508-291-6006
E-mail:sales@navionics.com
Descr: Electronic Vector Charts for Offshore Fishing and Cruising, and Freshwater Lake Fishing
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IRVING, TEXAS 75060
PHONE: 186 NIGHTNAV
FAX: 972-554-3965
EMAIL: CPRATHER@NIGHTNAV.COM
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HORTEN, N- 3194 NORWAY
PHONE: +47 33 08 48 00
FAX: +47 33 04 57 35
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DESCR: VTS VTMIS VESSEL TRAFFIC MANAGEMENT AND INFORMATION SYSTEMS FOR PORTS/HARBOURS, COASTAL AREAS AND OFFSHORE INSTALLATIONS AIS SOLUTIONS AND AIS NETWORKS.

North American Video
301 Drum Point Road
Brick, NJ 08723
www.navcctv.com
Cynthia Freschi
Tel: 732-477-0686
Fax: 732-477-0886
E-mail:info@navcctv.com
Descr: Systems Integration
Products: Systems Integration

O

Observation Technologies
136 Railroad Drive
Ivyland, Pa 18974
www.obstek.com
Michael Palmer
Tel: 215-322-5441
Fax: 215-322-5463
E-mail:mpalmerinc@aol.com
Descr: radar/AIS/Video/sensor integrators
Products: radar and sensor systems and integration

R

Radio Holland Inc
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radiohollandusa.com
Michael Kellner
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Fax: 908.298.9118
E-mail:mikekellner@radiohollandusa.com
Descr: International Sales & Service Commercial
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Suite 1140, 300 Oak Street
Pembroke, MA 02359
www.radio-at-sea.com
Peter Gruol
Tel: 781-829-6556
Fax: 978-829-0478
E-mail:info@radio-at-sea.com
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Products: Satellite Communication

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22 Pearl Place, P.O. Box 427
St-John's, NL A1C5K4 Canada
www.ruttertech.com
Gerald F. Olscamp,P.Eng
Tel: 709-368-4213
Fax: 709-368-1337
E-mail:golscamp@ruttertech.com
Descr: World's leading VDR Manufacturer
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S

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Gothenburg, SE-402 51 Sweden
www.saabrosemount.com
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Fax: +46 31 25 30 22
E-mail:sales.srm@emersonprocess.com
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www.sam-electronics.de
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Fax: +49 (0)40 8825 4022
E-mail:ulrich.roehrl@sam-electronics.de
Descr: SAM Electronics is one of the leading manufacturers of automation, propulsion, energy distribution and navigation and communication systems for all types of seagoing vessels
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MOUNTLAKE TERRACE, WA 98043
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FAX: 425-771-2650
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WEB SITE: HTTP://WWW.SEA-DMI.COM
DESCR: FULL LINE OF VHF, HF, GMDSS AND AIS PRODUCTS

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Jacksonville, FL 32202
www.seaserve.com
Art Thomas, Sr.
Tel: (904) 355-0343
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E-mail:sales@seaserve.com
Descr: Marine Electronics
Products: IBS, VDR, AIS, GMDSS communication and navigation systems

Seagull Maritime Information Technology
Suite 200, 1311 Howe St.
Vancouver, BC V6Z2P3 Canada
www.sgull.com & www.seagullmaritime.com
Jennifer Mawby
Tel: 604-691-1791
E-mail:Jennifer.Mawby@sgull.com
Descr: Computer-based training and systems for the maritime industry
Products: Computer-based training, the Onboard Library, Onboard Security Trainining, Seagull Training Administrator

SIDUS SOLUTIONS, INC.
P.O. BOX 60767
SAN DIEGO, CA 92166
PHONE: 619 275-5533
FAX: 619 275-5544
EMAIL: INFO@SIDUS-SOLUTIONS.COM
WWW.SIDUS-SOLUTIONS.COM
DESCR: HAZARDOUS AREA & SUBSEA CCTV SYSTEMS, ALARM & MONITORING

SIMRAD, Inc.
19210 33rd Avenue West
Lynnwood, WA 98036
www.simrad.com
John Caballero
Tel: 425-778-8821
E-mail:info@simradusa.com
Descr: Marine Electronics
Products: AIS, Alarms, Autopilot, Closed Circuit TV, Communications, Displays & Monitors, Electric & control Systesm, GMDSS, GPS, Navigation Equipment, Radar/ARPA, Radio, SaTel:lite Communication, Simulation

Seawave
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Aquidneck Corporate Park
Middletown, Rhode Island 02842
Tel: 800.746.6251
info@seawave.com
www.seawave.com
Descr: SeaWave offers reliable, low cost and integrated marine communication solutions using state-of-the-art hardware and software. SeaWave communication systems offer near zero administration and put the user in control of communication costs.

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Fax: +1 973 830 2200
www.smithsdetection.com
E-Mail: usinfo@smithsdetection.com

Singapore Telecommunications Limited
15 Hill Street Singapore 179352
www.singTel:.com/sentosaLES
Ang Kim Soon
Tel: (65)63316766
Fax: (65)63346110
E-mail:kimsoon@singTel:.com
Descr: Mobile Satellite Service Provider
Products: Satellite Communication

Sperry Marine, A Unit of Northrop Grumman Systems
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Charlottesville, va 22901-2891
www.sperry-marine.com
Carlis Halfant
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T

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Rockville, MD 20852
Tel: +301 838 7805
Fax: +301 838 7832
E-mail: Thomas.Surface@Telenor-usa.com
www.telenor.com/satellite
Descr: Satellite communications for the maritime, land mobile and aeronautical industries.

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Lundtoftegaardsvej 93 D
Kgs. Lyngby, 2800 Denmark
www.tt.dk
Monika Gram Ritter
Tel: +45 39 55 88 00
Fax: +45 39 55 88 00
E-mail:info@tt.dk
Descr: Thrane & Thrane develops and markets equipment for mobile saTel:lite communication within the elements of water, land and air. Thrane & Thrane offers a comprehensive range of satellite communication products for numerous maritime applications.
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www.delticgroup.com/marine.htm
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Fax: (905) 339 0769
E-mail:info@delticgroup.com
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Products: Alarms, Ballast Control, Cargo Monitoring, Cargo Security, Cargo Tracking, Voyage Data Recorder

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Products: Integrated Bridge Systems, Navigation Equipment, Simulation, Software

V

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E-mail:info@videoray.com
Descr: Micro ROV manufacturer
Products: Cameras/Night Vision, Cargo Security

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X

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www.xantic.net
Tel: +31 70 343 4543
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Descr: Xantic is the result of a merger between Station 12, SpecTec, Telstra Global Satellite and KPN Broadcast. Xantic offers an unrivalled portfolio of Satellite communications and AMOS software solutions.
Products: Xantic offers all Inmarsat services in all ocean regions, as well as a range of value added services. AMOS offers a range of software products for the maritime industry.

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www.xenex.com
Descr: A manufacturer of PC-based radar interface systm and displays for marine and surveillarnce applications.

Z

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Descr: On-board Communication Systems
Products: Alarms, Communications, Integrated Bridge System

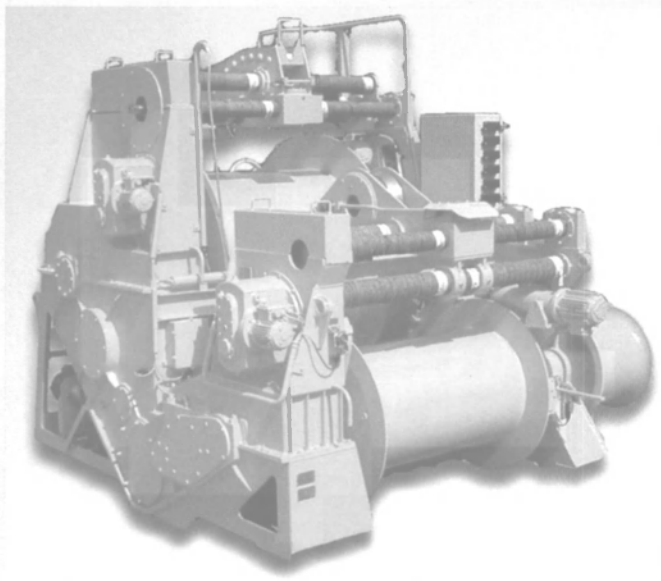
Research Winches for R/V Maria S. Merian

Seven special winches were supplied by Hatlapa in December 2003 after being tested and demonstrated in the factory. These winches are intended for the new research vessel Maria S. Merian, which will support the vessel Polarstern during operations in the Arctic.

Hatlapa has escorted this project for five years, during which time the design of the winches was formed in close cooperation with the order principal BAW (Bundesanstalt fur Wasserbau) and the shipyard Krogerwerft in Rendsburg.

One specialty is the combination of friction and storage winch for handling the very long and relatively thin measuring cables. The advantage is that the sensitive and expensive research ropes can be spooled on the storage winch free from load. The pull is created in the friction part and exerted via several grooved drums to protect the rope. A spooling device which has been developed and patented by Hatlapa also guarantees that the rope is wound onto the storage winch in a clean and gentle manner. Thereby the crossing of rope layers resulting in rope breakages are avoided. The storage winches have a very large drum diameter for realizing low bending radii of rope when wound on for protecting the sensitive measuring wires in the ropes.

As already mentioned, the ropes are not just normal synthetic or steel wire rope, but consist of a single cable with an outer coating of synthetic material to protect the conductor against damage, to guarantee the necessary shielding, and to absorb the forces. Constant communication is possible between the control and measuring instruments by transmission rings in the winch, also during paying-out and hauling-in the rope. Furthermore, lighting conductor cables are in use which have a similar structure, allowing also constant communication between the control and measuring instruments.



By using frequency inverter controlled motors the speed can be infinitely variably controlled and the winches operated absolutely synchronously. The otherwise usual maximum demands on the shipboard power supply, the ropes and mechanics are eliminated, because the winches are on standby from zero speed to full torque, thus allowing a smooth start. The electric driving capacity of each winch is up to 352 kW that is produced by four motors of each 88 kW. By using four motors capacity reserves are increased on the one hand, and on the other hand the distribution of the load into the gear allows a compact construction. To dissipate the heat arising in the electric motors water cooling has been provided, contrary to the usual air cooling.

Circle 27 on Reader Service Card

Konecranes Giving Port Efficiency a Lift

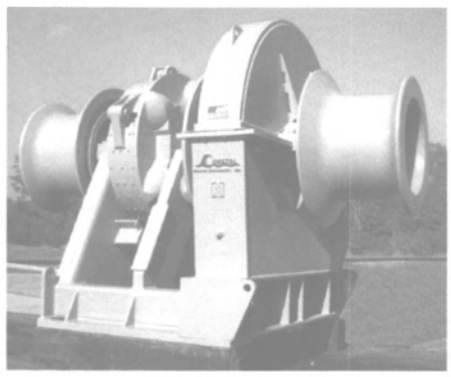
Barbours Cut Terminal recently purchased 10 "super" cranes, and the Port Commission has approved five more. The original 10 cranes replace - and outperform - six older cranes that Barbours Cut had used. "In the first few months, we've gained efficiency and capacity," said **Jeff Davis**, container operations manager at Barbours Cut. "The Konecranes are more reliable, and they possess a greater hoist speed." The Konecranes were delivered in two shipments in January and March. The first live were operational by March and the subsequent five went online in May. The six older cranes were retired one at a time as the new Konecranes came online.

"These cranes can lift containers faster plus they move at a trolley speed," Davis said. "The wheel turns are a dramatic improvement; these wheels flip and go, creating a more efficient use of time." Davis explained that the new cranes have also reduced the amount of time it takes to process incoming and outgoing trucker loads at Barbours Cut. The average truck turn time used to range well over an hour. These days, it's down to just under an hour.

"The less time a truck spends at the terminal, the quicker it can get on the road and deliver its cargo," Davis said. "The 10 minutes we have gained in the first six months means real dollars to our customers. And I expect we'll experience more time efficiency once we receive the next shipment of five cranes next year." The Konecranes are able to stack containers four high compared to the retired models, which could only stack three. That increase in height saves precious yard space at the capacity-strained container terminal. **Paulo Soares**, maintenance superintendent at Barbours Cut, traveled to Finland to visit the Konecrane manufacturing facility during the procurement process. He said that he was very impressed with everything he learned during that trip.

Circle 28 on Reader Service Card

Coastal Marine Wins ATB Contract



Coastal Marine Equipment. Inc. won a contract to provide the deck machinery for the Penn Maritime ATB being constructed at Bay Shipbuilding. Equipment for the 140,000 barrel barge includes the 2-3/16-in. stud link anchor windlass with soft rope mooring drum; three double drum wire rope mooring winches; and three 24-in. mooring capstans. All equipment is electrically driven and provided with variable frequency drives for multi-

ple speed operation. The tug will be fitted with a 36-in. hydraulic capstan and 60-hp electro-hydraulic power unit. Coastal Marine Equipment offers a complete line of marine deck machinery, engineering and design, as well as general fabrication, precision and general machining, testing, installation, maintenance and repair services.

Circle 24 on Reader Service Card

Markey for Alaska Ferry

Markey Machinery completed the supply of deck machinery for the new State of Alaska Ferry Lituya, under construction at Conrad Shipyards. The set of equipment includes two Markey type CEW-50 10 hp Electric Capstans, and one Markey type WEW-20 20 hp Electric Anchor Windlass for 1.25-in. anchor chain. The system features two-speed electric drives providing a wide range of performance, and marine design electrical equipment to withstand the rigors of operation in northern Alaska waters.

Circle 25 on Reader Service Card

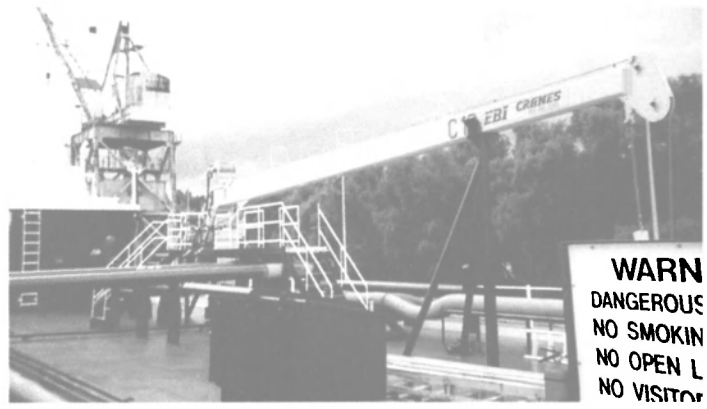
Intercon Continues to Notch ATB Success

While the market for articulated tug barges has slowed following strong activity in 2003, one of the leading names in the business, Intercon, continues to report success. Island Tug & Barge Ltd. of Vancouver, BC commissioned the barge, Island Trader, in Vancouver. The barge was built in China and returned to Vancouver by tug, Island Monarch. The 3,000 hp tug was retrofitted with an Intercon C-Series Coupler and the barge notch was fitted with Intercon ladder assemblies. The C-Series Coupler is the latest addition to Intercon's product line of articulated tug-barge couplers, sized for ATBs in the 60,000 to 100,000 BBL range.

Penn Maritime of Staten Island, New York ordered its fifth ATB to be outfitted with an Intercon 50-in. Coupler System. The 123-ft., 6,000-hp tug and 140,000-BBL barge will be built by Bay Shipbuilding of Sturgeon Bay, Wis.

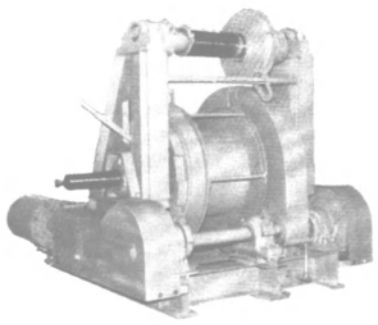
Circle 59 on Reader Service Card

Techcrane Global Provides Hose Handling Cranes



As OPA takes effect, companies are refurbishing old or building new vessels to comply with double hull requirements. Currently Techcrane is a supplier of hose handling cranes for most major fuel transport companies with their projects being completed at various shipyards along the Gulf and around the U.S. The cranes are being tailor made to accommodate various requirements such as multi product handling, multi point lifting and a special emergency payout system to help prevent inadvertent damage to the boom. The cranes range in capacity from 2.5 tons to 50 tons and are installed one on each side of the vessel or one in the centerline of the ship servicing port and starboard.

Circle 45 on Reader Service Card



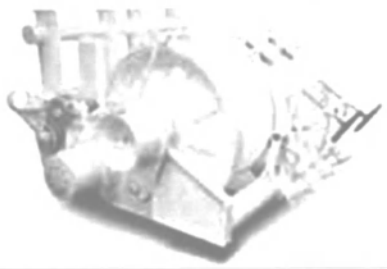
SLM Corp. Uses New Winch Drive System

Superior Lidgerwood Mundy (SLM) Corp. has added yet another drive system to its already potent arsenal. In addition to hydraulic, electro-hydraulic, and standard electric drives, SLM has now incorporated a vector drive system control into its winch design. This vector drive system control provides for infinite speed control with maximum line pull at any speed range. In addition, this system provides for full load stall, and no noise during operation.

Circle 63 on Reader Service Card

Burrard Iron Works Delivers

Burrard Iron Works Limited has been manufacturing, supplying and servicing engine room and deck machinery for the shipping industry since 1912. The company's heavy duty winches, windlasses and capstans are custom designed for each application, so that they meet the strenuous and diverse requirements of deep sea towboats, arctic supply vessels, sheltered water passenger ferries, cargo ships and tankers. Pictured is the Burrard HJD Double Drum Tow Winch, which carries 2,200 ft. of two-in. wire on one drum, and 2,000 ft. of 2.25-in. wire on the other. It has a mid-drum pull of 45,000 lbs. at 62 ft. per minute, light line at 125 ft. per minute.



Circle 29 on Reader Service Card

Nabrico Offers Vast Line

Nabrico, with more than 100 years of service and known for its manual and powered 5- to 60-ton deck and constant-tension positioning winches, expanded its deck machinery product line. Now offering anchor windlasses and anchor winches, together with mooring winches and capstans, Nabrico is serving the marine equipment needs of the offshore barge and tug industry as well as the inland marine industry. Complete deck machinery packages have already been supplied to a number of operators of ocean-classed barges. Nabrico winches, capstans, oil cargo dome hatches and doors are also at work on the blue water.

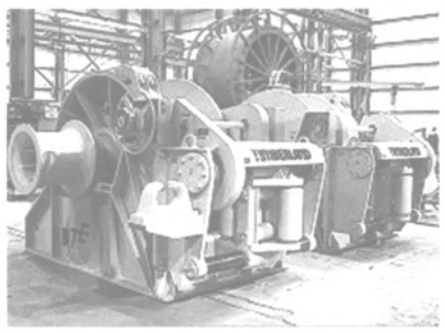
Nabrico also makes a full line of mooring, anchoring, towing and deck winches, both manual and power, barge moving winch systems, hatches (including quick-acting models), watertight doors, expansion turnks and castings.

Circle 60 on Reader Service Card

Timberland Services Workboat Market

From workboat equipment to offshore equipment, Timberland Equipment & Almon Johnson have a wide variety of marine equipment. Timberland Equipment & Almon Johnson provide a wide range of Winches for escort and ship assist applications, products which feature: Single or double drum configurations; Braking capacities up to 1,000,000 lbs. (448,000 daN); Superior control and abort systems; Gypsy heads; Hydraulic, Diesel or Electric drives; variable line-pull ratings to meet a specific customer's needs; and Optional Levelwind systems.

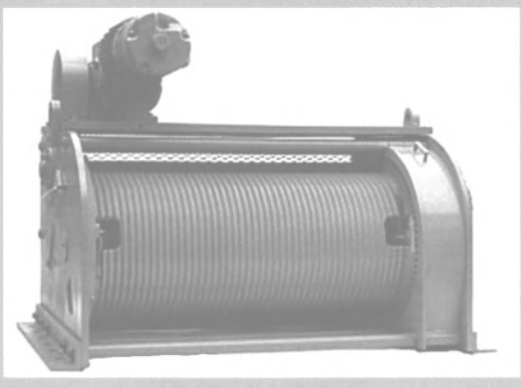
Circle 30 on Reader Service Card



Series 651A Hawser Winch

Max. brake holding	300,000 lbs. (136,000 daN)
Max. linepull	8,000 lbs. (3,628 daN)
Max. linespeed	230 fpm (70 m/min)
Drum capacity600 ft. of 7-in. circ. Hawser (140 m of 178 mm circ.)	
Levelwind	Automatic diamond leadscrew
Drum band brake	Variable control

W.W. Patterson: Specializing in Heavy Duty



W.W. Patterson offers a number of deck machinery products for the marine business, boasting quality built for heavy duty cycles and reduced maintenance, and galvanized to withstand the harsh saltwater environment. Pictured is a barge haul winch, available in four models of varying pull capabilities. Each barge haul winch offers these features and options: W. W. Patterson's design — quality built for of operation and reduced maintenance; Extra-long drum for increased rope capacity; Thermostatically protected motor; Extra-wide gearing for high duty cycle; Large-diameter shafts for more even gear wear; Special high-inertia brake disks resist wear and heat build up caused by constant start and stop operation; Easy-access rope clip for rope installation; High-capacity roller bearing on high-speed shaft for reduced maintenance; Options include groove drum, radio controls, saltwater corrosion protection and angle foot mounts; and NEMA 4 control panel and remote push buttons available.

Circle 31 on Reader Service Card

Rapp Hydema Finds Success in Russia

Rapp Hydema U.S. recently supplied another third-wire winch - the SOW-300 - that marks the seventh this year for the popular model. For U.S. vessel operators, the winch has been long known; more recently, however, Russian Far East firms-working through Seattle management companies-have also discovered the merits of the sturdy, user-friendly design. The first such Russian Far East customer was the F/V Tosno (Vladivostok) in 1997, but activity has moved north since then. So both Kamchatka and Sakhalin firms have recently added their names to the list of customers, including for the latter Gidrostroi, working through Polar Bear Seafoods (Seattle, WA).

Circle 62 on Reader Service Card

Lankhorst Ropes Delivers Stength

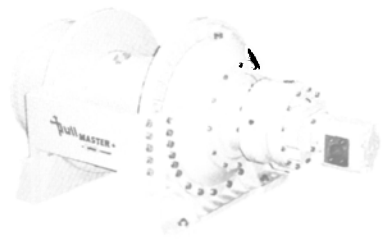
A benchmark which is increasingly being used to measure the performance of ropes in the maritime industry is TCLL (Thousand Cycle Load Limit) value. TCLL expresses the maximum percentage of the nominal breaking strength at which a rope can be cycle loaded 1,000 times as tested under strict laboratory conditions. Simplified, TCLL expresses the rope's resistance against tension-tension fatigue. The higher the TCLL value expressed as a percentage, the higher the resistance against cycle loads. The TCLL value originates from OCIMF (Oil Companies International Marine Forum) guidelines for SPM mooring hawsers. The OCIMF only issues the guidelines. In order for them to be certified, an independent inspector from a recognized classification society must witness and verify the test. Lankhorst Ropes Euroflex rope recorded a certified 80% value while Tipto Eight was observed to achieve 71%.

Circle 26 on Reader Service Card

Pullmaster

Pullmaster recently unveiled the M75 Equal Speed / H75 Rapid Reverse, a high performance, high efficiency planetary winch design, with a spring applied hydraulically released static/dynamic brake, exceptionally smooth lowering control and an oil bath enclosed, designed to provide long, trouble-free service.

Circle 61 on Reader Service Card



Stolt Offshore Settles Patent Dispute

Stolt Offshore S.A. announced that its long running U.K. litigation with a competitor regarding a European patent covering technology related to the laying of flexible pipes has been settled out of court. The settlement involves a cash payment by Stolt Offshore in respect of past patent infringements and the granting of a license under the disputed patent covering the North Sea area. The settlement will not have a material impact on the company's results for 2004. Tom Ehret, CEO of Stolt Offshore, said, "The satisfactory resolution of the this patent infringement action marks significant progress in our settlement of long outstanding disputes."

Chinese Yard Logs Strong Month

As high freight rates continue, Shanghai's Huarun Dadong Dockyard (HRDD) is undergoing a busy period with a total of 12 vessels being repaired in January and 13 vessels in February. This is a 10 percent increase of production value in the first two months compared with 2003, and a 25 percent increase during February. There are also bookings as far ahead as May this year, a very unusual situation for this yard. A total of 90 percent of the vessels repaired in February are from Asia countries and regions, such as Japan, Taiwan, Hong Kong, and China. Included in the figures for February are three vessels from Japan - First Marine's 48,913 dwt bulk carrier Crystal Lily, Nippon Kaiun's 68,621 dwt bulk carrier Sunny Ocean, and Osaka Rosex Shipping's 47,348 dwt container carrier Newport Bridge, three vessels from Taiwan's TMT - the 75,594 dwt bulk carrier Capaz Duckling, the 41,639 dwt wood chip carrier Prince of Ocean, and the 70,681 dwt tanker King Duckling, and two vessels from Hong Kong's Glory Shipping - the 45,222 dwt bulk carrier Lucky Marine, and the 41,061 dwt bulk carrier Top Glory. Other ship repaired during February include IMC Shipping's 29,135 dwt bulk carrier Maritime Friendship, Totis Marine's 40,846 dwt bulk carrier Kallisto, and, from the domestic market, Shanghai Pu Yuan Shipping's 25,887 dwt bulk carrier Yun Ling.

Smedvig Secures $167m Contract

Smedvig has been awarded a letter of intent by A/S Norske Shell for the assignment of the deepwater drillship West Navigator on the Ormen Lange field in the Norwegian Sea. The assignment includes drilling of eight deepwater wells in approximately 900 m of water, with options for four additional wells. The contract value for the firm part of the contract is estimated to $167 million.

NME to Distribute Dolphin Fenders

Norwegian Maritime Equipment AS (NME) has been appointed exclusive distributor of Dolphin pneumatic and port fenders in most European countries, as well as in Brazil, Canada and USA.

Circle 4 on Reader Service Card

Becker U.K. Moves Office

Becker Marine Systems U.K. relocated from their original office in Fleets Corner to Wallisdown, Poole. The new address is: Becker Marine Systems, Discovery Court Business Centre, 551-553 Wallisdown Road, Poole, Dorset, BH12 5AG. England; Tel: +44 (0) 1202 853170; Fax: +44 (0) 1202 853171; Info-uk@becker-marine-systems, www.becker-marine-systems.com.

Radio Holland Opens Malaysia Office

Radio Holland Group opened a new office in Malaysia on February 26, 2004, the 49th branch office of the Radio Holland Group, and the company's response to the increasing marine activities in Malaysia and specifically in the Port of Tanjung Pelepas, which had another record-breaking year in 2003 with an annual throughput of almost 3.5 million TEU. The address is: Radio Holland Malaysia Sdn Bhd, (Pusat Latihan Kebakaran), Jalan Pukal , Johor Port, 81750 Pasir Gudang.

Competition for $628M FPSO Heats Up

Jurong Shipyard Ltd's (JSL) Brazilian subsidiary, Maua Jurong has emerged as the frontrunner for a $628m contact to construct a Floating Production Storage and offloading (FPSO) vessel for Brazilian oil giant Petrobras. It is expected that the work will be divided between the Brazilian yard and Singapore. JSL, along with Sembawang Shipyard, are both part of Singapore's SembCorp Group. Jurong's $628m bid was the lowest of four bids submitted for the project to convert the272,631 dwt, 1979-built Petrobras VLCC Barao del Maua into a 180,000 bpd FPSO to work in the state-owned oil giant's Roncado field, part of the Campos Basin. Bids from rival consortia including Fels Setal/Technip, Andrade Gutierrez and Queiroz Galvao/ Dragados, were all substantially higher.

Euronav, Partners Buy World's Largest Tankers

Euronav, the tanker subsidiary of the CMB group, together with partners have reached an agreement for the acquisition of four double hull 'V plus' ships (also known as Ultra Large Crude Carriers) of 442,500 dwt. The vessels are: Hellespont Alhambra, Hellespont Tara, Hellespont Fairfax and Hellespont Metropolis. The ships will be delivered in the course of the months of May and June 2004 and will be renamed: TI Asia, TI Europe, TI America and TI Africa.

Fuel Oil Separation Takes Center Stage

While maritime security concerns are most assuredly the number one item topping marine vessel owner's agendas, environmental matters rank a close second. Port state authorities around the globe regularly levy millions of dollars in fines for illegal dumping and accidental spills, and the marine industry is under the microscope of public opinion, as vessel operations are scrutinized like never before.

Microscopic is a very good word.

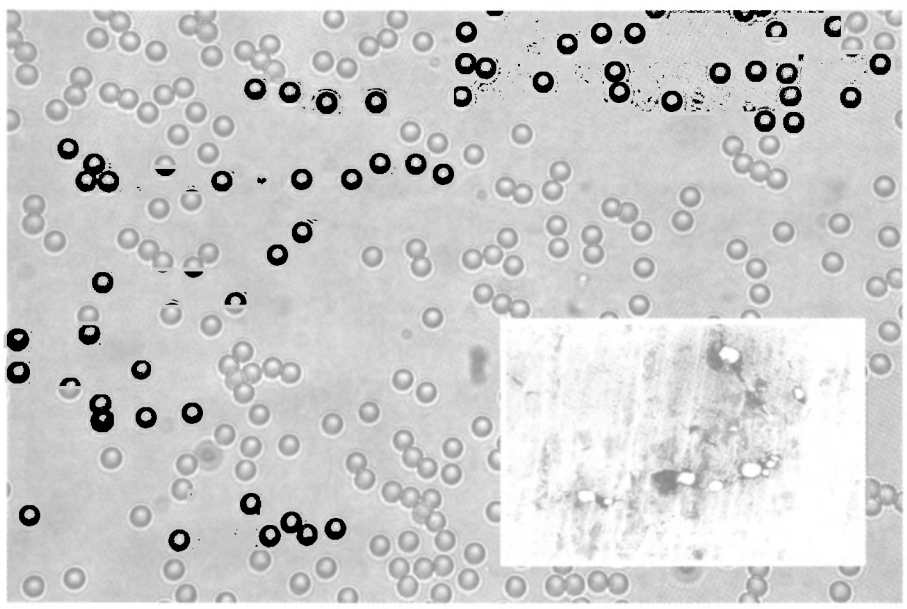
With a meeting of equipment makers, classification societies and shipowners in London last month, it was announced that for the first time purchasers of fuel treatment systems for ships have access to a standardized test method, enabling them to compare different separators and choose the correct size based on separation performance rather than throughput capacity.

Alfa Laval is one of the parties behind the development of the Separation Performance Standard.

Based on a reproducible test method approved by DNV this is becoming a unified standard for independent verification of separation performance in centrifugal separators for marine fuel oils. The standard is expressed as Certified Flow Rate, CFR, and DNV already offers a voluntary Type Approval of separators with CFR as part of its new Class Notation FUEL. The next step is the establishment of an International Standard on separation.

Swedish Standards Institute (SIS) are involved as a competent standardization organization, member of CEN (the European Standardization Committee) and ISO (the International Standardization Organization), said **Gustaf Edström**. Edstrom was assigned by SIS as the project manager for the process of developing a standard on a 'Method for Testing Separation Performance of Centrifugal Separators for Marine Fuel Oil."

Residual fuels may contain contaminants such as water, sediment and catalytic fines all of which have to be reduced to acceptable levels prior to entering the engine. Of these, the most damaging to the engine are catalytic fines, which are hard, abrasive, irregularly shaped particles of aluminum silicate. If catalytic fines are not removed before the fuel oil is injected into the engine, Alfa Laval maintains, they can lodge in injection pumps, piston rings and cylinder liners and cause serious wear that can, in time, lead to breakdowns.



5 µm Dyno particles in test oil. Inset: Cat. fines embedded in piston ring.

According to ISO 8217 standards, the maximum allowable catalytic fines in bunkered fuel is 80 ppm. The engine builder typically stipulates a reduction to a maximum of 15 ppm in the fuel oil when it is injected into the engine.

To achieve satisfactory reduction of contaminants, minimize breakdowns, and prolong service intervals and engine lifetime, the oils are typically cleaned onboard ship by centrifugal separation before being fed to the engine.

However, in the absence of an approved test method for separation performance, the stipulated reduction of cat fines from 80 ppm to 15 ppm is a gray area.

To date, the shipping industry has placed no specific demands on makers of centrifugal separators to prove that the equipment they recommend can achieve this level of performance.

That could be changing, as there is a current push for cleaner marine fuel oils by all parties involved, as classification societies and other players initiate an International Standard on separation performance.

Size Matters

Selection of fuel oil separators is currently based on Maximum Recommended Capacity (MRC) tables provided by separator manufacturers. It is known that separation efficiency is a function of the separator's flow rate. The higher the flow rate, the more particles are left in the oil and therefore the lower the separation efficiency. As the flow rate is reduced, particle removal increases and cleaning efficiency improves. It is, however, essential to know at what capacity adequate separation efficiency is reached in the typical case.

Commitment

for the long run

A separator with world-class backing

A hassle-free product deserves hassle-free support. That's why Alfa Laval creates a marriage of talents.

Our S-separators with Alcap function have a wear-free design and a low number of components. You perform maintenance less often, and when you do it's a simple matter.

But that doesn't mean that you're on your own.

Around the clock and around the globe, our local staff provides on-site repairs and support in your language. Our standard spare parts can reach you in 24-48 hours, and electronic orders are ready by the time you dock. Wherever you are, we do our best to bring you peace of mind.

With our vast experience, we can suggest proven options or tailor a package to meet your needs. So if you're not already working with Alfa Laval, today is a golden opportunity to ring in a change.

For more information about Alfa Laval's commitment to your success, visit us at **www.alfalaval.com/marine**

Alfa Laval Inc., phone: 215-443-4021, e-mail: nonstop.performance@alfalaval.com

Circle 204 on Reader Service Card

Separator manufacturers have been under pressure to deliver more cost-effective equipment to shipyards. As a result, the purifiers have been adjusted to provide higher throughput capacities, sometimes without corresponding improvements in bowl design to maintain safe and consistent cleaning levels.

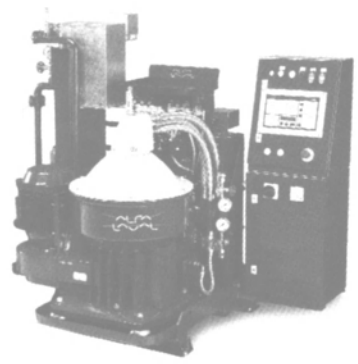
"It seems that today some fuel centrifuges delivered to ships do not provide optimal cleaning of the fuel oil," said **Kjeld Aabo**, Senior Manager of MAN B&W Diesel, Chairman of CIMAC HFO WG, citing fierce competition in the sector as a possible reason. "This is not satisfactory for operators and engine suppliers, and therefore MAN B&W Diesel welcomes a standard for check of centrifuge efficiency. The fuel centrifuge performs the only 'real' cleaning of heavy fuel oil before the engine, independent of the engine design and engine size, and the centrifuge has therefore always to operate optimally."

This capacity race has many potentially negative effects, as it can lead to excessive engine wear, costing ship operators large sums in maintenance and replacement parts. It can also lead to claims against engine builders with regard to excessive wear in engines.

A Standards Initiative

Alfa Laval, in cooperation with a number of classification societies, has already gone a long way towards changing this situation. The company's efforts have resulted in a standard for independent verification of separation performance. It is based on the DNV-approved Dyno Test Method developed in conjunction with Alfa Laval.

An alternative to MRC as a way of specifying separator performance, the new standard is expressed as Certified Flow Rate, CFR.

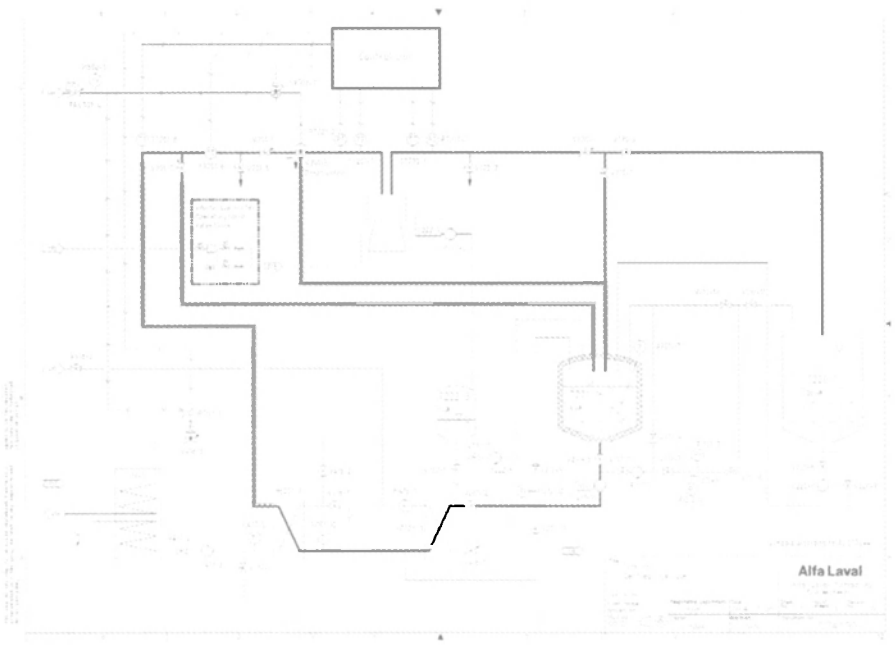


Separation Module

A separator's CFR is the throughput rate at which 85% of 5 micron Dyno particles (simulating harmful catalytic fines) are removed from the test oil (simulating a high viscosity fuel oil). The CFR represents a safe level for continuous, efficient separation.

This gives the industry independent verification of separation performance and makes it possible to compare fuel oil separators based on separation rather than throughput capacity.

In DNV's view, a uniform performance standard and independent verification of performance for Fuel oil separators is important for the industry and something DNV has been working on for more than 20 years as part of the voluntary DNV Class Notation Fuel, said **Kåre Klokk**, Head of Section, Cargo Handling, Piping Systems and MARPOL, DNV. The (London) event represented most parties in the industry work-



ing together to further develop such a uniform performance standard.

The development of the Separation Performance Standard is positive for the shipping industry as a whole.

"As coordinator of the project, I have contacted several of the major actors of the marine industry and found a clear and positive interest," said Edstrom. "A standard of the intended kind is obviously demanded from different industry perspectives. The composition of the group of proposers," illustrates this.

For the shipowner, different separators can be compared on equal terms before deciding on purifiers for newbuilds.

Circle 23 on Reader Service Card

DNV: Helping to Set the Standard

DNV has, for many years, been working with a voluntary class notation FUEL and a separation performance standard as part of that, said Kåre Klokk, Head of Section, Cargo Handling, Piping Systems and MARPOL, DNV. The new voluntary class notation Fuel was intended to meet increasing market demand for the classification of fuel oil treatment and conditioning systems.

The new class notation, FUEL (-cSt, - kg/m3, - °C) in DNV Rules Pt.6, Ch.14, is a total system approach offering owners easy, consistent and predictable fuel treatment and conditioning systems performance. The fuel notation solves the most important element of fuel treatment, that is a standardized and reliable performance criteria governing the fuel oil purifiers' ability to remove abrasive particles from residual fuel.

The mandatory main class rules for fuel systems focus primarily on fire safety aspects and redundancy of components.

Potential problems due to lack of a performance standard have been:

- No unified standard able to monitor fuel oil purifier efficiency and independent verification of performance
- Undersized purifiers resulting in inefficient removal of catalytic fines
- Inaccurate temperature control of purifier pre-heaters affecting efficient purification
- Accumulation of sludge build up in service and settling tanks with potential carry-over of contaminants in heavy weather conditions (roll/pitch)
- Insufficient volume of settling tanks and too short residence time for the removal of impurities
- Fuel tank arrangements do not facilitate the handling of two bunker fuel batches, resulting in sludge precipitation caused by mixing
- Inadequate capacity of fuel oil heaters causing high viscosity levels and inferior combustion
- Inaccurate viscosity control system for fuel feed to engines
- Too small heating capacity in fuel tanks.

The new voluntary DNV class notation FUEL addresses sizing and efficiency of purifiers and the arrangements of fuel bunker tanks, enable bunkering without the risk of mixing incompatible fuels. Additionally, the notation supplies the correct arrangement and sizing of settling tanks to ensure proper separation of water and sludge, correct fuel heater capacity, temperature requirements and viscosity control. The performance test standard for fuel oil purifiers has been developed together with GL and has been discussed with major type-equipment suppliers. Separation efficiency is determined for given viscosities of fuel oil through a standard test procedure using Dyno-spheres as a specified test oil contaminant. This procedure gives consistent measurements of separation efficiency. The correlation between separation efficiency of the artificial contamination with Dyno-spheres and 'real life' residual fuel has been determined through extensive testing by a major fuel oil purifier manufacturer.

Based on the newly developed performance testing method, DNV can now offer a unified standard for independent verification of performance and offer Type approval of purifiers with a Certified Flow rate.

Circle 32 on Reader Service Card

Security of Ports and Vessels: A New Approach

By Jim Ligotti, Maritime Solutions
Ingersoll-Rand Security and Safety

Clearly, the maritime industry is one of the most powerful drivers of international commerce and economic vitality in the world. The statistics are astounding:

- The worldwide fleet of marine containers - a transportation cargo unit that can hold up to 500 computer monitors - is nearly 11 million.
- The European Union, which is the main trading partner for two thirds of the world, in 2001 exported EUR 981 billion and imported EUR 1,027 billion.
- The global ocean-liner shipping industry owns approximately $155 billion in vessels, containers, marine terminals and other direct operating assets now in service around the world.
- Almost 16 million Americans work in port-related jobs, producing $210 billion in federal, state and local taxes annually.

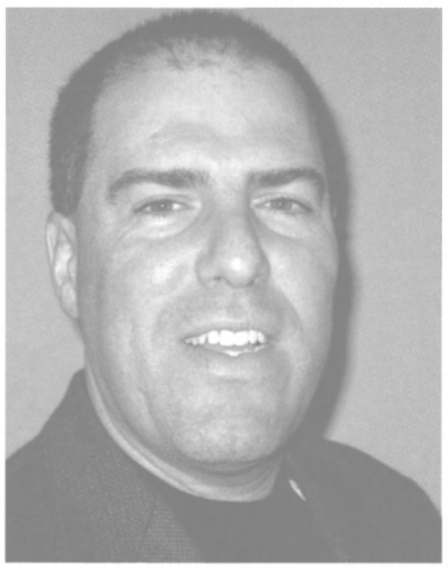
Yet only recently, with the introduction of a new body of international regulations called the International Code for the Security of Ships and of Port Facilities (ISPS) have port and vessel companies and agencies been compelled to implement security and safety measures on a comprehensive, international scale. Now, these companies and agencies are struggling to implement security and safety measures that are both reliable and cost effective. Many are finding that conventional approaches to security and safety possess too many limitations to fulfill both of these goals.

Fortunately, there is a better approach for securing ports and vessels - one that can enhance the effectiveness of technologies such as electronic-access control, time-and-attendance, and closed-circuit television (CCTV) monitoring while also improving business efficiencies. It can help operators of ports and vessels save money while protecting their most vital assets.

Through its Maritime Solutions group, Ingersoll-Rand now is bringing this strategy and expertise to ports and vessels around the globe.

ISPS

Two months after September 11, 2001, the IMO agreed to develop "new measures" for enhancing the security and safety of ships and ports. By December 2002, the IMO had defined and ratified its comprehensive approach as the International Code for the Security of Ships and of Port Facilities (ISPS).



Jim Ligotti

The ISPS code's primary objectives are to establish a framework for the IMO's "contracting" governments to cooperate in taking preventive measures against security and safety threats that could affect the maritime industry. The ISPS code also outlines a methodology for ports and vessel operators to assess their particular levels of security risk and describes mandates they must fulfill to comply with the code.

As required by the ISPS, contracting IMO governments have begun to pass legislation that mirrors the requirements and deadlines for compliance outlined by the new code. The 2002 U.S. Maritime Transportation Security Act, for instance, required the 300 coastal and interwaterway ports of the U.S., and the thousands of vessels that dock at them each year, to define their security plans by December 31, 2003. It also requires operators to implement security measures outlined in the Act by the same deadline provided under the ISPS: July 1, 2004.

In the U.S., the Coast Guard, working with government agencies such as the Department of Homeland Security, is responsible for monitoring compliance at ports and vessels.

What the ISPS Means for Ports and Vessels

ISPS requires companies and agencies involved in maritime trade to implement an unprecedented range of security and safety measures. For many port and vessel operators, the process of installing security systems that comply with the new requirements will continue to be a daunting task for the foreseeable future. Some of the concerns that industry now faces include:

- The high costs of compliance. Although contracting governments are obligated to help fund the costs of added security in their country, the financial burden of installing new equipment, training people and managing new security systems ultimately resides with port and vessel operators. For many operators, the question of how they will fund the high costs of compliance — an ongoing operational cost — the single biggest concern they have with the new legal requirements.
- Best efforts may not be not good enough. Never before have port and vessel operators been required to comprehensively assess their security needs and implement a plan for reliably reducing security and safety risks. For these operators, the process of outlining and implementing an effective plan that both meets regulatory requirements and stays within the limits of their operational cost structure may be a challenge they are unable to fulfill, despite their best efforts.
- Minimal compliance (or none at all). It is likely that many ports and vessels will try their luck, waiting to see what actions enforcement agencies take with others who are noncompliant before deciding to make a full commitment to security and safety. While some may slip through the cracks for a time, most who fail to comply face stiff fines and lost business opportunities from boycotts by other ships and ports.
- Increasing legislation. The ISPS is divided into two sections: Section A, which describes currently mandated security measures, and Section B, which outlines additional steps ports and vessels may decide to take to enhance security and safety based on their individual level of risk. Some companies already have begun to implement elements of Section B both as a "best practice" and in anticipation that the measures it describes will eventually reflect required practice.

About Conventional Security and Safety Systems

The face of security and safety has changed little during the last century. Although new state-of-the-art technologies such as CCTV monitoring and digital-video recording (DVR) are rapidly replacing or supplementing mechanical lock-based solutions, almost all conventional security and safety systems available continue to be built around the same four fundamental characteristics that such systems have shared for decades. Typically, these characteristics result in systems that are unreliable at promoting security and safety and are difficult and costly for the average business and government agency to implement and manage. These four characteristics are:

- **Security specific.** Most conventional security and safety systems work in a vacuum, divorced from other business processes. These conventional systems in no way help to enhance business productivity or otherwise assist managers in running a stronger, more efficient business.
- **Paper based.** Conventional security systems typically rely on paper forms of

(Continued from page 72)

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

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Cospolich Refrigeration, 14695 Highway 61, Norco, LA 70079

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

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

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

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

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

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

ENGINES

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

DEUTZ Corporation, 3883 Steve Reynolds Blvd, Norcross, GA 30093

Fairbanks Morse, 701 White Avenue, Beloit, WI 53111

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

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

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

Trelleborg Engineered Products, P.O. Box 98, Clearbrook, VA 22624

Urethane Products, 9076 Rosecrans Ave. Bellflower, CA 90706

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

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

FILTERS/FILTER SYSTEMS

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

Alfa Laval Tumba AB, 147 80, TUMBA, Sweden

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

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

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

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

FIRE & SAFETY PRODUCTS

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

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

IFSTA/Fire Services Program, 9030 N. Willis, Stillwater , OK 74078-8045
IMSSCO Corporation, 2040 Harbor Island Drive, Ste. 201 A, San Diego, CA 92101

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

FUEL INJECTORS
Interstate Diesel, 4901 Lakeside Avenue, Cleveland, OH 44114-3996

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

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

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

GANGWAYS
WACO, 1330 KNECHT AVE, BALTIMORE, MD 21229

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

GEARS & GEAR REPAIR
Falk Corporation, 3001 West Canal St, Milwaukee, WI 53208-4200
Karl Senner Inc., 25 W Third, Kenner, LA 70062

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

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

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

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

HEAT EXCHANGERS
Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Alfa Laval Tumba AB, 147 80, TUMBA, Sweden
Aquamanne Engineering, P.O. BOX 83495, San Diego, CA 92138
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234, 440-834-5400, 440-834-4950, Contact: Richard Spangler
Tranter, Inc., P.O. Box 2289, Witchita Falls, TX 76307, 940-723-7125, 940-723-1131, www.tranterphe.com

HEAVY FUEL TREATMENT
Alfa Laval Tumba AB, 147 80, TUMBA, Sweden
Algae X International, P.O. Box 4011, Fort Myers Beach, FL 33932

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

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

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

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

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

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

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

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

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

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

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

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

JOINER- WATERTIGHT DOOR-PANELING-CEILING SYSTEM
Joiner Systems, 1925 52nd Avenue, Lacine, Quebec H8T 3C3, Canada
Waltz & Krezner, 91 Willenbrock Rd., Oxford, CT 06478

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

KEEL COOLERS
Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234, 440-834-5400, 440-834-4950, Contact: Richard Spangler

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

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

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

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

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

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

LIGHTING SYSTEMS/ EQUIPMENT
ACR Electronics Inc., 5757 Ravenswood Rd., Ft. Lauderdale , FL 33310-5247
L.C. Doane, P.O. Box 975, Essex, CT 06426
Maritime Associates, P.O. BOX 1788, Crystal Bay, NV 89402, 775-832-2422, 775-832-2424, maritimeas@charter.net, Contact: unknown, www.marinesigns.com

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

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

LUBRICANTS/LUBRICATION SYSTEMS
Benjamin R. Vickers & Sons Ltd., Airedale Mills, 6 Clarence Road, Leeds, W. Yorkshire LS10 IND, UK

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

MANEUVERING EQUIPMENT
Van der Velden Marine Systems, Birkenweg 11, D-21465, Reinbek, Germany

MARINE & OFFSHORE SIGNAGE
Maritime Associates, P.O. BOX 1788, Crystal Bay, NV 89402, 775-832-2422, 775-832-2424, maritimeas@charter.net, Contact: unknown, www.marinesigns.com

MARINE DECKING & FLOORING
Lonseal Flooring, 928 East 238th Street, Carson, CA 90745

MARINE DIESEL ENGINES
MAN Engines & Componets Inc., 591 SW 13th Terrace, Pompano Beach, FL 33069, 800-MAN-2842, 954-946-9098, www.man-mec.com
Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032

MARINE ELECTRONICS
ACR Electronics Inc., 5757 Ravenswood Rd , Ft. Lauderdale , FL 33310-5247
Comark Marine, 93 West Street, Medfield, MA 02052
DRS Technologies, 5 Sylvan Way, Parsippany, NJ 07054
Hatteland Display, Bogstadveien, 19, , N-0355 Oslo, Norway
Jotron Electronics, Box 85 , NO-328OT Jodalyng Norge, Norway
Manne Electronic Solutions, 1522 Crabapple Cove, Jacksonville, FL 32225
Midwest Instrument, 6500 Dobry Dr., Sterling Heights, MI 48314
Saab Manne Electronics, Box 13045, 402 5Goteborg, Sweden

MARINE ENGINEERING
Elliot Bay Design Group, 5301 Shishole Ave. NW, Ste. 200, Seattle, WA 98107
Heger Dry Dock, Inc., 13 Water St., Holliston, MA 01746

MARINE EQUIPMENT
Rasmussen Equipment Co, 8727 5th Ave S, Seattle, WA 98108
Scardana Amencas Bkg , 502 Empire St. , Greenfield Park J4V 1V7, Canada
Waterman Supply, P.O. Box 596, Wilmington, CA 90748

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

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

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

MARINE HAZARD RESPONSE
Marine Respose Alliance LLC, 1102 SW Massachusetts St., Seattle, WA 98134-1030

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

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

MARINE POWER PLANT SYSTEMS
Auramarine Ltd., Box 849 , FI-20101 Turku, Finland
Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032

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

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

MARINE VENTILATORS
Tuthill Energy Systems, PO Box 8000, milbury, MA 01527

MARITIME TRAINING & SCHOOLS
Maine Mantime Academy, MMA, Castine, ME 04420-5000
Marine Safety International, Marine Terminal , Laguardia Airport, NY 11371

METALIZING
Climax Portable Machine, 2712 E. 2nd ST., NEWBERG, OR 97132
Cutting Edge Metal Processing Inc, Po Box 42, Mobile, AL 36601
DMC Clad Metal Division, Po Box 680633, Houston, TX 77266
International Metalizing & Coatings , PO Box 201, Cherry Hill, NJ 08003

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

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

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

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

MOTION CONTROL SYSTEMS
Seastate Pty.Ltd., 2 Egmont Road, Henderson WA 6166, Australia

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

NAV/COMM EQUIPMENT
C- Map Commercial, 133 Falmouth Rd, Mashpee, MA 02649
Chartco, New North Road, Hainault, Ilford Esex 166 2UR, UK
Electronic Manne Systems, 800 Ferndale Pl., Rahway, NJ 07065
Furuno USA Inc., 4400 NW Pacific Rim Blvd, Camas, WA 98607
Hose-McCann Telephone Company, 1241 W. Newport Center Drive, Deerfield Beach, FL 33442, 954-429-1110, 954-429-1130, mchip@hosemccann.com
Mackay Communications, 2721 Discovery Dr., Raleigh, NC 27616-1851

NAVAL ARCHITECTS, MARINE ENGINEERS
A.K. Suda, Inc., 3004 19th St., Metaine, LA 70002-4989
Arthur D. Dargen, Inc, 3200 Ridgelake Dr., Suite 403, Metaine, LA 70002
Band, Lavis, & Associates, Inc., 900 Ritchie Hwy, Suite 203, Severna park, MD 21146
Bay Engineering, 253 N. First Ave., Sturgeon Bay, WI 54235
Bristol Harbor Group, Inc , 103 Poppasquash Road, Bristol, RI 02809
C. Baxter & Associates P.O. Box 9006, Mobile, AL 36609
CDI Marine Co., 9550 Regency Square Blvd. Ste 400, Jacksonville , FL 32222
Computer Sciences Corporation-Advance Manne Center, 1201 M St. SE., Washington , DC 20003
Elliot Bay Design Group, 5301 Shishole Ave. NW, Ste. 200, Seattle, WA 98107
GTR Campbell Marine, 24 Lambton Street, Ormstown, Quebec JOS 1AO, Canada
Guarino & Cox, 639 Lotus Drive, N , Suite 3, Mandeville, LA 70471
Jamestown Marine Service, 1084 Shennecossett Rd., Groton, CT 06340
John J. McMullen Associates, 4300 King St., Suite 400, Alexander, VA 22302
KAVERNER MASA MARINE, 1818 CORNWALL AVE, VANCCOUVER, BC V6J 1C7, Canada
Kvaerner Masa Marine Inc., 201 Defense Highway, Ste 202, Annapolis, MD 21401
MCA Engineers, Inc., 2960 Airway Ave , #A-103 , Costa Mesa, CA 92626
McElroy Machine & Mfg Co., Inc., P.O. Box 4454 , Biloxi, MS 39535-4454
MIL Systems, 200-1150 Morrison Drive, Ottawa, Ontario K2H 8S9, Canada
Nautical Designs, Inc., 2101 S. Andrews Ave , Ste 202, Fort Lauderdale, FL 33316
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave , Seattle, WA 98104
VUYK Engineering, P.O. Box 204. , 9700 AE Groningen, Netherlands
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544

NAVIGATION
ComNav Marine Ltd., 13511 Crestwood Pl , Ste 15 15, Richmond, BC V6V 2G1, Canada
D & B Technologies, 1458 OCEAN SHORE BLVD #132, ORMOND BEACH, FL 32176-3613
Klein Navigation, 11 Klein Drive, Salem, NH 03079, 603 890-1304, 603 890-9796, mail@kleinnavigation.com, Contact: Deborah Durgin, www.kleinnavigation.com
Nauticast AG, Mariahilfer Strasse 50/211, A-1070 Vienna, Austria
Scandinavian Micro Systems, 1001 South Andrews Avenue, Suite 120, Fort Lauderdale, FL 33316

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

OIL SPILL RESPONSE
MARINE PRESERVATION ASSOCIATION, 877 N GAINEY CENTER DR, SCOTTSDALE, AZ 85258
Marine Response Alliance, 1102 SW Massachusettes St, Seattle, WA 98314-1030
Marine Spill Response Corporation, 220 Spnng Street, Suite 500, Herndon, VA 20170

OIL/WATER SEPARATORS
Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Alfa Laval Tumba AB, 147 80, TUMBA, Sweden
MMC International, 60 Inip Dr, Inwood, NY 11096
Westfalia Separator, Inc., 100 Fairway Court, Northvale, NJ 07647, (201) 767-3900, (201) 784-4399, brown.courtney@wsus.com, Contact: Courtney Brown

PAINT APPLICATOR
Mr.Longarm, Inc., P.O.BOX 377, Greenwood, MO 64034-0377

PAINTS AND ANTI FOULANTS
E Paint Company, 25 Research Road, E. Falmouth, MA 02536, 800-258-5998, 508-495-3210, epaint@epaint.net, Contact: Kimberly Fontaine, www.epaint.net
New Coat Technology, LLC, P.O. Box 130 228, Houston, TX 77219, 713-480-4397, 281-469-0147, sales@newcoattech.com

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

PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS
Jesse Engineering, 5225 7th St., E. Tacoma, WA 98424, 253-922-7433, 253-922-2536, tmorgan@jesse-wallace.com
RAMCO Manufacturing Co., 365 Camegie Ave., Kenilworth, NJ 07033
W & O Supply, 3485 Evergreen Ave., Jacksonville, FL 32208

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

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

PORT AUTHORITY
National Port Authority, BOX 32696, 2017 Braamfontein, South Africa

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

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

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

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

PORTAL MONITORS
Canberra Industries, 800 Research Parkway, Meriden, CT 06450, (800) 243-3955, (203) 235-1347, customersupport@canberra.com

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

PROPULSION EQUIPMENT
ABB Turbocharger, Inc , 1460 Livingston Ave., North Brunswick, NJ 08902
Alstom Power Conversion, 3 Ave. Des Trois Chenes, 90018 Belfort Cedex, France
Brunvoll A/S, P.O. Box 370, N-6401 Molde, Norway
Chas S. Lewis & Co. Inc, 8265 Grant Rd, St. Louis, MO 63123
Cummins Marine, 4500 Leeds Ave., Ste 301, Charleston, SC 29405
CWF Hamilton Co., P.O. Box 709 , Christchurch, New Zealand
Fincanteri, Diesel Engine Div , GMT, Bagnoli della, Rosandra 3334 Trieste, Italy
Harbormaster Marine, Inc , 31777 Industrial Rd., Livonia, MI 48150
Karl Senner Inc., 25 W Third, Kenner, LA 70062
Kawasaki Heavy Indust., World Trade Center Bldg., 4-1 Hamamastu-cho, 2-chome, Minato-ku Tokyo 105-6116, Japan
LA.ME Srl, Marine Division, Via della Fornace 4, Opera (MI), Italy
Man B&W Diesel, 17 State St., NY, NY 10004
Man B&W Diesel A/S, Telgtholmsgade 41, Copenhagen SV DK-2450, Denmark
Man B&W Diesel AG, Stadtbachstrasse 1, Augsberg D-86153, Germany
Mapeco Products, 91 Willenbrock Rd., Unit B, Oxford, CT 06478
Napier Turbochargers, P.O. Box 1, Waterside , South Lincoln LN5 7FD, UK
Nya Berg Propulsion AB, Box 1005, 430 90 Ockero, Sweden
Rolls-Royce Commercial Marine, 10255 Richmond Ave., Ste 101, Houston, TX 77042
Voith Schiffstechnik GMBH & Co., P.O. Box 2011, 89510 Heidenheim, Germany
Wartsila Corporation, Box 244, FI-65101 Vasa, Finland
Wartsila Lips, 3617 Koppens Way, Chesapeake, VA 23323
Wartsila North America, Inc., 16330 Air Center Boulevard, Houston, TX 77032
ZF Marine, 3131 S.W. 42nd St., Ft. Lauderdale, FL 33312, 954-581-4040, 954-581-4078, www.zf.com, Contact: A.J. Halavacs, www.zf-marine.com
ZF Marine Group , Ehlerst. 50, 88046 Friedrichshafen, Germany

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

PUMP-REPAIR-DRIVES
New England Pump and Valve, 36 Industrial Park Road, Niantic, CT 06357
Scardana Americas Bkg., 502 Empire St. , Greenfield Park J4V 1V7, Canada

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

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

RIGID INFLATABLE BOATS

Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806

ROPE-MANILA-NYLON-HAWSERS-FIBERS

Lankhorst Touwfabrieken bv, Maritime Div., P.O.Box 203 , NL-8600 AE Sneek, Netherlands, +31 515 487 629, +31 515 487 669, mar.div@lankhorst-touwfabrieken.nl, Contact: unknown, www.lankhorst-touwfabrieken.nl

Marlow Ropes, South Road, Halisham, East Sussex BN27 3JS, UK
Samson Rope Technologies, 2090 Thornton St., Ferndale, WA 98248

ROTATING EQUIPMENT

Delamar Company, Hwy 60, Rt 4, Box 190, Dillwyn, VA 23936
Seatworthy, 22 Main Street, Centerbrook, CT 06409

RUDDER BEARINGS & BUSHES

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

SAFETY PRODUCTS

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

D & B Technologies, 1458 OCEAN SHORE BLVD #132, ORMOND BEACH, FL 32176-3613, 407-647-7500, 407-647-7505, HOTEYE@HOTEYENOW.COM

DBC Marine Safety Systems, 101-3760 Jacombs Rd., Richmond, BC V6V 6T3, Canada
Lalizas SA, 21 Haidariou St., 545 Piraeus, Greece
Norwegian Maritime Equipment AS, BOX 244, NO-5480 HUSNES, Norway
Stearns Mfg. Co., PO Box 1498, St. Cloud, GA 56302-1498
Thordon Bearings Inc., 3225 Mainway, Burlington, Ontario L7M 1A6, Canada
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136
Walport USA , 39-5A Dover Rd South, Toms River, NJ 08757
Warwick Mills, 301 Turnpike Rd, New Ipswich, NH 03071

SALT REMOVING PRODUCTS

Salt Away, P.O. Box 8797, Newport Beach, CA 92658

SALVAGE

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

SANITATION DEVICE- POLLUTION CONTROL

Envirovac Inc, 1260 Turret Dr., Rockford , IL 61111
EVAC Environmental Solutions, 1260 Turret Dr., Rockford , IL 61111

FAST®Systems, 8229 Brentwood Industrial Drive, Brentwood, MO 63144, 314-645-6540, 314-645-6131, solutions@marinefast.com, Contact: Alan Fleischer, www.marinefast.com

Headhunter Inc., 3380 SW 11th Ave., Ft. Lauderdale, FL 33315
Hydroxl Systems, 9800 McDonald Park Rd, Sidney, BC V8L 3S8, Canada
Microphor, 452 E. Hill Rd., Willits, CA 95490

Research Products-INCINOLET, 2639 Andjon Drive, Dallas, TX 75220, 800-527-5551, 214-350-7919, sales@incinolet.com

SATELLITE COMMUNICATIONS

EMS Satcom, Green Lane, Tewkesbury, Gloucestershire GL20 8HD, UK
Eurocom Industries AB, Box 7071, DK-9200 Aalborg SV, Denmark

France Telecom Mobile Satellite Communications, 16,bvd du Mont d'Est-BP 14-93161, Noisy le Grand, France, +33556223231, mobilesat@francetelecom-mobilesat.com, Contact: unknown, www.francetelecom-mobilesat.com

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

KVH Industries Inc., 50 Enterprise Center, Middletown , RI 02842
Land Sea Systems, 509 Viking Drive, Suites K,L,M, Virginia Beach, VA 23452
Nera Satcom AS, Box 91, NO-1375 Billingstad, Norway

Petrocom, 5300 West Sam Houston Parkway North, Houston, TX 77041, 1-800-PETROCOM, 713-580-4150, sales@petrocom.com

Stratos , 1501 Metcalfe St. Ste 1900, Ottawa, Ontario K2P 1P1, Canada
Telenor Satellite Services-Marlink, NO-1331, Fornebu, Norway
Thrane & Thrane A/S, Lundtoftegardsvej 93D, DK-2800 Lyngby, Denmark

SCARIFIERS

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

SEALS

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

Kobelco Marine, Inc., 366 Fifth Avenue, Suite 312, NY, NY 10001, 212-967-5575, 212-967-6966, hawkins@kobelcomarine.com

Orkot Composites, 2535 Prairie Rd, Unit D., Eugene, OR 97402

SEATING

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

SECURITY

Control Screening, 2 Gardiner Rd, Fairfield, NJ 07004

Smiths Detection, 30 Hook Mountain Road PO Box 410, Pine Brook, NJ 07058, 973 830-2131, 973-830-2200, susan.cooper@smithsdetection.com, Contact: Susan Cooper, www.smithsdetection.com

SECURITY BARRIERS

Trelleborg Engineered Products, P.O. Box 98, Clearbrook, VA 22624

SECURITY CONSULTANTS

Solutions Group, 9663 Santa Monica Blvd. Ste 175, Beverly Hills, CA 90210

SENSORS

3 Point Solutions, 810A Tradesmans Park Loop, Hutto, TX 78634
Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065

SHAFT SEALS

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

SHAFT/BORE ALIGNMENT TOOLS

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

SHAFTS

Centa Corp., 815 Black Hawk Drive, Westmont, IL 60559
Geislinger Corporation, 200 Geislinger Drive, Battle Creek, MI 49015

SHIP DISPLAYS

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

SHIP MANAGEMENT

Crowley Maritime, 9487 Regency Sq Blvd, Jacksonville, FL 32225
Eurasia Group , 22A Floor Chinachem Exchange Sq., , 1 Hoi Wan St., Quarry Bay, Hong Kong
OCEAN TECHNICAL SERVICES, MILITARY OCEAN TERMINAL BAYONNE UNIT #8-FOOT OF 32ND STREET, BAYONNE, NJ 07002

SHIP REPAIR

Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates
HALIFAX SHIPYARD, 3099 BARRINGTON ST, HALIFAX, NS, Canada
Manitowoc Marine Group, 1600 Ely St., Marinette, WI 54143-2434
NORSHIPCO, PO BOX 2100, Norfolk, VA 23501-2100
Trident Technologies, 4011 C Highway 377 S., Fort Worth, TX 76109
United Marine Enterprises Inc., P.O. Box 22077, Beaumont, TX 77720

SHIP SIMULATORS

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

SHIPBUILDING-REPAIRS, MAINTENANCE, DRYDOCKING

American Ship Repair, 1011 38th St, Brooklyn, NY 11219
Atlantic Marine, Inc., P.O. Box 3202 , mobile, AL 36652
Austal USA, 100 Dunlap Dr., Mobile, AL 36633
Blount Marine, 461 Water St., Warren, RI 02885
Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374
Curacao Drydock Co., Box 3012 , Wilmestad, Curacao, Netherlands Antilles
Damen Shipyards, P.O. Box 1 Gorinchem, 4200AA Holland, Netherlands
Enavi Reparos Navais Ltda, 169 Barreto,, Niteroi, RJ 24110-200, Brazil
Fincantieri Canterieri Navali Italiani Spa, Merchant Shipbuilding Div., 34123 Trieste, Italy
Gladding Hearn, 1 Riverside Ave., Somerset , MA 02725
Grand Bahama Shipyard, PO BOX F-42498-411, Freeport, Bahamas
GTR Campbell Marine, 24 Lambton Street, Ormstown, Quebec JOS 1AO, Canada
In-Place Machining, 1929 N . Buffum St, Milwaukee, WI 53212
Leevac Industries, LLC, P.O. Box 1190, Jennings, LA 70546
Motor-Services AB, Box 2115 , Ronninge S- 144 04, Sweden
NASSCO, 2798 E HARBOR DR, SAN DIEGO, CA 92113
Newport News Shipbuilding, 4101 Washington Ave., Newport News , VA 23607
Signal International LLC, 2500 City West Blvd. Ste 300, Houston, TX 77042
United Defense, 1525 Wilson Blvd., Ste 700, Arlington, VA 22209-2444
VT Halter, PO Box 3029, Gulfport, MS 39505
Washburn Doughty, P.O. Box 296, E. Boothbay, ME 04544

Willard Marine Inc., 1250 N. Grove St., Anaheim, CA 92806

SHIPYARDS

Alabama Shipyard, P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., P.O. Box 3202 , mobile, AL 36652

Bollinger Shipyards, 8365 Hwy 308 South, Lockport, LA 70374, 985 532-2554, 985 532-7225, RobertS@bollingershipyards.com, Contact: Robert A. Socha, www.bollingershipyards.com

Bradford Marine, 3051 State Rd 84, Fort Lauderdale, FL 33312
Derecktor Shipyard, 311 E. Boston Post Rd., Mamaroneck, NY 10543
Jeffboat, 1030 E.MARKET STREET, JEFFERSONVILLE, IN 47130
Kvaerner Masa-Yards Oy, BOX 132, FI-00151, Helsinki, Finland
Leevac Industries, LLC, P.O. Box 1190, Jennings, LA 70546
Offshore Inland, 3521 Brookdale Dr. S., Mobile, AL 36618
United Defense, 1525 Wilson Blvd., Ste 700, Arlington, VA 22209-2444

SILENCERS

EM Products, 5380 Cottonwood Lane, Prior Lake, MN 55372, (952) 440-9200, (952) 440-3400, sales@zerostart.com

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

SIMULATION TRAINING

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

SKILLED LABORERS

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

SLIDING DOORS

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

SOFTWARE

Autoship Systems Corp., 611 Alexander Street, Suite 312, Vancouver, BC V6A 1E1, Canada, 604-254-4171, 604-254-5171, sales@autoship.com, Contact: Ross Muirhead, www.autoship.com

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

Loadmaster International , St. Varvsgarten 11B SE, 211 19 Malme, Sweden
Resergence Software Inc. ., 2021 Lakeshore Dr., Ste 21D, New Orleans, LA 70122

STEERING GEARS/ STEERING SYSTEMS

A. Van der Velden B.V., Dorpsstraat 67a, PO Box 2061, 2930 AB Krimpen a/d Lek, Netherlands

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

Jastram Engineering, 467 Mountain Hwy, North Vancouver, BC V7J 2L3, Canada
Kobelt Manufacturing Co., Ltd., 8238-129 Street, Surrey, BC V3W0A6, Canada
Offshore Inland, 3521 Brookdale Dr. S., Mobile, AL 36618

STERN TUBE BEARINGS/ BUSHES

Duramax Marine LLC, 17990 Great Lakes Parkway, Hiram, OH 44234, 440-834-5400, 440-834-4950, Contact: Richard Spangler

Orkot Composites, 2535 Prairie Rd, Unit D., Eugene, OR 97402
Thordon Bearings Inc., 3225 Mainway, Burlington, Ontario L7M 1A6, Canada

STERN TUBE SEALS

Superbolt, PO Box 683, Carnegie, PA 15106

STRAINERS

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

SUN PROTECTION SYSTEMS

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

SURFACE PREP TOOLS

Aurand Mfg., 1210 Ellis St , Cincinnati, OH 45223
Dalseide Shipping Services, NO-5397, BEKKJARVIK, Norway

Flow International Corp., 23500 64th Ave., South Kent, WA 98059, 800-446-3569, 253-813-9377, mbest@flowcorp.com

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

NLB Corp., 29830 Beck Road, Wixom, MI 48383, 248-624-5555, 248-624-0908, nlbmktg@nlbusa.com, Contact: Jenna Eads, www.nlbcorp.com

Ultrastrip Systems Inc., 3515 SE Lionel Terrace, Stuart, FL 34997, 772-287-4846, 772-781-4778, sales@ultrastrip.com, Contact: John Odwazny, www.ultrastrip.com

SURVIVAL EQUIPMENT

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

SWITCHBOARDS

Industrial Power Systems, 3010 Powers Avenue Unit 16, Jacksonville, FL 32207, 904 731-8844, 904 731-0188, marine@ipsjax.com, Contact: Glenn Beaupre, www.ipsswitchgear.com

TANK LEVELING INDICATORS

Ian Conrad Bergan, 3119 North Davis Highway, Pensacola, FL 32503, 850-434-1286, 850-434-1246, sales@icbergan.com, Contact: Ron Monell, www.icbergan.com

King Engineering Co, PO Box 1228, Ann Arbor, MI 48106
Kockum Sonics LLC, 933 Industry Road, Suite 105, Kenner, LA 70062
Saab Marine Electronics, Box 13045, 402 5Goteborg, Sweden
Technical Marine Services, 6040 North Cutter Circle, Portland, OR 97217

TEAK DECK SEALANT

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

TESTING SERVICES

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

THICKNESS GAUGES

StressTel Ultrasonic Testing, 2790 West College Avenue, State College, PA 16801-260

THRUSTER SYSTEMS

Omnithruster , 30555 Solon Industrial Parkway, Cleveland, OH 44139, 440 542-9260, 440 542-9265, widmer@omnithruster.com, Contact: Kurt Widmer, www.omnithruster.com

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

TRAINING

International Maritime Training, 910 SE 17th St., Ste 200, Fort Lauderdale, FL 33316
SUNY Maritime College, 6 Pennyfield Ave, Bronx, NY 10465-4198
USMMA- Global Maritime and Transportation School, 300 Steamboat Rd., Kings Point, NY 11024

TRANSMISSIONS

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

TRAVEL SERVICES

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

TURBOCHARGERS

ABB Turbo Systems AG, CH 5401, Baden, Switzerland

TURBOCHARGERS- REPAIRS

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

ULTRA HIGH MOLECULAR WEIGHT MARINE FENDERING

Ultra Poly, Inc., 2926 So.Steele Street, Tacoma, WA 98409

ULTRASONIC TESTING

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

ULTRATHIN (UHMW) NON-SKID DECKING

Ultra Poly, Inc., 2926 So.Steele Street, Tacoma, WA 98409

UNDERWATER SURVEILLANCE SONAR

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

VACUUM EQUIPMENT

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

VACUUM TOILET SYSTEM

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

VALVES

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

VALVES & FITTINGS

Leslie Controls, 12501 Telecom Dr., Tampa, FL 33637
William E. Williams, 38-52 Review Ave, Long Island City, NY 11101

VENTILATION SYSTEMS / PRODUCTS

Delta T Systems, 858 West 13th Court, Riviera Beach, FL 33404
Dry Air Technology, 313 North Oak St., Burlington, VA 88233
Jon M. Liss Associates, PO Box 5005-73, Rancho Santa Fe, CA 92067

VIBRATION ANALYSIS

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

VIBRATION CONTROL PRODUCTS

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

VISCOMETERS

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

VOYAGE DATA RECORDERS

Rutter Technologies Inc., 22 Pearl Place, P.O.BOX 427, St. John's NL A1C 5N8, Canada

WASTE WATER TREATMENT

EVAC Environmental Solutions, 1260 Turret Dr., Rockford , IL 61111, 815-654-8300, 815-654-8306, sfredrick@evac.com

FAST®Systems, 8229 Brentwood Industrial Drive, Brentwood, MO 63144, 314-645-6540, 314-645-6131, solutions@marinefast.com, Contact: Alan Fleischer, www.marinefast.com

Marine Environmental Partners, 3874 Fiscal Ct, Suite 200, West Palm Beach, FL 33404
RWO , Leerkampe 3, D- 28259 Bremen, Germany

ZNC International Incorporated, 200 William Street , Port Chester, NY 10573, 800-552-4403 / 914-690-0650, 914-690-0653, Chris@znclink.com, Contact: Chris Zimmerman, www.znclink.com

WATER JET CLEANING

Flow International Corp., 23500 64th Ave., South Kent, WA 98059
Gardner Denver Water Jetting Systems, 12300 N. Houston Rosslyn Road, Houston, TX 77086
NLB Corp., 29830 Beck Road, Wixom, MI 48383

WATER PURIFIERS

Alfa -Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Gardner Denver Water Jetting Systems, 12300 N. Houston Rosslyn Road, Houston, TX 77086

Pentair Water Treatment, 502 Indiana Avenue, SheBoygan, WI 53081, 866-873-7506, 866-203-7361, customerservice@plymouthwater.com

Reverse Osmosis of South Florida, Inc., 150 S.E. 29th St., Fort Lauderdale, FL 33316, 954-462-4114, 954-467-6080, sales@desalinator.com

WATERTIGHT CLOSURES

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

WELDING PRODUCTS & POWER EQUIPMENT

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

Integro, 290 Pratt Street, Meriden, CT 06450

WINCHES & FAIRLEADS

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

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

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

Intercontinental Engineering , PO Box 9055 , Kansas City, MO 64168
Jeamar Winches, 1051 Clinton St., Buffalo, NY 14206
Markey Machinery, P.O. Box 24788, Seattle, WA 98124

McElroy/Catchot Winch Company, Inc., P.O. Box 4632, Biloxi, MS 39535-4632, 228-875-6327, 228-872-7880, hcatchot@bellsouth.net, Contact: Harold Catchot, www.mcelroycatchotwinch.com

MMC International, 60 Inip Dr, Inwood, NY 11096
Nabrico Marine Products, 1050 Trinity Road, Ashland City, TN 37016

Patterson Company, 3 Riversea Roads, Pittsburgh, PA 15233, 800-322-2018, 412-322-2785, info@wwpatterson.com

Skookum , P.O. Box 280, Hubbard, OR 97032
Smith Berger Marine, 7915 10th Ave. S., Seattle, WA 98108
Superior Lidgerwood Mundy, 1101 John Ave., Superior , WI 54880
Timberland Equipment Ltd & Almon Johnson, 459 Industrial Ave., Woodstock, ON N4S 7Z2, Canada

WINDLASSES (ANCHORS)

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

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

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

McElroy/Catchot Winch Company, Inc., P.O. Box 4632, Biloxi, MS 39535-4632, 228-875-6327, 228-872-7880, hcatchot@bellsouth.net, Contact: Harold Catchot, www.mcelroycatchotwinch.com

WINDOWS

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

WINDSCREEN & WINDOW WIPERS

Bae Systems, 550 South Fulton St., Mt. Vernon, NJ 10550
Hepworth Marine International , Hepworth House, Brook St., Redditch, Worcestershire B98 8NF, UK
Wynn Marine, Ltd., Wynn House, Lansdown Estate,Cheltenham, Gloucestershire, UK

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Products

Autoship

Autoship Systems Corporation is releasing Autohydro 6.0, its latest hydrostatic and longitudinal strength program. 3-D modeling, inclusive of all tanks, holds, spaces, etc, gives unrivaled accuracy and flexibility - making Autohydro perfect for simulating damage, grounding, or capsizing in any wind condition. After 20 years, Autohydro remains the best value for the dollar.

Circle 101

Furuno

The FA-100 is a universal shipborne AIS capable of exchanging navigation and ship data between own ship and other ships or coastal stations. The FA-100 consists of VHF/GPS antennas, a transponder unit and several associated units. The LCD panel displays all required information about Static data, Dynamic data, Voyage related data and Short safety-related messages.

Circle 102

Kistler

In the future, smart sensors will simplify measurement tasks, significantly increase process security and improve data quality. Kistler has already begun manufacturing its own line of PiezoSmart accelerometers and pressure sensors with automatic sensor identification.

Circle 103

Lubmarine

Aurelia XL has been formulated, using an additive technology to cope with the environment of marine engines. Its clean formulation reduces oil consumption by maintaining the ring pack in good condition. Its resistance to oxidation and thermal break down reduces oil viscosity increases leading to an improvement in lubricants life.

Circle 104

MMC

MMC CI Couplings provide the quickest, safest possible flanged connection on a wide variety of applications. The helical cams are rotated into place with the average connection taking less than one minute. Each cam in individually locked into place resulting in a vibration proof, leak prof, twist proof connection.

Circle No. 105

Onyx

The marine planetary gear units of series PLS and PWS have been specially designed for use in fast vessels, such as corvettes, patrol boats and yachts. With a capacity range from 1,500 to 10,000 kW and reduction ratios from 1.5 to 7.1, they cover all known requirements. The RENK planetary gears for fast vessels are available as a disconnectable reduction gear unit and as a reversing gear unit.

Circle 106

Polyspec

PolySpec L.P. announced that LITE LATEX Light Weight Polymer Modified Underlayment has received Certificate of Approval under the IMO's newly established International Application of Fire Test Procedures (FTP Code.) Lite Latex joins PolySpec's FLEX-IMO Vinyl Chip Seamless Floor and 7K Deck Top Magnesite Insulation as the third PolySpec product to receive IMO certification.

Circle 107

Samson

Let Samson be part of the solution to your operational problems. Talk to an application engineer or trained sales representative who can recommend a product for your application, or help develop a solution engineered to address the requirements of your operation. The strength of Samson will help make your marine operations safer and more efficient while reducing operating costs.

Circle 108

Simrad

Simrad's new CF Series marine monitors will be offered in 15, 17, 19 and 23 in. versions, to accommodate bridge layouts and helm stations of various sizes. With its TFT MVA Premium technology, this series is designed to provide clarity, realistic colors and superior definition whether displaying sonar, echosounder, radar, chart plotting or other fishfinding or navigation data.

Circle 109

Stork

Stork-Kwant designs and manufactures nautical instruments for over 60 years. The range of products consists of: Control Units, Telegraph Systems, Rotating and Speed Control Units (RSCU), Electric Shaft Systems, various types of Indicators etc. Latest developments: small control unit BUK-G, RSCU Mark 3 Star and Mark 4, Joystick 96 x 96 mm.230V models.

Circle 110

Wortelboer

G.J. Wortelbower Jr. B.V. is specialized in the supply of marine products, essentially anchors, chaincables, winches and windlasses, with deliveries on a worldwide basis. Its headquarters are located in Rotterdam where a substantial stock is kept, guaranteeing immediate delivery of virtually any port in the world.

Circle 111

Wartsila

Wartsila is a supplier of marine engines and propulsion systems for all types of vessels and offshore applications. As The Ship Power Supplier Wartsila is committed to serving the marine market with reliable, cost effective and environmentally sound marine power systems.

Circle 112

Centa

Whether you have small, medium, or large horsepower; rigid or resilient mountings; remote or close-coupled gearing; Centa can meet requirements with state-of-the-art torsional coupling solutions. Their products are used on diesel, natural gas and gasoline engines. Main drives or for electrical power generation. Centa offers complete torsional vibration analysis as well as total global product support.

Circle 113

Ultra Poly

Forklift traction on wet surfaces is an ongoing problem. Spinouts and sliding make the driver's work difficult and unsafe. Special features include easy installation and the sheet can be turned over if wear or damage does occur and the non-skid surfaced backside reinstalled. Ultra Non-Skid is corrosion resistant, and a permanent replacement for non-skid tape or paint.

Circle 114

Dolphin

Norwegian Maritime Equipment AS will distribute Dolphin pneumatic and port fenders in most European countries. The Korean manufacturer of the Dolphin fenders, Kum Nam D&F of Pusan, has given affiliate NME the exclusive right to market and sell the Dolphin fenders in Norway, Sweden, Denmark, Finland, Iceland, U.K., Spain, Portugal, France, Germany, Poland and among other countries.

Circle 115

AKA

AKA specializes in customized automated control systems, the development of which requires a high level of data management and project control. The company has been in operation since 1996 carrying out engineering activities in the areas of software development, automation, systems engineering, and technical training and documentation.

Circle 116

IMC

IMC's metalizing process offers corrosion protections. Metalizing has no harmful chemicals, VOCs or cure time, and isn't temperature dependent for application. Metalizing reduces overall life-cycle costs. IMC's patented equipment is portable to reduce out-of-service time, and they're ABS certified for zinc and aluminum applications.

Circle 117

HO Bostrom

H.O. Bostrom's SeaPost Helm offers complete adjustability and ergonomic support for ultimate occupant comfort. Available in 3 base module heights and can be used with 36" floor slide rails.

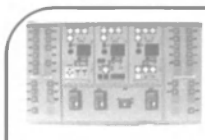
Circle 118

Anchor Lamina

Versatile hydraulic drill system is portable like electric drills, but lasts longer (typically 10 to 20 years) with little maintenance. It drills or taps up, down and sideways, even underwater. Six interchangeable heads, with a variety of quick-change tools and simple, convenient controls. Meets NEMA, CE and other global standards. Also available for rent.

Circle 119

IPS



Industrial Power Systems offers a full line of marine switchboards for any application. All are custom built to your design and in conformance with any required regulatory body rules. American quality and craftsmanship since 1981.

Circle 120

SeaLife

SeaLife Anti-Foul Paints are non-ablative, non-self polishing, and do not rely upon the integrity of their surface coat wearing away by through-water friction, nor do they rely on any leaching of their active ingredient to perform their anti-foul characteristics. **Circle 121**

Tigair

Because it is air-powered, the Tigair portable saw can be used in areas where electrical tools may be unsafe; even under water, oil, waste or non-corrosive chemicals. It's flat, slim design simplifies cutting in boilers, heat exchangers and other areas where access id difficult and working space is minimal.

Circle 122

Renk

The marine planetary gear units of series PLS and PWS have been specially designed for use in fast vessels, such as corvettes, patrol boats and yachts. With a capacity range from 1,500 to 10,000 kW and reduction ratios from 1.5 to 7.1, they cover all known requirements. The RENK planetary gears for fast vessels are available as a disconnectable reduction gear unit and as a reversing gear unit.

Circle 123

Desmond Stephan

The performance of your Swirl-Off tool is dependent on the power it receives from your disc sander, grinder, polisher, or drill motor. As a general rule, the higher the RPM the faster the material will be removed. The tool will give its utmost performance when a disc sander with speeds from 1500 to 4000 rpm are used.

Circle 124

Hamilton Jet

The larger Hamilton Jet HM Series of waterjets are an extension of their range of smaller jets. As boat speeds rise above 25 knots, Hamilton Jet waterjets return higher propulsive coefficients than conventional propellers. Hamilton Jet innovation is the result of ongoing research and development utilizing its on-site hydrodynamic test rig facility and test boat program.

Circle 125

Products

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Keyed-lok, manufactured by Bryce Fastener Manufacturing features different, randomly selected, privately exclusive socket geometry for every purchaser. The screws feature a lock "keyway" forged into a screw head. Millions of variations are randomly available on each customer order, giving users a private or exclusive fastener.

Circle 127

Fender Care

Fender Care Marine Solutions distributes and operates the Yokohama pneumatic fender including Naval grey fenders. Manufacturer of deck mooring equipment, quayside bollards, navigation and safety buoys, marine hardware (anchors, chain), with bases in U.K. Europe, ME, Africa, SE Asia and the U.S. Full ship-to-ship transfer service world-wide.

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Intenselite

Transit, developed by Intenselite,, is a flexible lighting system. Using a development of traditional fiber optic technology, the cable is energized by a very compact high efficiency laser, resulting in the generation of light along the entire length of the cable. It can be used in diverse environments, and the lack of electricity in the rope makes it intrinsically safe.

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York

York Marine Systems is the name of the multinational division within YORK International that operates as one organization to supply naval and commercial marine air conditioning and refrigeration products and services.

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MS Pumps

MS Pumps now offers the April 2004 availability of its latest marine/industrial pump: The LiL Squirt. Built with 316 investment cast stainless steel, it delivers corrosion resistance in the transfer of chemicals and sea and potable water used in live wells, bait tanks and general wash down.

Circle 133

Teleflex

Teleflex Marine engineers has created two new products- CH5600e and CH4400e- for boaters who want the familiar look and feel of Teleflex's venerable mechanical controls with all the benefits of state-of-the-art electronic control technology. And they've hit the target by combining these control heads with the performance of Teleflex's award-winning i6000 electronic shift and throttle system.

Circle 132

Blue Sea

Blue Sea Systems now offers backlighting as a standard feature, as well as "ON"-indicating LED lights for all circuits. They have expanded their line-up of AC, DC and AC/DC panels with digital and analog meters to 66 configurations. Among the new offerings is a line of 240V main circuit breaker panels that join the existing 120V and 230V models.

Circle 131

Verint

Verint is a of analytic software solutions for communications interception, digital video security and surveillance, and enterprise business intelligence. Verint Video Solutions transform raw video into actionable intelligence - mission-critical analysis to enhance security, surveillance and increase enterprise profitability.

Circle 136

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Signal International is a marine and fabrication company in the Gulf of Mexico. From Mississippi to Texas, their six facilities are located to allow unrestricted access to the Gulf. S.I. has a proven track record for quality repair, new construction and modernization of offshore drilling rigs, barges and other vessels for the marine industry.

Circle 137

Ryton

Oberdorfer Pumps now offers the new Ryton Seal-Less Mag-Drive Pump as an alternative to the high cost of Alloy C. The pump design and materials selection together provide the longest life available from the Ryton Mag-Drive Pump. This Seal-Less rotary gear pump offers a wide range of chemical compatibility utilizing Ryton and Alloy C.

Circle 138

Midwest

The model 120 series Filter Minder differential pressure gauge manufactured by Mid-West Instrument is a rugged, accurate gauge designed specifically for seawater applications. The new 120 gauge may be used in a variety of applications where seawater may pose a problem, both on shore and offshore. The differential pressure is sensed by the movement of a floating piston magnet against a calibrated spring.

Circle 139

Hamilton Jets

The larger Hamilton Jet HM Series of waterjets are an extension of their range of smaller jets. As boat speeds rise above 25 knots, Hamilton Jet waterjets return higher propulsive coefficients than conventional propellers. Hamilton Jet innovation is the result of ongoing research and development utilizing its on-site hydrodynamic test rig facility and test boat program.

Circle 140

Frank Mohn AS

Frank Mohn

Frank Mohn supplies submerged cargo pumps to the world tanker market. The company was founded in 1938 and is located outside Bergen in Western Norway. They offer FRAMO Cargo offloading pumps for FPSO applications. A FRAMO cargo pumping system includes professional assistance during project evaluation, technical support during engineering.

Circle 145

Offshore Davits

Offshore Davits lifeboat systems incorporate launching capacity for up to 80 people, controlled gravity lowering 0-60 m/min., minimal interface connection, final paint finish, electric cabling, among other features. It is designed and manufactured to handle all types of totally enclosed lifeboats and rescue boats onboard fixed and floating facilities.

Circle 144

Westfalia

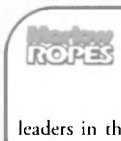
Westfalia's Separator is regarded as a leader in the field of centrifugal separation technology. Centrifugal separators have been in the company's production schedule since its formation in 1893. Today, thousand of centrifuges from Westfalia Separator take care of the reliable and economical treatment of ineral oil and oily water.

Circle 143

MSA

The Ultima XE Gas Monitor from MSA Instrument Division now features an integral XP push button switch that enables easy resetting of latching alarms. The switch has earned cUL approval for Class 1, Div 1, Groups B, C and D. The monitors provide continuous monitoring of combustible and toxic gases and oxygen deficiency, using catalytic and electrochemical technologies.

Circle 142



Marlow Ropes

Marlow Ropes Ltd, an approved BS EN ISO 9001 Company are leaders in the innovative use of new specialist fibers and rope constructions. Their extensive rope production and purpose built rigging facilities at Hailsham, combined with buoyancy equipment manufactured at their Coatbridge, Scotland factory, gives allows for total capability in the quality manufacture of complete SPM and Tandem mooring systems.

Circle 141

Leslie Controls

Leslie Controls has released their new Steam & Thermal Fluid Controls brochure. The new brochure includes photos and descriptions for every product in Leslie's extensive line, suitable for Industrial/Commercial, Power, Process and Maritime applications.

Circle 146

Wynn

Traditional wiper control systems run on an analogue basis but the digital nature of the Series 3000 Network Control system makes it a far more powerful utility. Among the many features, the Series 3000 has a LCD console mount control panel, modular systems that offer full flexibility and full wiper control including integral wash and air purge.

Circle 147

Nauticast

A specialist in AIS technologies, Austrian based Nauticast AG introduced the X-Pack DS, a mobile Class A AIS unit, which was among the first systems to receive BSH Wheelmark (EC) type approval, and holds worldwide approvals by the U.S. Coast Guard, FCC, CCS (China Classification Society) and many others.

Circle 148

Marflex

Marflex manufactures electric driven Deepwell pumps for cargo, slop, condensate and ballast water discharge on board of inland barges, Product- & Chemical tankers, FSO's & FPSO's. Capacities from 50 m3/hr up to 2000 m3/hr for 1000 DWT up to 300.000 DWT vessels Marflex was founded in 1980 and has experience on board of barges, tankers and FSO/FPSOs.

Circle 149

Thrustmaster

Thrustmaster of Texas, Inc. is a privately-owned corporation based in Houston, Texas. Thrustmaster manufactures marine propulsion equipment, including deck-mounted propulsion units, thru-hull azimuthing thrusters, retractable thrusters, tunnel thrusters, and portable DP systems.

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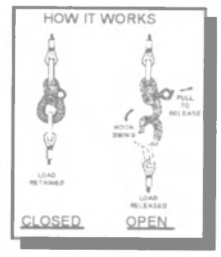

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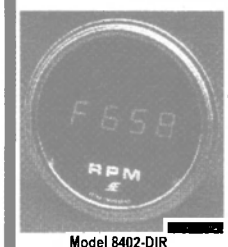

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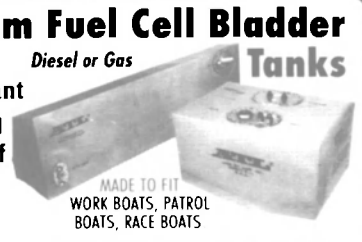

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(Continued from page 60)

identification (I.D.), such as drivers' licenses and social security cards, to verify the identity of individuals looking to access secure areas of a facility. Paper forms of I.D. — which colleagues can share and criminals can steal or forge - are inherently unreliable when used to verify identity. The process of screening paper-based I.D. typically requires recording data, such as a driver's license or Social Security number, by writing it down or making photo copies - a time consuming process that risks infringing on privacy rights.

• **People driven**. In order to screen paper forms of I.D. and track the movement of individuals throughout a facility, an organization needs to employ security personnel. Security personnel are often difficult to train, costly to hire, and undependable.

• **Point oriented**. Conventional security systems are designed to secure specific points, or areas of concern, at a facility. Specific points include cargo, entrances to a vessel, and equipment. Because conventional approaches focus on specific points, one facility may have several disparate security systems serviced by different vendors. For instance, a CCTV system installed by one vendor for monitoring cargo may work independently of an access-control system installed by another vendor for granting access to truckers who transport cargo. A facility that relies on point-based solutions is invariably inefficient, poorly accommodates change and growth in security needs, and can quickly become unmanageable.

For certain applications, conventional security systems that use decentralized paper- and people-based systems may be a reasonably effective, if not optimal, approach for promoting reliable security and business efficiency. The manager of a small corporate office with a couple dozen employees and a handful of daily visitors, for instance, may determine that hiring a security guard or two to screen building badges suffices for the company's security needs.

But in the complex world of maritime trade — where hundreds or even thousands of crew members, drivers, maintenance workers, administrators and longshoremen, employed by unaffiliated companies and agencies, work together to move goods in and out of a port - a system of security that relies on paper and people to track, manage and monitor vulnerable assets is both inefficient and undependable.

The IS Solution

Ingersoll-Rand has developed the IS, or Integrated Security solution. At the heart of IS is the process of integrating the security and safety requirements for every element of, and activity that takes place, at a facility. These elements and activities may be categorized as people, openings, and assets. For instance, a ship's "openings" include the engine control room, electrical control/equipment room, cargo storage area, bridge, and steering gear room. A port's "people" include longshoremen, crew, administrators, maintenance workers, and truck drivers. Assets for both a port and vessel may include the vessels themselves, equipment, vehicles, containers and cargo. Integrated Security connects people, openings and assets together through a connected information-technology infrastructure based on an expandable, open architecture. Data is generated through the power of electronics — access cards with electronic codes or biometric identifiers replace paper forms of I.D. and significantly reduce the number of security personnel required for security screening. Because the architecture is open, the system easily accommodates the addition of new security applications (i.e., a remote-monitoring system) as modules to a shared database. The result is a highly reliable system that coordinates remote-monitoring, access-control, time-and-attendance, CCTV surveillance and other technologies and processes designed to secure a facility's assets. (See Table 1 below).

Examples of how IS can help a typical port and vessel enhance security and safety while also promoting efficiencies include:

• **Track crew at ports of call**. Under the ISPS, vessels must maintain and manage records showing the last five ports each member of its crew last visited. While a conventional security system using paper-based tracking systems would be hard pressed to fulfill this challenge, Integrated Security combines time-and-attendance with access-control technologies to generate easily the required information when required.

Table 1
Comparison Between Conventional Security Systems and IS

Conventional Security	Integrated Security
1. Focus on restricting access at particular entrances and assets.	**1.** Focus on engineering facility-wide security systems.
2. Uses people and paper to govern specific openings and assets.	**2.** Uses integrated information technologies managed at a central location.
3. Limits access by unauthorized people at specific openings and assets - cumbersome and time consuming.	**3.** Facilitates seamless movement of authorized people throughout a facility when and where they need it - efficient and hassle free.
4. Relies on people screening paper forms of I.D. that can be lost, stolen or forged - unreliable, inefficient and difficult to change.	**4.** Uses access cards with electronic codes or biometric identifiers that would be highly difficult, if not impossible, to replicate - fast, efficient and reliable.
5. Relies heavily on the expertise, judgment and inclinations of security personnel.	**5.** Relies on trustworthy, rule-based systems.
6. Subjects each person to a similar security screening process regardless of her or his level of authorization.	**6.** Access granted for each employee's individual authorization level, as recorded in an access card, and by the facility's MARSEC level.
7. Tracks assets and personnel using disparate, unconnected systems.	**7.** Tracks assets and personnel using a single, connected database.
8. Security systems are point-based - they each have their own procedures and processes.	**8.** Systems are fully integrated to promote greater reliability and efficiency.
9. Relies on several vendors working on different applications - no single point of accountability.	**9.** Employs a limited number of vendors partnering to achieve a common strategy.
10. As systems grow, they become more decentralized and less manageable.	**10.** Easily accommodates expansion. As systems grow, they become better able to promote efficiencies and dependability.
11. Point-based security systems are never fully integrated into other business operations.	**11.** Security systems are integrated with other business operations. They become a tool for promoting innovation and enhancing overall business efficiency.

• **Improve productivity of truckers**. Truck drivers typically have no way of systematically alerting a vessel's crew of their arrival time at a port. When they arrive, drivers must wait for crew to prepare cargo for transport - a poor use of time that likely adds up to millions of dollars in lost productivity for a typical shipping company. Using IS, registered drivers can electronically signal their scheduled time of arrival in advance so that when they arrive, cargo is ready for departure.

• **Automated response to different security levels**. If an emergency or threat to security arises, IS can quickly adopt different levels of access control, such as might be defined according to different MARSEC levels, for authorized and unauthorized individuals. For instance, in an emergency that requires people to exit a vessel quickly, through IS, all major exits can open rapidly and automatically. For another threat, a IS system may close certain exits or allow only individuals with a specific authorization to pass through them.

• **Minimize costs for damage claims**. Although many port managers contend that their facilities are responsible for no more than one third of the total cost they pay annually to settle damage claims for damaged containers, they traditionally have not had a mechanism for proving their innocence. By facilitating the generation of easy-to-navigate reports and video clips that demonstrate at what time and location a particular container was harmed, Integrated Security helps to minimize costs associated from unfair claims.

• **Identification Cards**. The IMO has called upon contracting governments to issue "seafarer" identification cards that can be used to verify an individual's identity to all personnel involved in the maritime transportation industry. In similar fashion, the U.S. is finalizing plans for a prototype phase of the Transportation Worker Identification Credential (TWIC), an electronic "smart card" that contains coded information, such as biometric identifiers and bar codes, for the 15 million transportation workers in the U.S. who need access to secure areas of airports, seaports and land border crossings. As an approach that relies on electronics and biometrics to verify identify, IS can readily accommodate the seafarers, TWIC and other identification card requirements.

About the Author

Jim Ligotti is vice president for Maritime Solutions within Ingersoll-Rand Security and Safety Solutions, which specializes in implementing integrated security and safety systems across one or more facilities.

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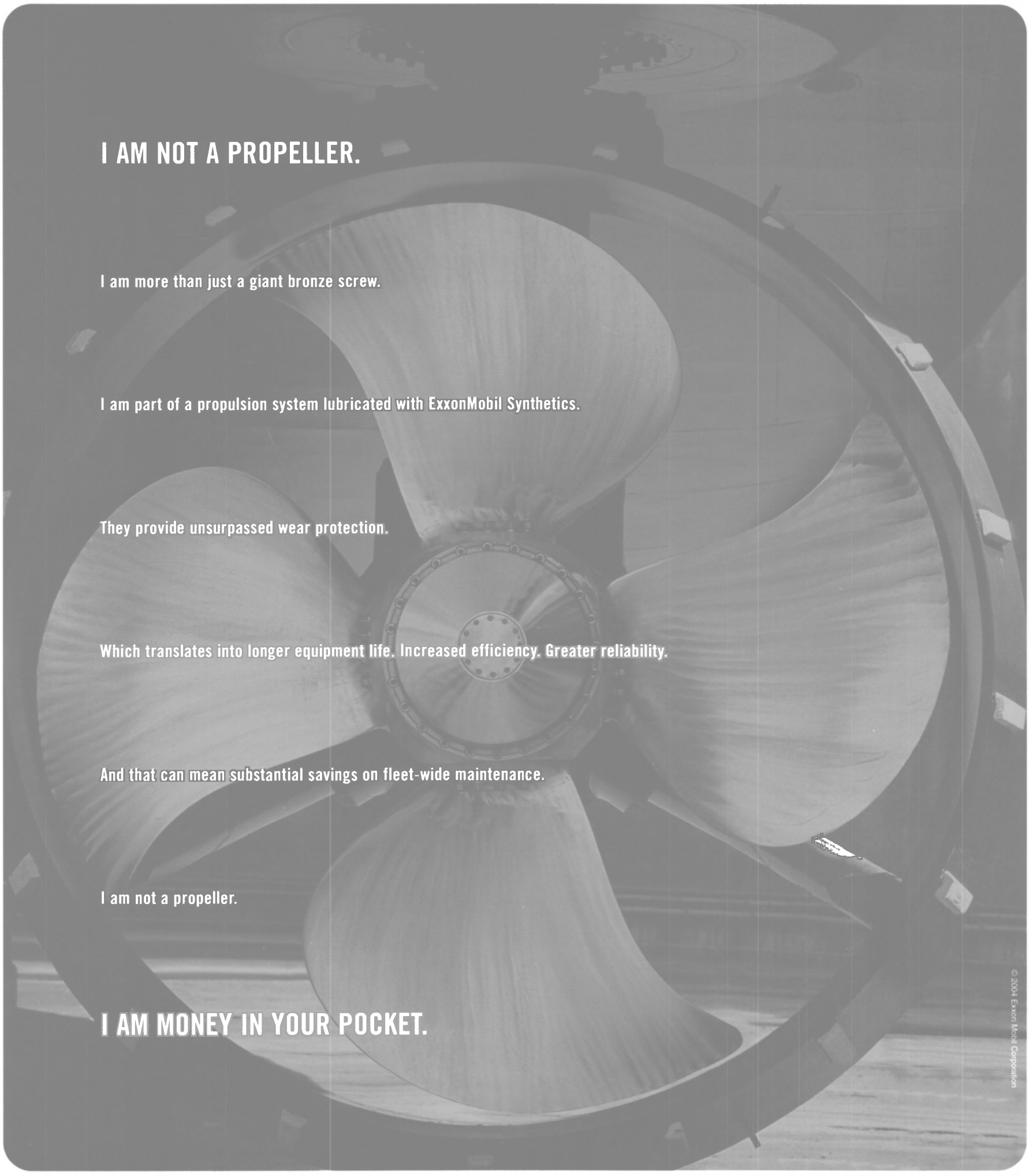

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