

# MARITIME REPORTER AND ENGINEERING NEWS

Passenger Vessel Market 2001

# Set to Fly High



**Full Steam Ahead** — **The Diesel Evolution**

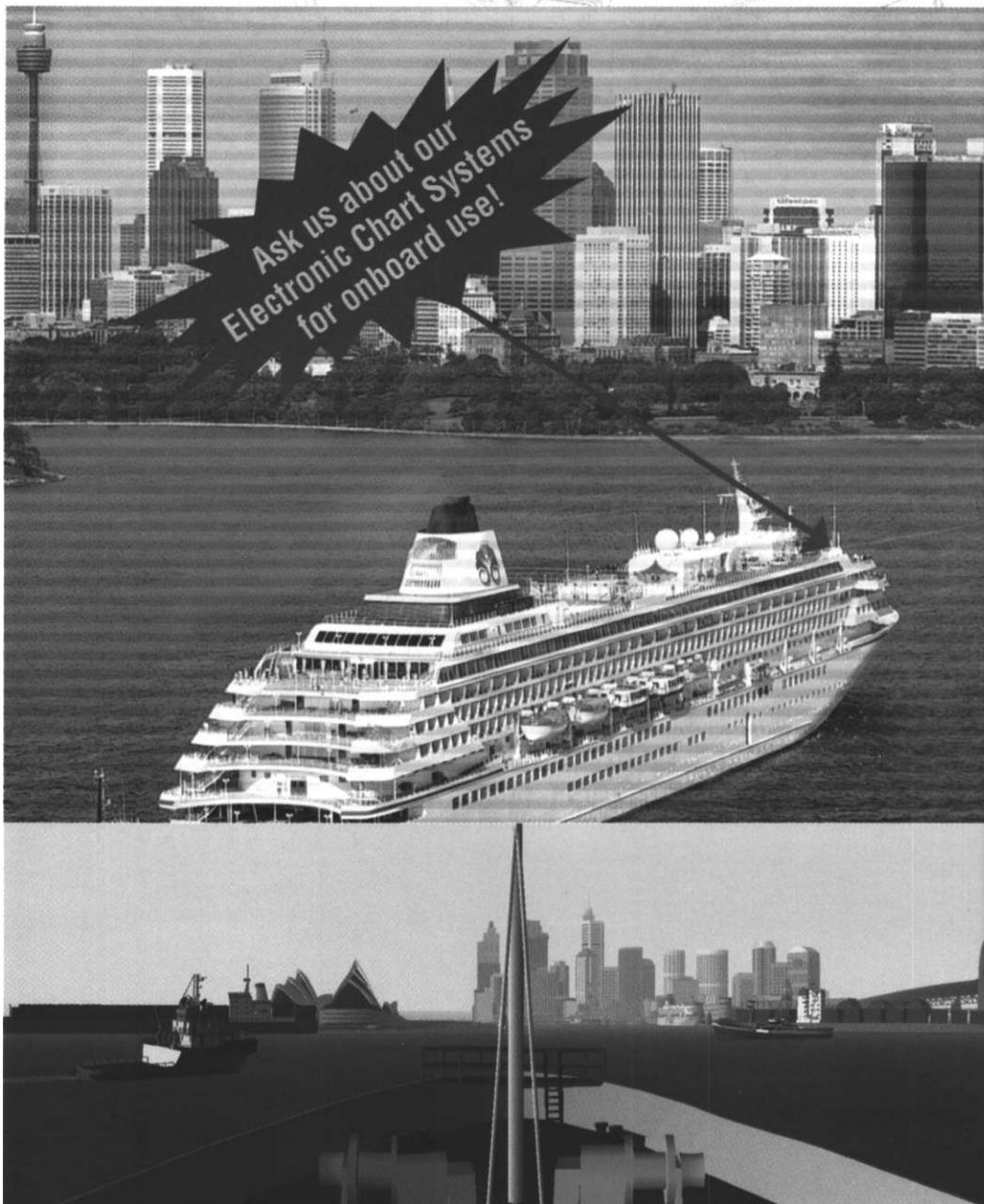
The new head of Rolls-Royce's marine division intends to conquer the world

A University study melds high tech with theory to optimize diesel engine performance

Australian Report • CAD/CAM Report • Marine Electronics: Monitoring & Control  
Ship's Store: Marine Propulsion Equipment • 2000: The Year in Statistics

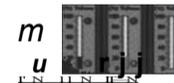
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Founder: John J. O'Malley 1905 - 1980  
Charles P. O'Malley 1928 - 2000

On the Cover: Maui Magic, built by Kvichak Marine Industries for Maui Classic Charters, is a 54-ft. (16.4-m) all-aluminum catamaran for operation out of Maalaea Harbor. The vessel was designed by Morrelli & Melvin (San Diego), and is USCG approved for 71 passengers. It is powered by twin Cummins 6CTA diesel engines driving through ZF gears. See passenger vessel coverage starting on page 26

### 8 Irish Innovation

Irish Ferries new 50,000-gt Ulysses embodies Nordic ferry technology prowess with Irish business verve.

— by David Tinsley

### 10 Down Under Meets Down South

World-renowned fast craft builders Incat and Austal Ships have fortified their presence in America, with deals in the Gulf of Mexico region poised to reap big dividends.

### 36 CAD/CAM: High Tech Tools

The cost savings and efficiencies of CAD/CAM are accessible to even the smallest boatyards.

### 42 On A Roll(s)

Rolls-Royce has quickly become one of the most prolific suppliers of marine propulsion systems. Dr. Saul Lanyado, the new head of its marine division, is set on taking the company to new technological heights.

— by Greg Trauthwein

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A university study is melding the latest computer technology with the Theory of Evolution to optimize diesel engine performance.

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## In Memory of Charles P. O'Malley

Charles P. O'Malley, long-time publisher of *Maritime Reporter & Engineering News* and resident of Floral Park, NY, passed away on December 27, 2000. Mr. O'Malley's career as an advertising and publishing executive spanned more than 50 years. Mr. O'Malley began his career at the famous Ellington and Co. advertising agency as a copywriter and later worked at Doremus & Co. as an Account Executive. He then joined the publishing firm of Maritime Activity Reports as Advertising Sales Manager. In 1980, he became Publisher. During his tenure, the firm's flagship publication, *Maritime Reporter and Engineering News*, grew to become the world's largest circulation magazine serving the Maritime industry. Mr. O'Malley was a long-time member of the Camp fire Club of America and an avid conservationist, hunter and gun collector. He is survived by his wife of 50 years, Janet; his daughter, Ellen; and son John, as well as by his brother, John and his six grandchildren — Kate Hemmer, Sarah Gorman, and Kristen, Mark, Jeffrey and Amanda O'Malley

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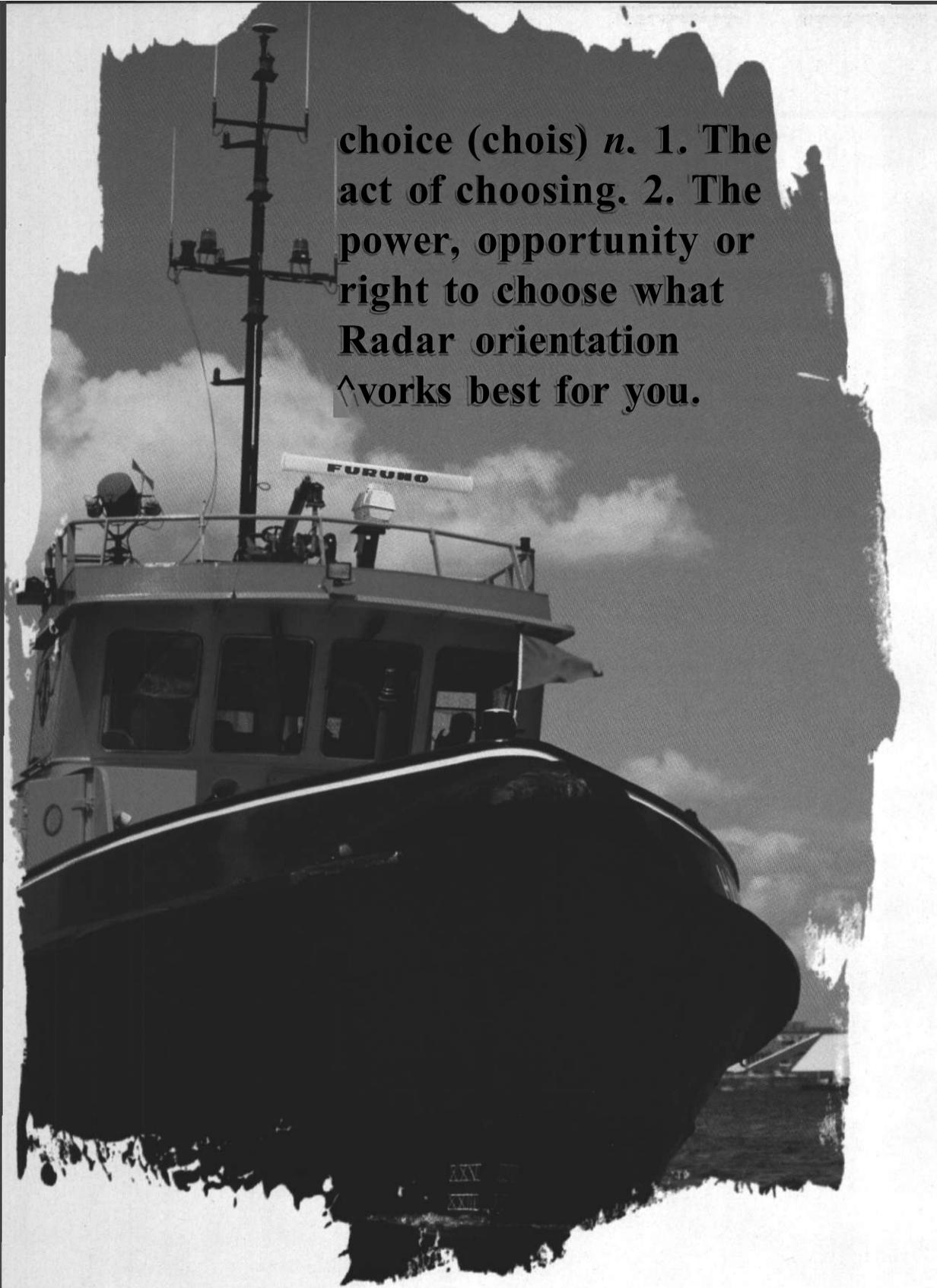
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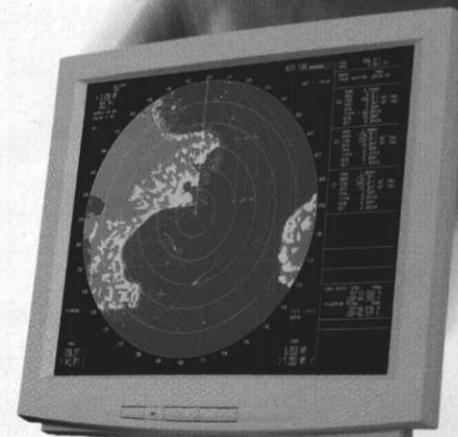
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## Editor's Note

The image of a fun-loving boat full of passengers in Hawaii may provide the slightest bit of wintertime relief for those of us snowbound in the Northeast U.S., but it also could be seen as a harbinger for good times to come in the passenger vessel sector of the marine market.



The spectre of a robust passenger vessel market — particularly for fast craft — has loomed on the yearly planning agenda of nearly every marine related company for many years. The anticipated "boom", as we like to call them, has yet to fully materialize, but the prospect of increased ferry utilization and activity in North America continues to grow.

Giving credence to this possibility are developments in the Gulf of Mexico region, which now is playing host to two of the world's most prolific builders of fast craft, Austal Ships and Incat, both hailing from Australia. Austal Ships efforts, with Bender Shipbuilding, to construct a new shipyard in Mobile, Ala., thus combining the construction prowess and proven designs of Austal with the state of the art steel processing facilities at Bender and the enormity of the U.S. market is a sure sign that good times are just ahead. To confirm that, it was announced in early December that Incat and Bollinger Shipyards — one of the most dominant boatbuilding power in the GOM today — had signed an agreement for Bollinger to market and build high speed craft to the Incat design.

To those in the industry who may still harbor fears of change, the message is abundantly clear: get over and jump on for the ride. The business of continuing consolidation (see "Northrop Grumman to Acquire Litton Industries for \$5.1B" and "Blount-Barker Shipbuilding Formed" and "The Doctor Is In" on pages 20, 26 and 42, respectively, of this edition) has been firmly embraced and incorporated into the maritime market. The trend towards bigger is better is clearly cyclical and could reverse at any given moment, but the run towards consolidated R&D, products, systems, has been firmly entrenched for more than seven years and current signs are that it will continue. The challenge, as always, is to develop, manufacture, install and service superior solutions for vessels both large and small, far and near.

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# Innovation on the Irish Sea

Nordic prowess in ferry technology, coupled with Irish business verve, is set to take the sector to a new highpoint as regards the concentration of wheeled freight capacity in a RoRo passenger vessel. Built in the cruise ferry mold, Irish Ferries' 50,000-gt Ulysses embodies 4,100 lane-meters of garaging for trucks on four decks. The vessel is an eloquent testament to the operator's robust traffic development, and its perception of new opportunities arising from unprecedented growth in the Irish economy, foreign trade and tourism.

Although P&O North Sea Ferries' 60,600-gt Pride of Rotterdam, nearing completion at Fincantieri's Marghera yard, will assume the mantle during the spring as the world's largest cruise ferry, her RoRo intake will be less than Ulysses' record-breaking vehicle laneage. Irish Ferries has eschewed the more workaday RoPax (RoRo passenger) designation in favor of the cruise ferry appellation, considered more in keeping with the nature and quality of its new ship's passenger facilities. The epically named vessel will be phased into service between Dublin City and Holyhead.

Despite the arrangement of two of the trailer-fitted decks comparatively high up in the ship, above main deck level, and the surmounting passenger accommodation spaces and public areas, the design offers the requisite stability in all weather conditions. This is due in no small part to a beam that is just one meter short of the Panamax gauge.

Ulysses signals a further step change in the Irish Sea transportation network, as did the introduction of the revolutionary HSS (high-speed sea service) catamaran RoRo Stena Explorer in 1996. Common to the disparate designs, besides their allocation to the central corridor between Ireland and Britain, has been their yard of build. Like the HSS series, Ulysses demonstrates Aker Finnyards' capacity for innovation and also puts down a new marker for Finnish shipbuilding in an ever-more competitive scenario.

The Irish project denotes a major new phase in the Finnish builder's business development, with its current focus on bespoke ferries and possible re-entry to the cruise market. The production program beyond Ulysses includes a 32,000 gt passenger-vehicle ferry for SeaFrance

and a 40,000 gt Baltic cruise ferry for Estonian Shipping. Among the provisional contracts, which the Rauma yard was hoping to formalize at the time of writing, was a requirement for two 12,000 gt ferries to serve the traffic between the Scottish mainland and Shetland. As previously demonstrated by Irish Ferries' introduction of the van der Giessen-de Noord-built vessels Isle of Innisfree and Isle of Inishmore, commissioned in 1995 and 1997, the latest investment in carefully conceived, high-grade tonnage provides the basis for increasing the company's share of a growing, but rigorously competitive short-sea market. Ulysses has been dimensioned for continued development of Irish export an import freight volumes, not only with the U.K. but also continental Europe, using the British mainland as a landbridge.

The scope for placing commercial vehicles anywhere throughout the four trailer decks, and the possibility to sail with the lower hold or tank top empty of freight, or perhaps with a lighter load of factory-new cars, attests to the operational versatility of the drive-through vessel. While it is a formidable freight carrier in its own right, the companion provision for the car-accompanied passenger market is expressed in the high standard of facilities atop the garage spaces. Ulysses' passenger accommodation, designed for 1,900 persons, mirrors Irish style and Scandinavian craftsmanship. Facilities available during the three-hour passage include a shopping mall, restaurants, cinemas and a large pub, while a novel feature for this type of ferry is the configuration of the forward part of deck 11 as an observation deck.

Besides the fixed trailer decks, cars can be accommodated on hoistable platforms available over much of the uppermost RoRo deck, making for a total of five RoRo levels throughout the ship.

Although born in the Finnish domain, a key source of medium-speed diesel technology, Ulysses provides a new reference for German four-stroke power. A bank of four MaK 9M43 engines from Caterpillar's German stable give a total propulsive effect of 31,200-kW, to give a service speed of 22 knots and the requisite margin to better ensure scheduling dependability in waters prone to rigorous weather. The particular demands of

maneuvering such a vessel on the Liffey and its approaches, and in and out of Holyhead harbor, are reflected in an outfit that includes 9,600 kW of thruster capacity, vested in three tunnel units in the bow and one aft.

## Genoese Regeneration

In fostering a sleek new breed of RoPax ferry for Cretan operator Minoan Lines, Sestri Cantiere Navale has reached an important stage in its transition from a role as a versatile builder of mercantile vessels to a dedicated constructor of cruise ships.

The 1999 delivery of the 40,000-gt Italian cruise ferry Excelsior gave a measure of the Sestri yard's latent skills in passenger-carrying tonnage. However, the 37,000-gt Knossos Palace, the first in a series of four Minoan ferries from the Fincantieri subsidiary, confirms its drive towards ultimate specialization in the high-technology, capital-intensive domain of cruise vessel production. Readers of a certain age and memory might recall Sestri's earlier, major contribution to Genoese know-how in passengership design, construction and operation, an era which ended with the completion of the stylish Italian liner Michelangelo in 1965. Gracing Genoa's industrial waterfront immediately prior to her November 25 handover, Knossos Palace is a modern testament to the Fincantieri group's emergence as a world-leading force in the building of cruise ships and the larger types of RoPax ferry.

The completion of a further three, exceptionally fast RoPax ferries for Minoan will leave Sestri wholly-focused on cruise vessels, commencing with a pair of 105,000-gt newbuildings for Carnival Corp.'s Costa Crociere.

Sestri's re-orientation, a process, which will be supported by expenditure in excess of Lire 100-billion on yard re-equipping, will strengthen Fincantieri's hand among a world elite confident of sustained growth in the cruise business. With Genoa-Sestri's capacity augmenting that of the Monfalcone and Venice-Marghera establishments, nominated centers for cruise ship construction; Fincantieri will have the extra muscle to raise its game.



by David Tinsley,

## Coast Guard Announces Marine Casually Reporting Requirements

By Duncan C. Smith III, James S.W. Drewry and Jennifer M. Southwick, Dyer Ellis & Joseph

On Thursday, November 2, 2000, the U.S. Coast Guard published a notice of proposed rulemaking (NPRM) regarding marine casualty reporting requirements. The proposed rule would amend the marine casualty reporting requirements by adding "significant harm to the environment" to the list of reportable marine casualties. This proposed change would implement a change in law enacted as part of the Oil Pollution Act of 1990 (OPA 90), it would apply to domestic vessels worldwide, to foreign vessels operating in the navigable waters of the United States, and to foreign tank vessels operating in the U.S. Exclusive Economic Zone (EEZ) and other waters subject to the jurisdiction of the United States.

### Background

Before this change in the law was enacted as part of OPA 90, the Coast Guard was not authorized to investigate a discharge or threatened discharge of oil, hazardous substances, marine pollutants, or noxious liquid substances (NLS) under its marine casualty investigation authority (46 U.S.C. 63 and 46 CFR part 4) unless certain conditions existed. The Coast Guard could act only if the discharge or threatened discharge resulted from a grounding, collision, or another incident involving death or serious injury to an individual, material loss

of property, or material damage affecting the seaworthiness or efficiency of the vessel. Also, before OPA 90's enactment, foreign vessels were not required to report marine casualties that occurred beyond the U.S. territorial sea.

### OPA 90 Changes

Section 4106 of OPA 90 altered this by making specific changes to the Coast Guard's authority. First, it added "significant harm to the environment" to the list of marine casualties (46 U.S.C. 6101(a)) that must be reported to the Coast Guard. Further, section 4106 not only increased the scope of reportable marine casualties, but it also amended the law (46 U.S.C. 6101) to require foreign-flag tank vessels to report certain marine casualties in the EEZ. The OPA 90 amendment requires foreign tankers to report "material damage affecting the seaworthiness or efficiency of the vessel" and "significant harm to the environment" in waters subject to the jurisdiction of the United States. However, the amendment states that this new reporting requirement applies to foreign tank vessels only to the extent consistent with generally recognized principles of international law."

### Coast Guard Rulemaking

The principal task for the Coast Guard in implementing these two OPA 90 amendments was to define in regulations the meaning of "significant harm to the environment." The Coast Guard's NPRM defines "significant harm to the

environment" as a discharge that, if it occurred in the U.S. territorial sea or other U.S. navigable waters, would be in violation of the Clean Water Act. In the preamble to the NPRM, the Coast Guard explains that under the Clean Water Act, the Coast Guard is authorized "to ensure the effective and immediate removal of a discharge, and mitigation or prevention of a substantial threat of a discharge, of oil, hazardous substances, marine pollutants, or NLS into or on the navigable waters of the U.S., or into or on the waters of the U.S. EEZ." From this, the Coast Guard concludes, "it is reasonable to infer congressional intent that the Coast Guard be notified any time there is a discharge or a substantial threat of a discharge into or on the navigable waters of the U.S. or EEZ in order to ensure the effective and immediate removal and mitigation or prevention of a discharge or substantial threat of a discharge."

The Coast Guard NPRM preamble goes on to point out that "most foreign-flag tank vessels" are already required to comply with the reporting requirements of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78). In the NPRM the Coast Guard equates "the term 'substantial threat of a discharge' to the term 'probable discharge' as used in the MARPOL 73/78 Convention." Therefore, the NPRM proposes to permit a report under MARPOL 73/78 of discharges or probable discharges to satisfy

the marine casualty reporting requirements of U.S. regulations (46 CFR part 4). However, marine casualty reports under those regulations will not satisfy the requirements of MARPOL 73/78 because the prescribed criteria and reporting requirements of the marine casualty regulations are not stringent enough.

The proposed rule would revise the regulations on marine casualties and investigations and the regulations (33 CFR part 151) implementing the Act to Prevent Pollution from Ships (APPS), which provides the reporting requirements for MARPOL 73/78. The revisions of the APPS regulations reflect a 1991 amendment to APPS and the ratification of Annex III of MARPOL 73/78.

### Conclusion

This regulatory effort by the U.S. Coast Guard has the surface appearance of being somewhat routine and merely a long overdue implementation of an OPA 90 mandate.

However, weaving the changes made by OPA 90 into the fabric of existing national and international law has proven to be tricky on more than one occasion. Care should be taken to examine the changes proposed. Thus, both domestic and foreign vessel owners and operators should take heed of this notice to ensure that unintended burdens or requirements are not imposed. Comments are due on or before January 31, 2001.

## \$29.9M Approved For U.S. Shipbuilding Loan Guarantees

Congress has approved \$29.9 million for the Maritime Loan Guarantee Program, or Title XI program, a \$27.9 million increase over the President's Fiscal Year 2001 budget request. **Allen Walker**, president of the Shipbuilders Council of America (SCA) and chairman of the Title XI Coalition, said, "We're pleased that Congress has recognized that the Title XI program is an important component of our nation's maritime policy and has agreed to significantly increase funding levels over those requested by President Clinton in his Fiscal Year 2001 budget. "Thanks to the strong Congressional support for this program, \$29.9 million in new money will be available to facilitate hundreds of millions of dollars in new ship construction, creating thousands of shipyard and seagoing jobs," Walker said. "However, even with

this increase, funding has reached a historical low. We hope that the next Administration recognizes the program is at a critical juncture and proposes sufficient funding levels to enhance the viability of the Title XI program."

The Clinton Administration recommended only \$2 million for Title XI loan guarantees in its FY 2001 budget. The Title XI Coalition and others in the U.S. maritime industry lobbied Congress to significantly increase funding for the Title XI program above the President's request. As a result of the industry's efforts, the House and the Senate appropriated \$10.6 million and \$20.4 million, respectively, for the Title XI program in the Commerce, Justice, and State, the Judiciary and related agencies appropriations bill for Fiscal Year 2001. The conferees on the bill finally agreed to

increase funding to \$30 million, well above the President's request. To meet its budgetary requirements, however, Congress, in a subsequent bill, imposed government-wide rescissions of .22 percent, effectively lowering the appropriation level for Title XI to \$29.9 million.

An additional \$3.97 million was appropriated to the Maritime Administration for administrative expenses to carry out the guaranteed loan program. "While Congress has provided \$29.9 million for Title XI, we are still concerned that without adequate funds in future budgets many important shipbuilding projects will languish," Walker said. "An important first step next year is for the Administration to request an adequate funding level in Fiscal Year 2002 for Title XI, which we believe should be at least \$50 million."

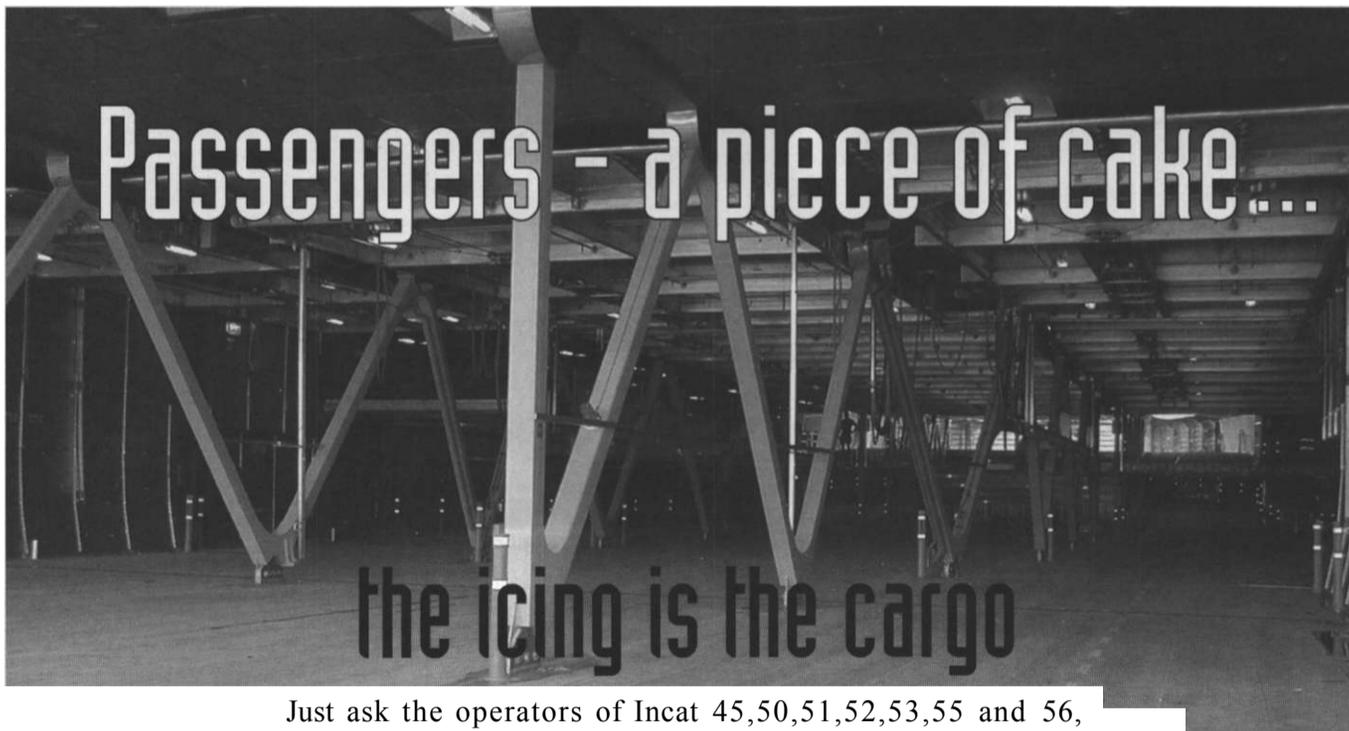
# Southern Hospitality

*The teaming of Austal Ships and Bender Shipbuilding to construct, from the ground up, a world-class aluminum vessel construction facility in Mobile, Ala., highlights the level of investment mid-tier U.S. yards have made in the past five years.*

*Austal, which is well regarded for its fast craft design and construction prowess, will have at its disposal arguably one of the finest plate production facilities in the country, as well as access to a market for its signature craft, which is seemingly poised to boom. The two companies, however found that through a melding of similar ideas — both on a philosophical and financial level — that they could assimilate their cultural and business practices to form what aspires to become the largest aluminum shipbuilding company in the U.S. — Austal USA. Currently being constructed in the heart of the Bayou shipbuilding mecca of Mobile, Ala., the new company's main building is nearing completion. Measuring 360 x 90 x 113 ft. (109.7 x 27.4 x 34.4 m), this focal point of Austal's new venture will have the capabilities of constructing two 164 ft. (50 m) fast catamarans end to end simultaneously or up to one 262 ft. (80 m) catamaran car/passenger ferry.*



The first of the construction sheds being built at the Austal USA shipyard in Mobile, Ala. The building is scheduled for completion sometime after the start of the new year.



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By Regina P. Ciardiello,  
associate editor

It is not everyday that downtown Mobile, Ala. gets a new addition to its skyline. Not only is the new Austal/Bender venture bringing in additional jobs and added revenue to both the city and the State of Alabama, but an added bonus is that the creation of Austal USA has physically become part of the downtown Mobile scene as its main building is prominently featured within the city skyline. Located a stone's throw from Mobile's Convention Center, the gantry cranes that fly atop the new company's main building are visible from miles away.

While this is pleasing to Austal USA from a design standpoint, it has surprisingly been a factor in adding to its workforce. According to **Bill Pfister**, Austal USA's vice president, Marketing & Administration, many area residents view this new structure while driving through the downtown area and see it as a possible employment opportunity. If they have the experience that the company is looking for — perhaps they held previous positions in welding or fabrication — then they might have just landed themselves a job — all because they were curious about this new piece of the Mobile skyline.

This is beneficial to both the employees and the shipyard, as it promotes local employment, which in turn will

## Incat Signs Deal With Bollinger

In a move which signals the long-awaited fast craft boom in the U.S. is about to begin, Bollinger Shipyards, Lockport, La., and Incat Australia Pty. signed an agreement for Bollinger to market and build high speed craft to Incat designs in the U.S. The deal is significant in that earlier this year chief Incat rival Austal Ships struck a deal with Mobile, Ala.-based Bender Shipbuilding to build a new shipyard in Mobile for the same purpose.

Incat is privately owned and is the innovator and builder of the world speed record holding Wave Piercing and K Class aluminum catamarans. The 27 year-old company has built over 30, or approximately 40 percent of the worldwide fleet of high-speed passenger ferries over 230 ft. (70 m) in length. Incat currently has 12 models ranging from 242 ft. (74 m) to 393 ft. (120 m). Incats are now operating in England, Europe, the Mediterranean, North and South America, Asia, Australia and New Zealand.

**Chris Bollinger**, executive vice president of Bollinger said, "This accord is a natural for us, not only because of Bollinger and Incat's leadership in our respective fields, but because both companies are privately held and share many of the same philosophies. Incat has the same dedication to high quality work and a family atmosphere that we have at Bollinger. Their "keep it light" design and manufacturing processes mesh very well with our own."

The two companies have been working closely on a proposal to an unnamed customer for a unique wave-piercing vessel that can carry 500 passengers and a variety of vehicles at speeds of more than 40 knots. The design is similar to the Incat Tasmania, which was chartered by the Australian Trade Commission during the 2000 Summer Olympics in Sydney, Australia. Its design includes two slender, aluminum hulls connected by a bridging section with a center bow structure at the forward end. It should be noted that this design developed by Incat Australia is a different company than INCAT Designs who developed the design for the BC Ferries.

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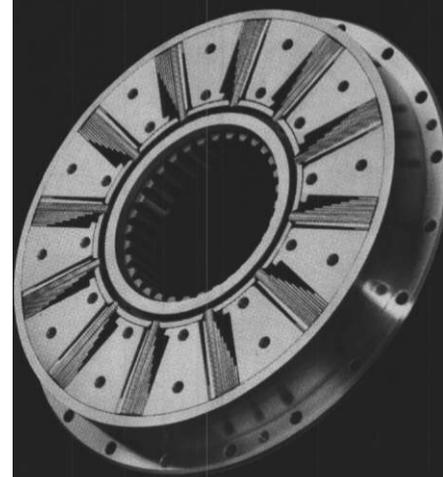


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John Rothwell, chairman of Austal Ships sees the alliance with Bender Shipbuilding as a sound investment for the future of aluminum shipbuilding in the U.S.

bring Austal USA closer to its goal of 1,000+ workers within five years. A number that Austal Ships group chairman **John Rothwell** hopes will be achieved sooner than later. It is safe to say that sooner is probably the operative word since the yard, aspires to hold 500 employees by the end of 2002.

#### The Beginning of a Franchise

The story of the Austal Bender alliance begins with the parent company, Austal Ships, venturing to the U.S. in search of a yard with which to establish a partnership. This quest was led by group chairman Rothwell, who saw a market for aluminum ship construction

in the U.S. With his headquarters located worlds apart in Western Australia, the company was looking to expand upon its shipbuilding expertise by branching out from its mostly European exports. While Austal is a leader in fast ferry construction for this market that relies heavily on ferry transport across its seas and channels, the company wanted to grab hold of the U.S. shipbuilding market, but was prohibited from doing so because of the Jones Act.

While Austal Ships has also enjoyed positive relationships in its home state with the construction of patrol and police vessels for the Australian Customs Service and Navy, most recently the three police boats that were constructed this summer for the New South Wales Police Service by subsidiary Image Marine (see *MR/EN* September 2000), the company wanted to position itself to profit from the lucrative U.S. defense market. In fact, Rothwell, who spoke with *MR/EN* from Austal's head office down under, shared that he traveled to Washington, D.C. on a variety of occasions with both Pfister and **Tom Bender**, Bender Shipbuilding's president to attend workshops at the U.S. Navy's Carderock Division that dealt with high speed freighters for military use — something that Austal USA hopes to add to its repertoire.

On discussing Bender Shipbuilding as his choice, Rothwell, who established Austal Ships in 1988, spoke of his immense trust and respect for both company president Bender, and **Bruce Croushore**, the yard's V.P./general counsel as one of the deciding factors in his decision to team up with the yard.

"I talked with many yards in the Southern U.S. and felt that we didn't meld with them," Rothwell said. "When I met Bruce (Croushore) and Tom (Bender), I thought them to be very astute and knowledgeable of their craft as well as financial control — they were honest in a sense that it was 'what you see is what you get'." "We are pleased with our partnership with Bender," he added.

The new U.S. outlet's premiere project is a spec vessel that is scheduled for completion this summer. Currently being constructed at a site that is temporarily being leased by Austal until the main shed is complete at the beginning of 2001, the 82 ft. (25 m) vessel that is able to move at 26-27 knots, will be constructed as a passenger ferry that will house propellers instead of waterjets. While the vessel is not being built to specific owner requirements, Pfister cited that there is no doubt in his mind that suitable buyer will come forward. His high confidence level stems from the fact that several would-be owners have come forward expressing interest

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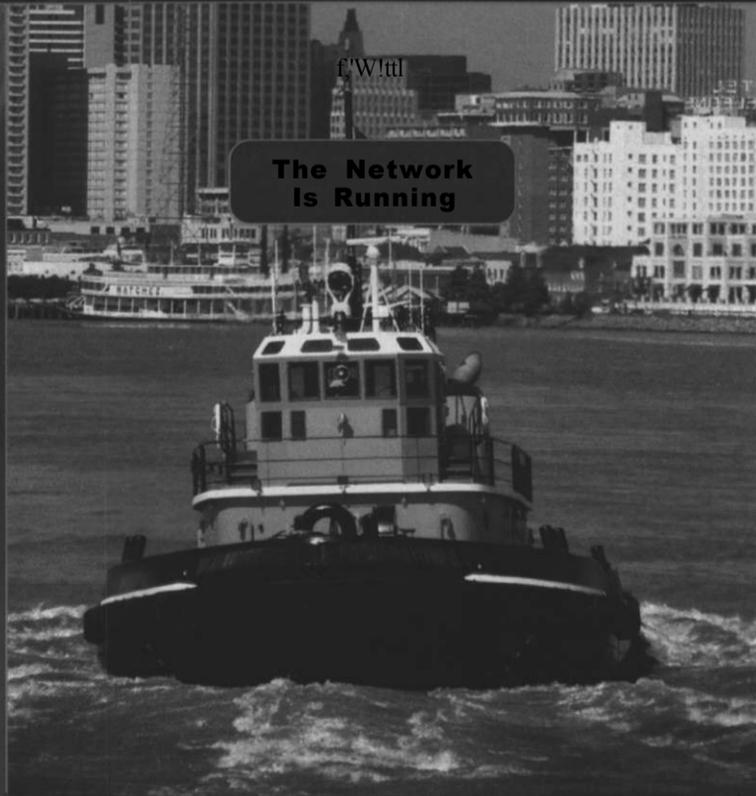
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that they want to add to their fleets. While the project's main particulars are not set in stone, Pfister did express that the ferry's design, which will be completed by Austal's own designers in Australia, will boast a color scheme of blue, orange and yellow hues. While he wasn't at liberty to discuss specific names of probable buyers, he did mention that one specified that the vessel be equipped with seats manufactured by the Australian-based company named Berteaux.

Circle 30 on Reader Service Card

### New Vessel Delivered To Tranz Rail

Tranz Rail has acquired The Lynx, formerly known as Incat Tasmania, after a comprehensive strategic review of its fleet configuration. Previously Tranz Rail chartered earlier generation Incat-



built vessels from U.K. operator Condor Ferries to meet the needs of a seasonal fast ferry service. The Lynx entered service between Wellington and Picton on December 10 and extended Tranz Rail's fast ferry operation to a year round service and, with commercial vehicle capacity available enabled the withdrawal of a 28-year-old conventional freight ferry.

Returning as a year-round service, the (98 m) Evolution 10B Class ferry, which as 380 lane m capacity for vehicles, has been long term chartered by Tranz Rail. Beginning this February, when terminal facilities are completed in Wellington, The Lynx will be also be able to carry commercial vehicles.

The Evolution 10B class extends Incat's 10-year history in the production of high speed Wave Piercing ferries and delivers proven technology in a vessel capable of carrying a mix of passengers and freight at speeds over 40 knots. The vessel's retractable "T-foil" on its center hull is designed to give a smooth ride in rough seas, such as can be experienced on Cook Strait. This summer, Lynx will be doing only two return sailings a day due to the 18-knot speed limit in the Marlborough Sounds.

Lynx was due to arrive in Wellington on November 27.

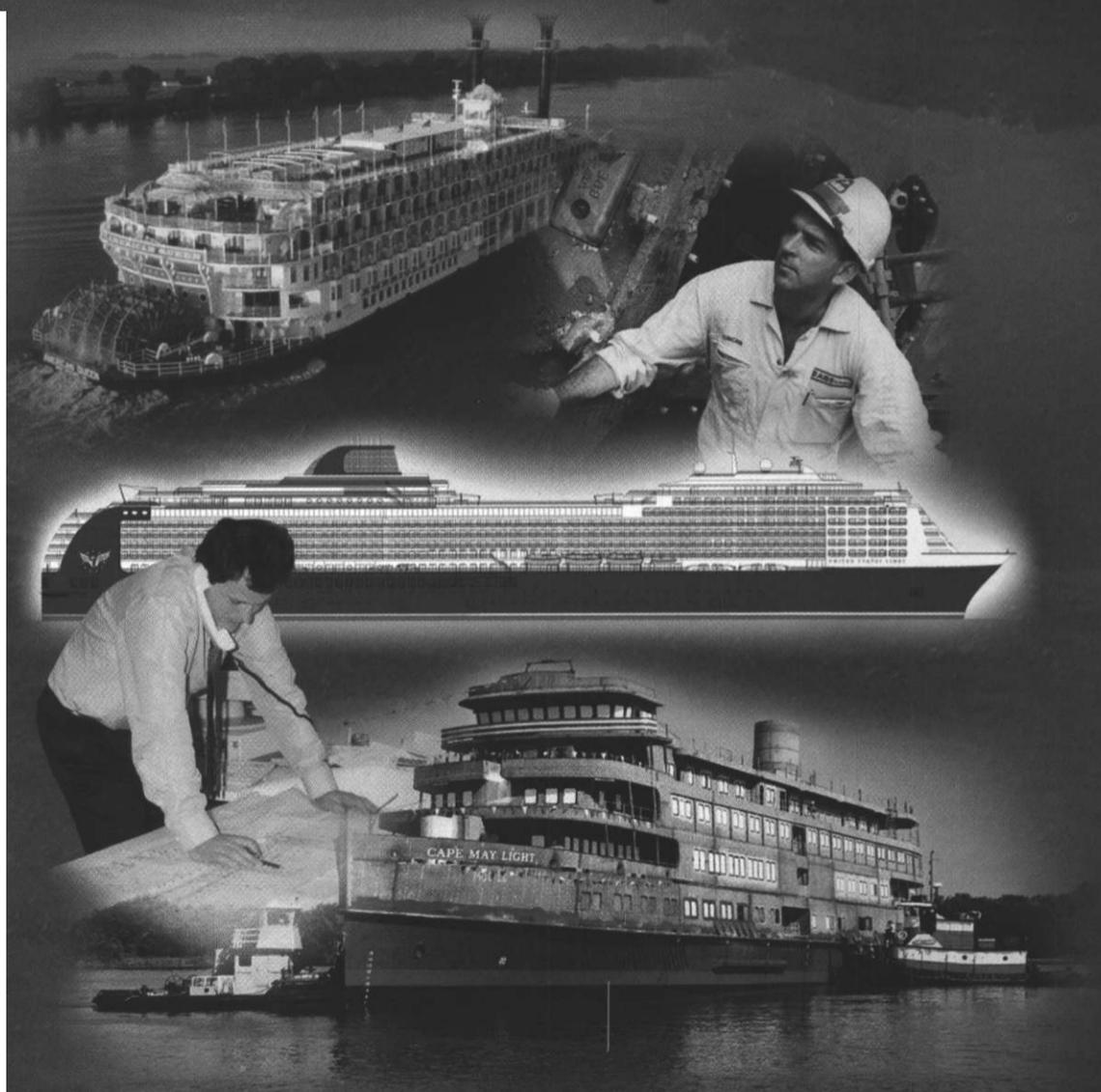
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## Australia

### Image Marine Delivers Cruise Catamaran for Private Operation

Image Marine has delivered White Rabbit, a 118 ft. (36m)-cruise catamaran for private operation in Asia.

Image has a background in supplying high quality customized vessels to the commercial live-abroad sector, however, White Rabbit is the first to be built exclusively for private operation.

With a cruising speed of approximately 20 knots, the vessel is based in Singapore and will be used for coastal cruising to destinations such as the Philippines, Indonesia and the Asian Region.

Facilities aboard the White Rabbit are spread throughout two decks with the spacious upper deck dedicated to the owner's suite, bridge and captain's cabin. Custom designed to meet the needs of the owner, the master suite features full-length windows on both sides of the room to optimize ocean views.

Accommodating 12 guests, (six located in the main deck and six in the port hull), White Rabbit accommodates five crewmembers in four twin bunks (located in the hulls) with communal bathroom facilities. The captain's cabin is located directly aft the wheelhouse accommodates two and has a private ensuite and study area. Other crew amenities include a mess area also located in the hulls.

The main deck aboard White Rabbit is

focused for onboard entertainment with a dining area seating 10, a bar and large lounge, and entertainment area. The interior features "Tropicane" style furniture throughout with a mixture of soft neutral colors — shades of blue and yellow. Located parallel to the dining area is a spacious, well-equipped galley with adjoining breakfast bar. A small study station is located aft of the lounge area in addition to ample storage space throughout. Entertaining is also extended to the upper deck fly bridge with an outdoor seating area and space for deck chairs and sun lounges.

The catamaran also features water sports and recreational entertainment with the provision of two jet skis located forward on the main deck and two 17 ft. (5.3m) Aquapro rigid inflatable tender vessels located aft on the main deck. Both the jet skis and tender vessels can be launched via a manual davit system and used for general transport purposes. Kencord marine carpet is featured in all outdoor deck areas.

Additional features aboard the vessel include a Sontech Surecom intercom system throughout, a fully equipped laundry and storage space for perishables (located in the hulls) and additional refrigeration/freezer facilities.

White Rabbit can be operated from

one central helm with four viewing stations wash with access to a fish finder. Some of the extensive electronics equipment featured in the vessel's wheelhouse includes a Saura AT3000 Auto Pilot, Furuno FCV600L echo sounder, Saura magnetic compass and two Furuno 1832 band radars.

Safety equipment includes two 'RFD' Survival 20 person self-inflating life rafts complete with hydrostatic releases, chocks, and conforms to SOLAS requirements. Ample lifejackets for adults and children are provided, and the two 17 ft. (5.3m). Aquapro rigid inflatable tender vessels located aft on the main deck can function as rescue craft.

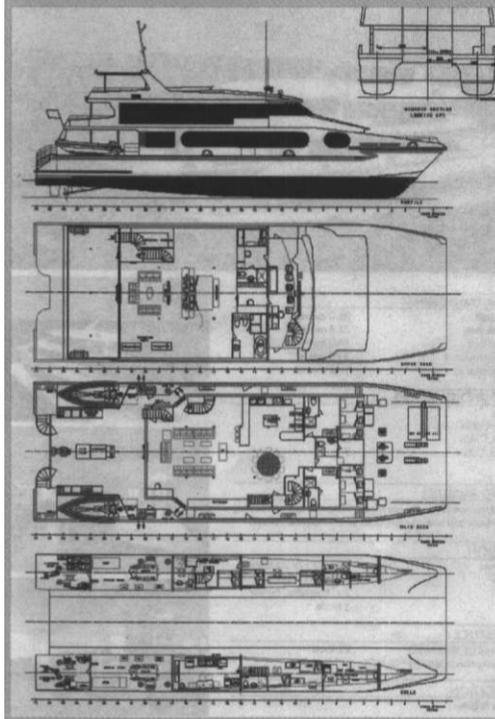
#### Circle 32 on Reader Service Card

#### Main Particulars -White Rabbit

Class	Lloyd's Ship Register
Length,(o.a.)	118 ft. (36 m)
Length, (w.l.)	106 ft. (32.4 m)
Beam, (molded)	39 ft. (12 m)
Hull Depth (molded)	12-ft. (3.7 m)
Hull Draft (approx.)	5-ft. (1.5 m)
Passengers:	12
Main Deck Cabin	4
Lower deck Cabin	6
Upper Deck Cabin	2
Crew:	5
Main Engines.	2x MTU 12V 2000M90
	2x ZF BW190A
Propellers	2x 'Veemstar"NiAlBr 5 blade



White Rabbit—the 118 ft. (36 m) cruise catamaran constructed by Image Marine for private operation in Asia — has a cruising speed of about 20 knots.



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The vessel is powered by a pair of MTU 12V 2000M90 engines driving ZF gearboxes.



An entertainment/lounge area is a prominent feature onboard White Rabbit.

Circle 227 on Reader Service Card

## Spain Creates Joint European Company

Spain is reported to be in talks with several shipbuilders in Europe to create a joint European company similar to the aerospace EADS, the chairman of Spain's state holding company (SEPI) said. After a presentation in Madrid of Spain's new civilian and military shipbuilder Izar, **Pedro Ferreras** said SEPI was already talking to groups in France, Germany and Italy.

"We want to begin working on projects common to European countries, like the model followed by the aerospace sector, but that takes time," he said, referring to the European Aeronautic Defense and Space Company (EADS). EADS was born from the merger of SEPI-controlled Casa, France's Aerospatiale Matra and Germany's DaimlerChrysler Aerospace. Izar, formed by the July merger of state-owned Bazan and Astilleros Espanoles, could be a role model for Europe's

money-losing shipbuilders and the motor behind a European project, Spanish Finance Minister **Cristobal Montoro** said. "Izar could be the point of reference and should be the impulse for a European naval project," he said. SEPI Chairman Ferreras added that the new group, the 10th largest shipbuilder in the world with a turnover of 225 billion pesetas (\$1.2 billion) and orders totaling 638 billion pesetas, could sign a deal with the German group Babcock Borsig. "We have a magnifi-

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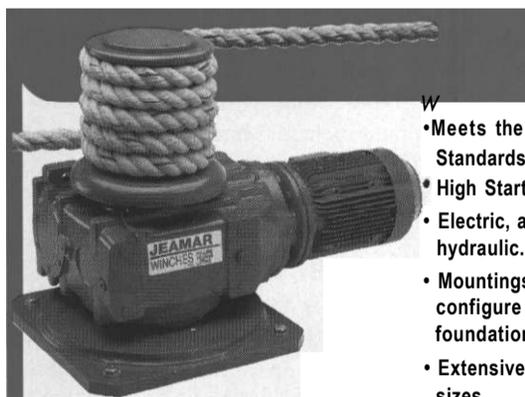
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January, 2001

## Crowley To Acquire MTC

Crowley agreed last month to acquire all of the outstanding shares of Marine Transport Corporation (MTC) for \$7 per share. The transaction is conditioned upon a minimum number of Marine Transport's shares being tendered, regulatory approvals, and other standard closing conditions. The tender offer is not conditioned upon financing.

"Our investment in Marine Transport is a unique opportunity for Crowley to add a complementary business line to our present maritime activities," said **Thomas B. Crowley, Jr.**, Chairman of the Board and CEO of Crowley. "It is our plan to allow Marine Transport to pursue its present strategic plan with its dedicated management and employees, supported by the joint resources of the combined companies. This is an historic event for the U.S. Maritime community in many respects, and we look forward to developing expanded growth opportunities with Marine Transport."

**Richard du Moulin**, Chairman and CEO of Marine Transport said, "We believe this transaction provides significant value realization to our existing stockholders. Crowley is one of the most well respected companies in our business. They know our industry and are deeply committed to it. We look forward to working together."

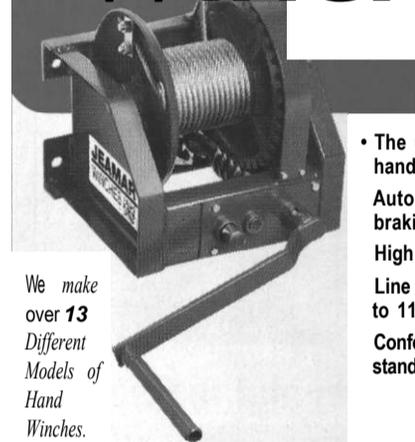
ING Barings LLC advised Marine Transport with respect to this transaction.

Oakland-based Crowley Maritime Corp., founded in 1892, is primarily a family- and employee-owned company engaged in integrated logistics, marine transportation and related services. The corporation, with more than 100 offices in major ports and cities around the world, has several operating subsidiaries, including Crowley Liner Services, Crowley Marine Services, Crowley Petroleum Transport and Crowley Logistics. Marine Transport Corporation is a U.S.-based supplier of marine transportation services, with one of the largest U.S.-based fleets of ocean going vessels.

Marine Transport's core business is industrial shipping with leading chemical and energy customers. Marine Transport's Houston-based operation, MTL Petrolink, provides crude oil lightering services in the Gulf of Mexico.

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15

## News

cent relation with them and we've started speaking about possible collaboration in the area of submarine building," he said. Earlier in the presentation he said state-owned Izar would break even in 2003 and make a profit of 5.0 billion pesetas (\$26.7 million) by 2005 after years of restructuring and heavy losses in the public-controlled industry.

### Cammell Laird Awaits

#### Costa Crociere Decision

At press time Merseyside shipbuilder Cammell Laird Pic was anxiously awaiting the outcome of its negotiations to bring the Costa Classica in for its conversion. The shipyard reported a number of proposals regarding the delayed

conversion of a cruise ship, Costa Classica, were being considered after meetings with the ship's owner Costa Crociere. Technical meetings relating to the proposals were also underway and the company could not predict the time scale or outcome of these discussions. Earlier in the month, Cammell Laird was reported to be hammering out a new

agreement to save the \$75.9 million cruise liner contract and protect a number of jobs. In November, the liner was due to arrive for refitting at the docks in Merseyside but then headed back to Genoa. Croce Crociere delayed the delivery because work at the shipyard was behind schedule. Cammell held a final meeting with the Department of Trade and Industry in relation to a further cruise ship contract.

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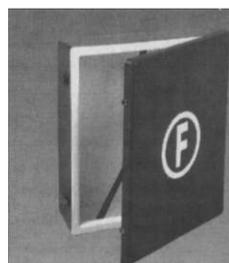
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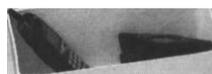


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### Transfennica Sale Cancelled

On June 28, 2000, an agreement was signed between the shareholders of Transfennica Ltd. and Finnlines Pic to sell Transfennica's shares to Finnlines. The sale required the approval of the relevant competition authorities. However, the conditions presented by the competition authorities, were such that Finnlines could not accept them. The partners have therefore decided to cancel the sale of the shares. Transfennica's shareholders are UPM-Kymmene Corporation (49.9% holding), Metsa-Serla Corporation (32.7%), Myllykoski Paper Oy (9%) and Oy Metsa-Botnia Ab (8.4%).

### Worldwide Offshore Rig

#### Utilization Drops

Worldwide rig utilization decreased the week ending December 15, according to Offshore Data Services (ODS). With 560 of the world's 647 mobile offshore drilling rigs under contract, worldwide offshore rig utilization fell 0.6 percent to 86.6 percent. The rig utilization rate in the U.S. Gulf of Mexico fell because of a one-rig decrease, bringing the number of mobile offshore drilling rigs in the Gulf under contract to 181 out of 207, bringing utilization down 0.9 percent to 87.4 percent. The European offshore rig count fell by one, with 87 of the 101 mobile offshore drilling rigs in the region under contract, pressuring utilization to down one percent to 86.1 percent, ODS said.

ODS' total worldwide offshore rig count includes changes in utilization and fleet size in regions beyond just the Gulf of Mexico and Europe.

### Kvaerner, Saipem Sign Deal

Kvaerner ASA said it has an intentional deal with Italian oilfield services company Saipem for a subsea umbilical project in the Gulf of Mexico. The deal, valued at about \$28 million, calls for Kvaerner to manufacture and supply production control, electrohydraulic steel tube umbilicals for the Canyon Express subsea development, in which Saipem is the main contractor, it said in a statement. The steel tube umbilicals will be manufactured by Kvaerner.

# Wartsila Puts More Sulzer RTA84T's On Large Tankers

For the year 2000, Wartsila Corporation reports that 24 Sulzer RTA84T low-speed diesel engines with an aggregate power output of 713.4 MW (970,800 bhp) have been ordered for installation in very large tankers contracted at shipyards in China, Japan and South Korea. The engines will all be built by licensees of Wartsila in Japan and Korea.

Altogether there are now 78 Sulzer RTA84T engines (including the -B and -D versions) delivered or on order, with a combined output of 2,171.9 MW (2.95 million bhp).

Ten 305,000 dwt oil tankers recently contracted in China and South Korea by National Iranian Tanker Co (MTC) will each be propelled by a seven-cylinder Sulzer RTA84T-B low-speed diesel engine. The engines will have a maximum continuous output of 27,160 kW (36,960 bhp) at 74 rpm, and give the ships a service speed of 15.5 knots.

Five of these VLCCs will be built at Dalian New Shipyard, China, with

delivery between December 2001 and December 2002. The other five will be built by Hyundai Heavy Industries Co. Ltd. at Ulsan, South Korea, with their delivery due during 2002.

## Eight VLCCs and ULCCs for Hellepont

Hellepont has contracted the first ULCCs to be ordered for many years. Hellepont recently placed orders for a total of four 442,500 dwt ULCCs at Daewoo Heavy Industries Ltd, as well as four 310,000 dwt VLCCs at Samsung Heavy Industries Co Ltd, both shipyards being in Korea.

The four ULCCs will each have a Sulzer 9RTA84T-D engine of 36,900 kW (50,220 bhp) MCR output to obtain a service speed of 16.5 knots. The four VLCCs will each be powered by a Sulzer 8RTA84T-D engine of 32,800 kW (44,640 bhp) MCR output, for a service speed of 17 knots. In addition, the ULCCs will each be equipped with three

Wartsila 9L20 auxiliary engines each of 1,530 kW output. The VLCCs will each have three 1,360 kW Wartsila 8L20 auxiliary engines. These auxiliary engines will be manufactured at Wartsila's Vaasa factory in Finland. Other transactions include a 280,000 dwt VLCC at Ishikawajima Harima Heavy Industries Co Ltd (IHI) for Shinwa Kaiun, which will be powered by a Sulzer 7RTA84T engine of 27,160 kW (36,960 bhp) output. The ship is due for delivery in December 2001.

Two 260,000 dwt tankers contracted by Formosa Plastics at IHI will each be equipped with a Sulzer 7RTA84T engine of 27,160 kW (36,960 bhp) output. NYK Line ordered two 300,000 dwt VLCCs at NKK Corp., which will each be powered by a Sulzer 7RTA84T engine of 27,160 kW (36,960 kW).

The ships are both due for delivery in 2002. A single 300,000 dwt VLCC has also been contracted by Iino Kaiun at IHI that will be equipped with a Sulzer

7RTA84T engine.

All six RTA84T engines ordered by Japanese shipyards will be built under license from Wartsila Corp. by Diesel United Ltd. The Sulzer RTA84T low-speed two-stroke diesel engine is specifically tailored for the propulsion needs of large tankers. It runs at low speeds (54 - 76 rpm) to match the optimum propeller speeds of such large ships.

As part-load fuel economy is important in ships which might have long periods of 'slow-steaming,' the RTA84T uses flexible engine setting through variable exhaust valve closing (VEC), load-dependent cylinder liner cooling, and variable fuel injection timing (VIT).

These features contribute to the RTA84T being the most economical propulsion engine for large tankers. It is manufactured in two versions, the RTA84T-B and the RTA84T-D with a higher power output. Available with five to nine cylinders, the RTA84T covers a power range of 19,400 to 36,900 kW.

## FGH And Ocean Rig Sign Cooperation Agreement

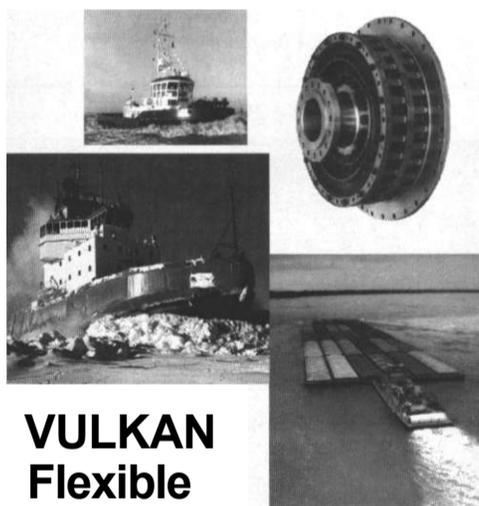
Friede Goldman Halter (FGH) and Ocean Rig have signed a cooperation agreement related to the completion and delivery of Ocean Rig's Bingo 9000-1 and Bingo 9000-2 offshore drilling rigs, which are currently being outfitted and Friede Goldman Offshore's Pascagoula, Miss, shipyard.

The agreement results from a joint effort of Friede Goldman and Ocean Rig to develop an acceptable plan and schedule for the completion and delivery of the two fifth-generation rigs, and marks a significant step as the two rigs near completion.

This decision establishes new delivery dates for the rigs, with a delivery date for Bingo 9000-1 set for March 2001, followed by Bingo 9000-2 on June 1, 2001.

Also outlined in the agreement is a specific incentive plan geared toward the completion of Bingo 9000-2. According to terms outlined in this plan, Ocean Rig will pay an incentive bonus of up to a total of \$5 million to Friede Goldman as Friede Goldman meets certain pre-determined progress targets at the end of each calendar month between now and April 15, 2001.

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## News

### NASSCO Lands \$68 Million Continuous Maintenance

NASSCO has received a contract from the U.S. Navy for continuous maintenance of the DD-963 and CG-47 ships homeported in San Diego. The contract, which includes the initial year and four

one-year options, is valued at approximately \$68 million. Advanced planning activities for the four DD-963 and six CG-47 ships will commence immediately to support repair and maintenance availabilities beginning in January 2001.

The DD-963 destroyers were developed for anti-submarine warfare, which

includes operating as an integral part of the battle group. These ships are designed to hunt down and destroy high-speed submarines, and can also be used to engage ships, aircraft and for land attack. The six CG-47 guided missile cruisers can perform sustained combat operations in any combination of anti-

air, anti-submarine and strike warfare environments.

### Port Of New Orleans Awards Gantry Crane Contract

The Board of Commissioner of New Orleans has granted a \$12.3 million contract for the construction and installation of two multi-purpose gantry cranes at the New Napoleon Container Terminal. The contract was awarded to the joint venture of IMPSA International, based in Pittsburgh, Pa. and IMPSA Port Systems based in Hong Kong in accordance with Louisiana bid law. The electrically-powered cranes, which will be fabricated in China for operation by February 2002, will be used in the movement of both containerized and general cargo. Each will hold a lifting capacity of 65 long tons under the spreader bar and 75 long tons under hook, with an outreach of 155 ft. (47.2 m).

### Scotline Marine And Tille Shipyards Sign Contract

Scotline Marine Holdings and Tille Shipyards signed a contract on November 15 for two new British-flagged Tille Traders 3300. The multipurpose dry cargo, containerships will be customized for Scotline's forest product trade between Scandinavian and U.K./Irish ports. The first vessel is scheduled for delivery at the end of September 2001 and the second during the beginning of 2002. Scotline also has the option for additional two vessels for delivery during 2002 and 2003.

Main Particulars	
Length, (o.a.) ...	295 ft. (89.9 m)
Length, (b.p.) ...	279 ft. (84.9 m)
Width	45 ft. (13.7 m)
Depth	20 ft. (6.2 m)
Draft	16 ft. (4.9 m)
DWT	
Container capacity	185 TEUs
Main engine ...	Wartsila type 6L26A
Speed	13 knots

### MSC Awards \$26 Million

#### Contract To American Overseas

Military Sealift Command (MSC) has granted a \$26 million contract to American Overseas Marine of Quincy, Mass. to operate and maintain Maritime Prepositioning Force (Enhanced) Ship — USNS Soderman — soon to be renamed USNS Gunnery Sgt. Fred W. Stockham — a WWI U.S. Marine Corps Medal of Honor recipient.

Stockham will join 14 other vessels in MSC's Maritime Prepositioning Force, all of which are specially configured to carry combat equipment and supplies for the U.S. Marine Corps. The ships can off-load their cargo at piers using

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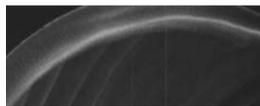
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## News

shore based cranes, or offshore using onboard Navy lighterage. An additional ship — called Maritime Prepositioning Force (Enhanced) Ship — is being added to each MPS Squadron to support the U.S. Marine Corps' at-sea prepositioning program.

### Joint Venture To Construct

#### Second Jones Act RoRo Vessel

Pasha Hawaii Transport Lines (PHTL), the joint venture of The Pasha Group and Van Ommeren Shipping have exercised their option with Halter

Marine for the construction of a second U.S.-built Jones Act Pure Car and Truck Carrier. A second vessel, which will be a sistership to the 13,000-dwt vessel, which is currently under construction at Halter Marine in Pascagoula, Miss., will enhance the service offering of PHTL by providing increased frequency.

The 579-ft. (176.4 m) inaugural vessel has a capacity for 4,300 vehicles, 10 decks and a 100-ton stern ramp. Combined with its sister vessel, the two ships will provide weekly service between Hawaii and two California ports.

### Primar Signs ENGC Agreement With Institute Hidrografico

Primar, the regional electronic navigational chart (ENC) coordinating center has concluded a cooperation agreement with Spain's Institute Hidrografico de La Marina. The agreement, which was signed on November 16 by Captain Juan M. Nodar Criado, the Institute's director, brings the amount of hydrographic offices offering their ENCs through Primar to 11. In addition to extending Primar's growing coverage, the agreement also means that the center now has com-

mitments in place that will result in ENC availability from Finland to the Mediterranean, up to and including the coast of France.

### American Superconductor Choses Alstom For Project

American Superconductor announced the selection of Alstom Power Conversion of Philadelphia as its subcontractor in a program to design an ultracompact high-temperature superconducting (HTS) ship propulsion. The project involves a U.S. Navy Office of Naval Research (ONR) contract for the design and development of high temperature superconducting (HTS) motors for electric ship propulsion. Alstom will be responsible for the design of the stator and drive systems as well as for propulsion system integration motor for the U.S. Navy.

### Casino Princesa Selects Vessel - Net. Corn's MAP Solution

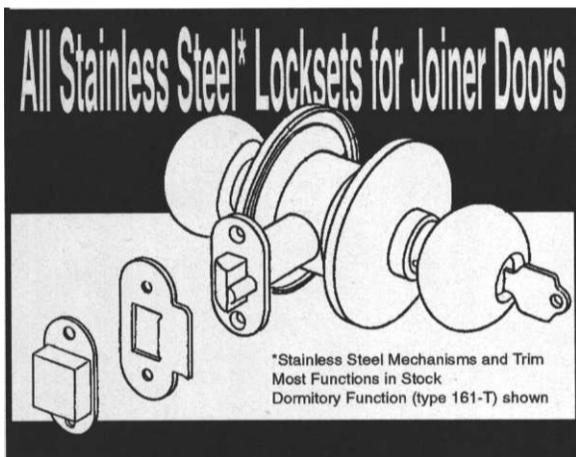
Vessel-Net.com began implementation of its Marine Administration and Planning, (MAP), Solution for Casino Princesa. MAP will provide Casino Princesa with a business and technology framework to improve the operational efficiency of its marine business. The complete MAP solution suite, which includes nine modules: Marine Logs, Maintenance, Interfacing, Inventory, Procurement, Human Resources, Scheduling, Health & Safety and Replication will be implemented for the 200 ft. (60.9 m) luxury mega-yacht that offers day cruises off the coast of Miami. Additionally, Vessel-Net.Com will provide consulting, training and implementation services.

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### Furuno Wins NMEA Awards

Furuno won seven awards at the 2000 National Marine Electronics Association's (NMEA) Convention in Ft. Myers, Fla. Furuno's new FCV1200 Dual Frequency Fish Finder was selected this year's Best Of The Show. This product features a 10.4-in. color TFT LCD and comes with an easy to set 1,2 or 3kW (RMS) transmitter. Additionally, this unit has a Furuno Free Synthesizer (FFS) transceiver, which allows easy selection of a broad range of operating frequencies from 15 to 200 kHz. Holding the title for the Radar-Commercial category was Furuno's FR2105 series of radars. This unit represents advanced microprocessor engineering and collision avoidance features. The FR2105 radar provides a 21-in. multi-color CRT display with plenty of space for on-screen alphanumeric data.

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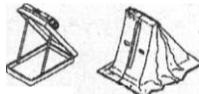


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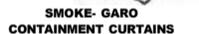
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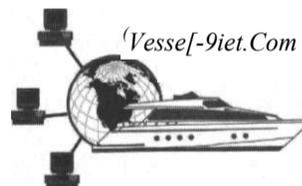
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# Northrop Grumman To Acquire Litton Industries For \$5.1B

In a move which effectively creates a defense and marine naval construction giant, Northrop Grumman Corp. and Litton Industries jointly announced late last month that they have signed a definitive agreement under which Northrop Grumman will acquire for cash all of the outstanding shares of Litton for \$80 per common share and \$35 per Series B Preferred share. The transaction is valued at approximately \$5.1 billion, which includes the assumption of Litton's \$1.3 billion in net debt.

Litton is a leading supplier of advanced electronics and information systems to the U.S. government and international customers and is the premier designer and builder of non-nuclear surface combatant ships for U.S. and foreign navies. The company reported sales of \$5.6 billion and net income of \$218 million for the 2000 fiscal year ended July 31. Litton had \$8.2 billion in fully funded backlog at the end of its first quarter, October 31, 2000.

**Kent Kresa**, Northrop Grumman's chairman, president and chief executive officer said, "We are very pleased with our strategic acquisition of Litton, which we believe brings tremendous value to the shareholders, employees and customers of both companies. With projected combined pro forma revenues of more than \$15 billion in 2001, growing to \$18 billion by 2003, this acquisition solidly places Northrop Grumman among the world's top-tier defense companies and strengthens our commitment to systems integration, defense electronics and information technology."

Mr. Kresa added that, "Litton gives us a new core

**Litton — with a fully funded \$8.2 billion in backlog — is the premier designer and builder of non-nuclear surface combatant ships for U.S. and foreign navies. Pictured is Roosevelt, the premiere Ingalls-built Flight IIA destroyer, a variant of the Burke Class with full up helo facilities.**



## Corporate Bio: Kent Kresa

Kent Kresa was elected president of Northrop Grumman in 1987, CEO in January 1990 and chairman in September 1990. Kresa joined Northrop Grumman in 1975 as vice president and manager of the company's Research and Technology Center, developing new proprietary processes and products for the company. From 1976-82 he served as corporate vice president and general manager of the Ventura Division, a leader in the production of unmanned aeronautical vehicles. In 1982, he was appointed group vice president of the company's Aircraft Group and in 1986 was named senior vice president-Technology Development and Planning. Before joining Northrop Grumman, Mr. Kresa served with the Defense Advanced Research Projects Agency, where he was responsible for broad, applied research and development programs in the tactical and strategic defense arena. From 1961-68 he was associated with the Lincoln Laboratory at the Massachusetts Institute of Technology (M.I.T.), where he worked on ballistic missile defense research and reentry technology. In 1996, Mr. Kresa was named the California Industrialist of the Year by the California Museum of Science and Industry and the California Museum Foundation, and received the Bob Hope Distinguished Citizen Award from the National Security Industrial Association. In 1995, he received the Navy League of New York's Admiral John J. Bergen Leadership Award and was named 1994 Executive of the Year by the Los Angeles Business Journal. The Air Force Association presented him with its John R. Alison Award for Industrial Leadership in 1994. He also received the U.C.L.A. School of Engineering Citation Award in 1990.

competency as a major prime contractor and systems integrator of surface ships for the U.S. Navy. Following the close, Northrop Grumman will be one of the country's largest federal IT suppliers and our defense electronics business will heighten our status as a premier systems and sensor integration leader by expanding into navigation and guidance systems for airborne platforms and other military avionics systems. The acquisition also significantly broadens our portfolio of businesses."

Grumman's and Litton's boards of directors have unanimously approved the transaction.

Following the close of the transaction, it is Northrop Grumman's intention to raise additional capital through a stock offering.

During and after the initial transition period, Litton will be operated as a wholly owned subsidiary of Northrop Grumman. Dr. **Ronald D. Sugar**, currently Litton's president and COO, will become a Northrop Grumman corporate vice president, and president and CEO of the new Litton subsidiary.

"I am pleased that we were able to work with Northrop Grumman to create this combination, which brings together two premier advanced technology companies and generates a broad range of opportunities going forward," said **Michael R. Brown**, Litton's chairman and CEO. "The combination creates outstanding value for Litton and Northrop Grumman shareholders, customers and employees."

The transaction, which is expected to close within the first quarter of 2001, is subject to review under the Hart-Scott-Rodino Act as well as other governmental

and regulatory agencies. The transaction will be structured as a cash tender offer that will be initiated on January 5, 2001, for all the outstanding stock of Litton.

Northrop Grumman, based in Los Angeles, is a high technology company providing innovative solutions in systems integration, defense electronics and information technology for its U.S. and international military, government and commercial customers, as a prime contractor, principal subcontractor, team member or preferred supplier. The company expects to report sales of approximately \$7.6 billion for 2000 and has more than 39,000 employees in three major sectors at sites in 43 states and various international locations.

Litton designs, builds and overhauls surface ships for government and commercial customers worldwide and is a leading provider of defense electronics and information technology services and support to the U.S. government and international customers. The company also provides specialized IT services to both commercial and government customers at the local, national and international level. Headquartered in Woodland Hills, Calif., Litton has more than 40,000 employees in four major business units at facilities in 29 states and other locations worldwide.

Salomon Smith Barney acted as principal financial advisor to Northrop Grumman in this transaction. Goldman Sachs & Co. also provided transaction advice and a fairness opinion. To complete the transaction, Northrop Grumman has received financing commitments totaling \$6 billion from Credit Suisse First Boston and The Chase Manhattan Bank. Litton was advised by Merrill Lynch & Co.

## Rice Receives ISO

### 9001 Certification

It has been more than 100 years since company founder **Maximino Rice** manufactured the first propeller, and nearly 40 years since Rice installed its first propeller for use in the U.S. Since that time, the U.S. has played a key role in Rice Propeller's success, as the company has provided approximately 20,000 propellers in this market.

Standing as a testament to its more than four decades of quality manufacturing and customer service, Rice Propellers has recently obtained the ISO 9001 certification through Bureau Veritas. It is worthy to note, as the company did, that Rice's very first customer is to this day still installing Rice propellers and nozzles.

Circle 49 on Reader Service Card

## Lloyd Triestino Launches LT Unica, Second Of Series

LT Unica, the second of three post-Panamax container vessels ordered by Lloyd Triestino (LT) from Mitsubishi Heavy Industries' Kobe shipyard, was launched on November 22.

The naming ceremony was carried out by Evergreen group chairman Dr. Chang Yung-fa and Pier Luigi Maneschi, president of Lloyd Triestino

Measuring 935 ft. (285 m), The Italian-flagged LT Unica has a beam of 131 ft. (40 m) and a draft of 42 ft. (12.7 m), moving at a speed of 25 knots.

Subsequent to LT Unica's delivery, LT sent off LT Usodimare on November 29. The first vessel in the series is scheduled to set sail immediately for Shanghai to join LT's weekly China - Europe - Mediterranean (CEM) service, which employs eight post-Panamax vessels on a fast 56-day round-trip schedule. Apart from the new U-types, LT's fleet comprises 12 vessels: two of 3,428 teu, eight of between 2,728 and 2,987 teu, and two of 1,555 teu.

Circle 31 on Reader Service Card

## Finnlines Consolidates, Announces Appointments

Finnlines' subsidiaries, Finn carriers Oy Ab, a company specialized at sea transportation and FG-Shipping Oy Ab, a company specialized at ship management and technology, were recently merged to the parent company Finnlines Pic. In addition, port operation companies of Finnlines, Finnsteve Oy Ab, which is operating the ports of Helsinki and Oy A.E.Erickson Ab, which is operating the port of Turku, were also merged into one company called Finnsteve Oy Ab.

Finnlines' German subsidiary Posei-

don Schifffahrt AG has changed the company name to Finnlines Deutschland AG. The new company structure is in force since January 1, 2001.

Shipping and Sea Transport Division includes Finnlines Cargo Services and Finnlink Services. **Asser Ahleskog** is in charge of Finnlines Cargo Services. His responsibilities cover the marketing,

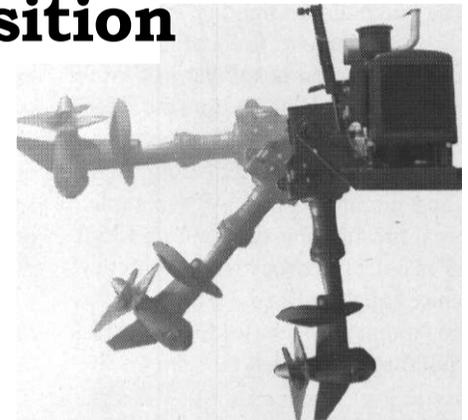
customer service and fleet operations of Finnlines Cargo Services as well as the ship management of the Group. Other personnel moves include: **Christer Antson** is in charge for Corporate financial control, accounting as well as Corporate administration; **Seija Turunen** is in charge of Corporate finance, public relations, and investor relations; **Lars**

**Trygg** is in charge of Corporate legal matters and insurance; **Kari Savolainen** is in charge of Corporate IT, research and development; **Christer Backman** is in charge of Finnlink Services and the Managing Director of Oy Finnlink Ab; and **Hans Martin** is the Managing Director of the new Finnsteve Oy Ab.

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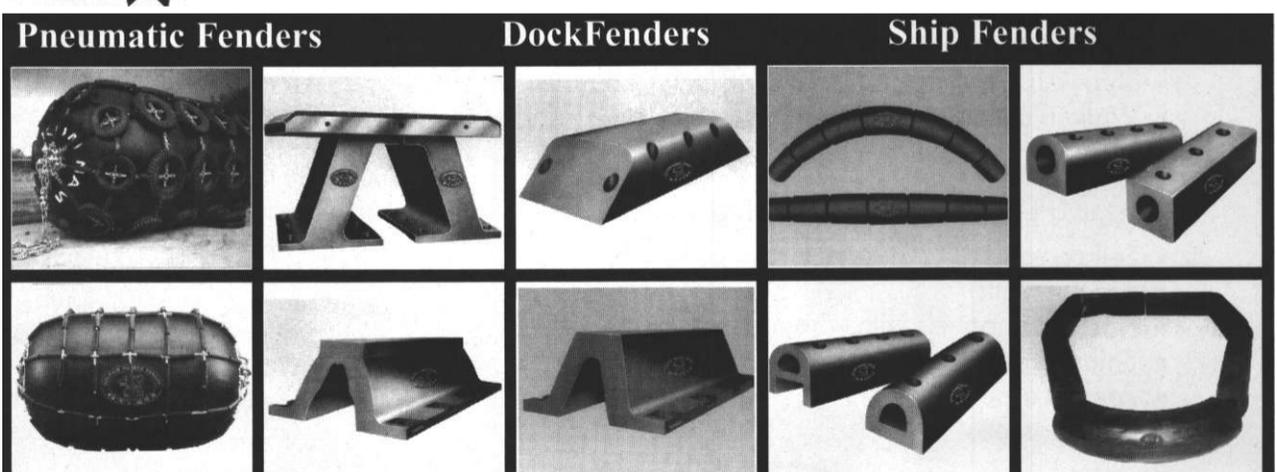
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**Svenska Skum Equipment On New Fireboats**

Svenska Skum, a subsidiary of Unitor ASA, won contracts for the design and supply of external fire-fighting systems to a series of newbuilding fireboats under construction in Hong Kong and Greece.

The Hong Kong contract involves the general design and system responsibility for the external fire-fighting system for the world's largest fireboat currently under construction at the yard of Wang Tak (Yard No. Y2001) for the Hong Kong Fire Department. The order includes the design, engineering, delivery and commissioning of a complete external fire-fighting system for a 136 ft. (41.5 m) steel fireboat with a pumping capacity equaling Fi-Fi 2 class

The complex system for the Wang Tak newbuilding comprises three main fire-

fighting pumps with step-up gearboxes, clutches and flexible couplings. The specification also includes two large foam pumps with soft starters, eight fire monitors of various sizes up to 2,400 cu. m./hr. capacity, 10 swivel deck heads, six foam proportioners, 30 remote operated valves and 10 monitored valves.

In Greece, two 126 ft. (38.5m) steel high-speed fireboats under construction at the Greek shipyard Nayse SA (Yard Nos 108-109) for the Piraeus Fire Department will also feature complete external Svenska Skum fire-fighting systems. The order from specialist engineering and project management company Tsokres & Tsokres Enterprises Ltd., of Piraeus will see Svenska Skum provide detailed system design, complete system engineering, equipment procurement, commissioning and documentation for both 20 knot vessels. Each Greek fireboat will be equipped with

two skid-mounted, diesel-driven fire pumps, foam and water monitors mounted on a telescopic mast and Snorkel boom, remote control system for valves and pumps, foam pumps and proportioners, as well as a self-protection water spray nozzle system.

Circle 50 on Reader Service Card

**Rjeka Shipbuilders Readies To Construct Chem Carrier**

The shipbuilding contract initially signed by 3.Maj Brodogradiliste and Calisa this past August in Italy has come to fruition as the Croatian-based shipyard has accepted payment of the first contract price installment.

Throughout the next two years, (the vessel is scheduled for a 2002 delivery), construction financing will be covered by the buyer with financing for the remainder to be controlled by arrangers on the international capital markets. The Buyer's prepayments have been secured by a Croatian Bank for Reconstruction and Development (HBOR), Zagreb.

The scheduled contract increases 3 Maj's orderbook to a total of seven vessels — offering myriad of employment at the yard through 2003.

Main Particulars	
Classification	RINA
Length, (o.a.)	577 ft. (176 m)
Length, (b.p.)	554 ft. (169 m)
Breadth	98 ft. (29.8 m)
Depth to main deck	55 ft. (16.8 m)
Scantling draft	36 ft. (11 m)
DWT	35,000
	15.2 knots
Main propulsion engine	... 3 Maj Wartsila NSD
MCR	.. 9,000 kW @ 130 rpm
Cargo tank capacity	43,150 cu. m

compact hull form, higher safety and strength warranted by a complete double-hull structure, flat deck configuration for good bridge visibility and exceptional maneuverability due to a small windage area.

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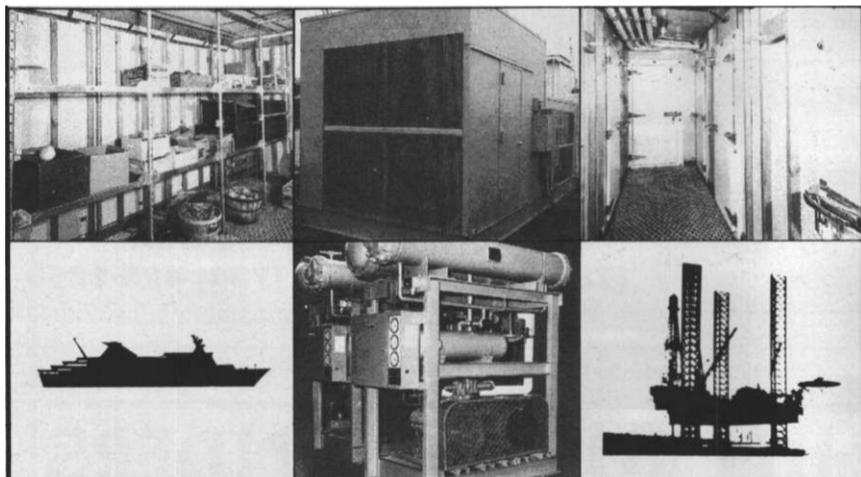
**Boskalis Expands Fleet With Suction Hopper Dredger**

On October 14, Waterway, a new 4,900 cu. m trailing suction hopper dredger for Westminster Dredging Co. of U.K. was inaugurated and launched at the Merwede Shipyard in Hardinxveld-Giessedam. The barge differs from others in its class because its shallow draft and large loading capacity has been especially designed to carry out on- and foreshore beach replenishment, dredging and maintenance work in shallow water. This customarily involves silt, sand, gravel and soft clay. The Waterway is unique not only because of its low draft, but its dredge pump speed as well. It is adjustable through a special two-stage gearbox, which provides for precise control of the mixture of speed and power. The company will deploy the barge mainly for dredging operations on short and medium-range distances by the end of this year.

Circle 51 on Reader Service Card

Main Particulars	
Length	320 ft. (97.7 m)
Breadth	75 ft. (23 m)
Draft	23 ft. (7 m)
Dredging draft	(6.5 m)
Load capacity	6,700 tons
Hopper capacity	4,900 cu. m
Speed	13 knots

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**NKK Delivers Fourth Membrane Tank Carrier**

NKK Corp. has delivered a 22,500 cu. m LNG carrier to Mitsui OSK Lines and Nusantara Shipping. Named Surya Satsuma, the vessel is the fourth LNG carrier with a GTT Mark III type membrane cargo containment system. It was built at NKK's Tsu Works and will be chartered by Pertamina — Indonesia's state-run petroleum company — to carry Indonesian LNG to Japan for Hiroshima Gas Co. The GTT Mark III membrane tank system is advantageous because of its

Main Particulars	
Length, (o.a.)	495 ft. (151 m)
Length, (b.p.)	471 ft. (143.5 m)
Breadth, (molded)	92 ft. (28 m)
Draft	23 ft. (7 m)
DWT	12,498
GT	20,017 tons
Main engines	Mitsubishi
Output	7,796 kW x 133 rpm
Service speed	16.5 knots

**USNS Impeccable Christened At Halter Marine**

The newest Military Sealift Command (MSC) ship to grace the waters was christened on November 1 at Halter Marine in Pascagoula, Miss. The ceremony included the official naming of the vessel — the only one in its class. Measuring 281 ft. (85.6 m), Impeccable can run at a speed of 12 knots, and is designed specifically for deploying two towed-array sonar systems — passive and active. The former listens for acoustic information, while the latter works in sync with the passive system to gather acoustic data. The vessel was co-sponsored by Leah Gansler, wife of the Honorable Jacques S. Gansler, Secretary of Defense for Acquisition and Technology; and Margareta Augustine, wife of Norman Augustine, former chair and CEO of Lockheed Martin.

Circle 52 on Reader Service Card

## Eastern Shipbuilding Delivers Newest OSV

Eastern Shipbuilding delivered OSV San Rafael to Naviera Tamaulipas of Tampico, Mexico for operations in the Bay of Campeche oil fields off Eastern Mexico. Measuring 204 x 44 ft. (62.1 x 13.4 m) with a 16 ft. (4.8 m) beam, the ABS-classed supply vessel houses the most recent propulsion innovations and control systems. Its plant is comprised of a pair of Caterpillar 3516B main



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3800 Series



MARCO-built Millennium Star on sea trials; most dressed for christening (above)



Mid-Range 2250 Series	Mid-Range 3800 Series	Long-Range 3900/7700 Series
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Power 4kW	6kW/10kW	10kW/25kW
Scanner 24" Radome/48" Open	48"/72" Open	48"/72"/108" Open
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Specialized equipment includes a 1,000 hp Thrustmaster retractable tunnel/azimuthing bowthruster powered by

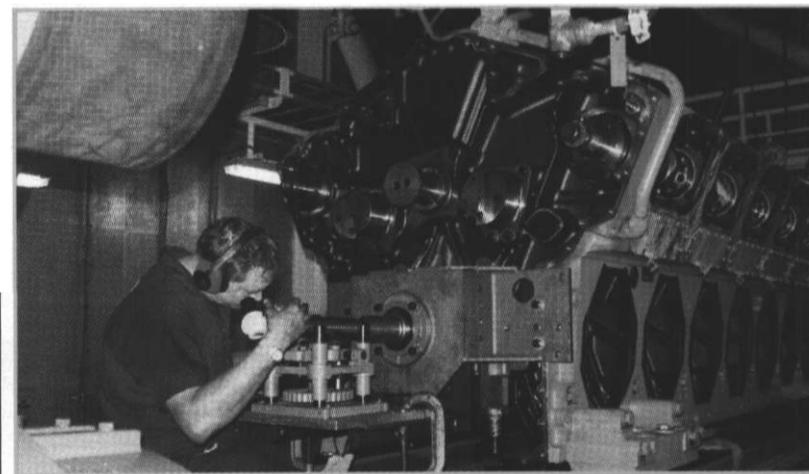
a Caterpillar 3508B engine, high lift style independent rudders and Kongsberg Simrad Dynamic Positioning System with Joystick Autopilot.

Karl Senner of New Orleans provided the Reintjes gears for the vessel, and Thompson Tractor was the provider of all the main and auxiliary engines.

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## New & Notable

### Ayton Cross Arrives To Boost Wijsmuller Marine's Fleet

Wijsmuller Marine has accepted at its Teeside berth of Ayton Cross, the first of two-azimuthing stern drive (ASD) tractor tugs from the Spanish shipbuilder Astilleros Zamacona. Following a crew familiarization period, Ayton Cross is expected to be in full service by the middle of November.

The second tug, Ormesby Cross, is due to be delivered by Zamacona before the end of year. Both tugs will be based on the River Tees from where the Wijsmuller tug fleet covers both the Tees and the port of Hartlepool.

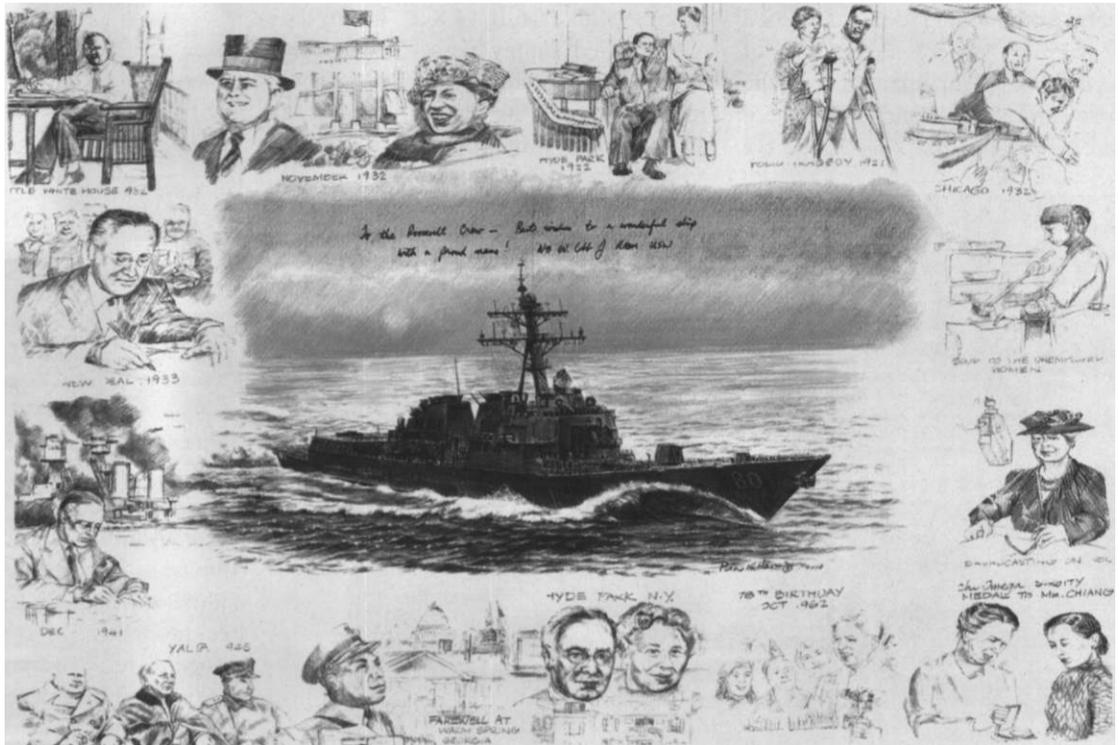
With a bollard pull of 60 tons each, the two new tugs will be the most powerful units in the Voith/ASD Tees fleet and will allow Wijsmuller to transfer one of its existing Tees tractor tugs, Yarm Cross, to its Tyne operation.

Until now, the largest tugs on the Tees have been Fiery Cross and Phoenix Cross, both of 3,890bhp and 41 tons bollard pull. They have been supported by the 3,400bhp/37 tons bollard pull Cleveland cross and Roseberry Cross and the 2,640bhp/35 tons bollard pull Yarm Cross and Coatham Cross.

The transfer of the Yarm Cross to the Tyne is seen as a further upgrading of the Tyne fleet by introducing a twin azimuthing tractor tug. Wijsmuller maintains three tugs on the Tyne, which serve the ports of Tyne, Sunderland and Blyth.

Circle 55 on Reader Service Card

## USS Roosevelt Is Commissioned At Mayport

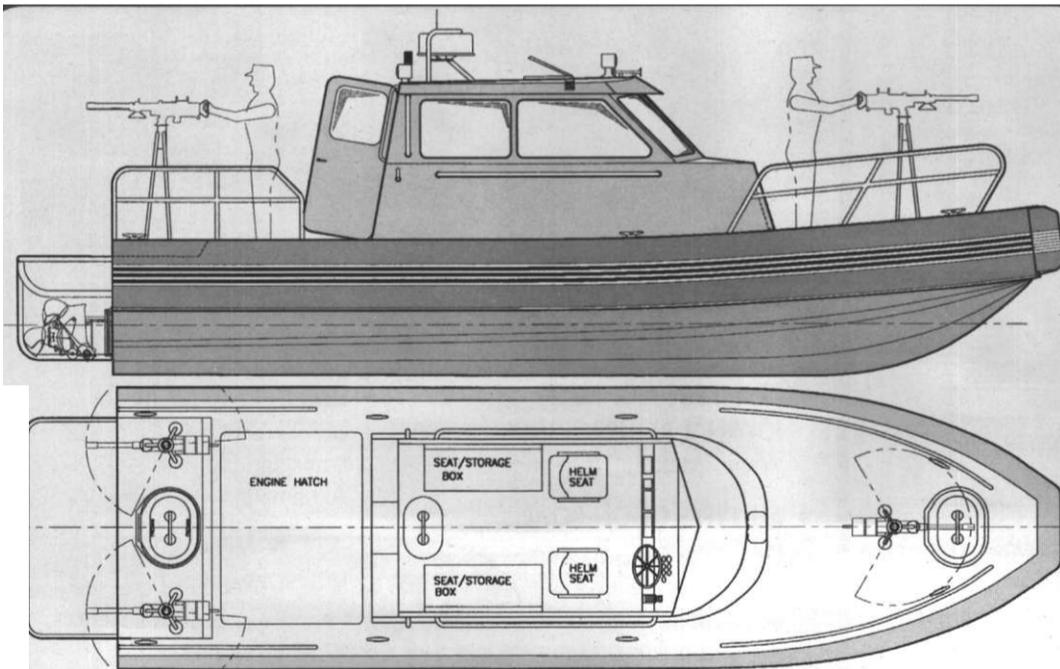


The nation's 30th Arleigh Burke class Destroyer, USS Roosevelt, was commissioned on October 14 at Mayport Naval Station Florida. Roosevelt is the premiere Ingalls-built Flight IIA destroyer, a variant of the



Christening ceremony of USS Roosevelt.

## WILLARD 32' KINGSTON CLASS PATROL RIB



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The vessel's namesake honors America's 32nd President, **Franklin D. Roosevelt** and First Lady **Eleanor Roosevelt**. Serving as the ship's sponsor was **Nancy Roosevelt Ireland**, while the Honorable **Tillie Fowler**, Congresswoman of the 4th District of Florida gave the Principal speech. Platform participants included RADM Wayne E. Meyer, USN; Fred Parker, DDG 51 class Shipbuilding Program manager; and **Jerry St. Pe** of Litton Industries.

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Maritime Reporter & Engineering News

## Kvichak Marine Continues Cat Excellence

Kvichak Marine Industries has furthered its presence in the catamaran and patrol boat markets by combining the two to construct patrol catamarans. The company's newest delivery is an add-on to its 54-ft. (16.4 m)

**Main Particulars — California Fish & Game catamaran**  
 Length, (on deck) 55 ft. (16.7 m)  
 Beam 20 ft. (6 m)  
 Engines Cat 3196 DITA  
 Gears Twin Disc  
 Top speed 30 knots  
 Design Teknikraft

**Main Particulars — Alaska Fish & Wildlife Protection**  
 Length, (on deck) 64 ft. (19.5 m)  
 Beam 25 ft. (7.6 m)  
 Engines Twin Cat 3196  
 Marine gears Twin Disc  
 Top speed 30 knots  
 Hydraulic marine crane Morgan  
 Steel davit Kolstrand

patrol catamaran that was built for California Fish and Game (CAF&G). Named Thresher, the vessel will be joined by a sistership, Marlin, this coming spring.

The state of Alaska also wants to get in on this new innovation — specifically Alaska Fish & Wildlife Protection (AF&WP) — that has ordered a new cat for fisheries patrol. Based in Kodiak, the vessel is scheduled for a summertime deliv-

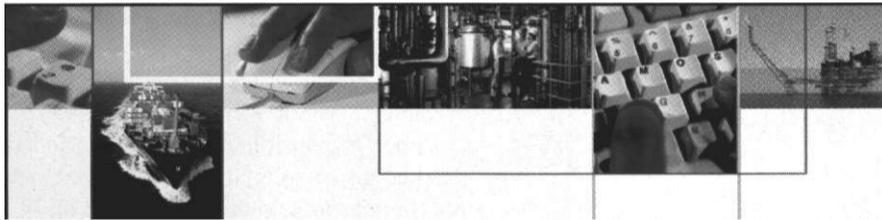
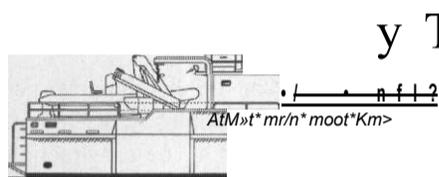
ery. This new generation of catamarans is conducive because of their increased stability and usable deck space for patrol operations. Each will also house a variety of deck equipment along with boarding launches.

## Flender Werft RoRo Ahead Of Schedule

Flender Werft delivered the RoRo vessel Slingeberg on October 27 to its owner Wagenborg Scheepvaart — one month earlier than scheduled. The vessel is the last of a RoRo trio, which Finnish-Swedish forestry product group StoraEnso operates between Gothenburg and Zeebrugge, transporting heavy paper and cardboard supplies within the StoraEnso Cargo Units (SECU). Measuring 45 x 12 x 12 ft. (13.8 x 3.6 x 3.6 m), these specially fabricated tall containers exceed that of conventional 40-ft. containers. The company plans to use approximately 900 units of these containers, which can hold up to 70 tons of paper, for combined rail/sea transportation of products. Sailing under the Dutch flag, the vessel is built according to Bureau Veritas regulations, and is designed for transportation of up to 105 SECUs, trailers, trucks, containers, cars and general cargo. The main deck and lower hold will be loaded via a stern ramp as well as a fixed ramp within the ship, which will lead to a lower

hold. Slingeberg's propulsion is produced through a long-stroke, crosshead diesel engine by Wartsila NSD, with an output of 10,920 kW at 135 rpm. The engine operates through a 125 m long shaftline onto a CP propeller, producing 18 knots. Electrical power supply is provided by two auxiliary diesel generators as well as one shaft generator with a total capacity of 3,360 kW.

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## AMOS Computer



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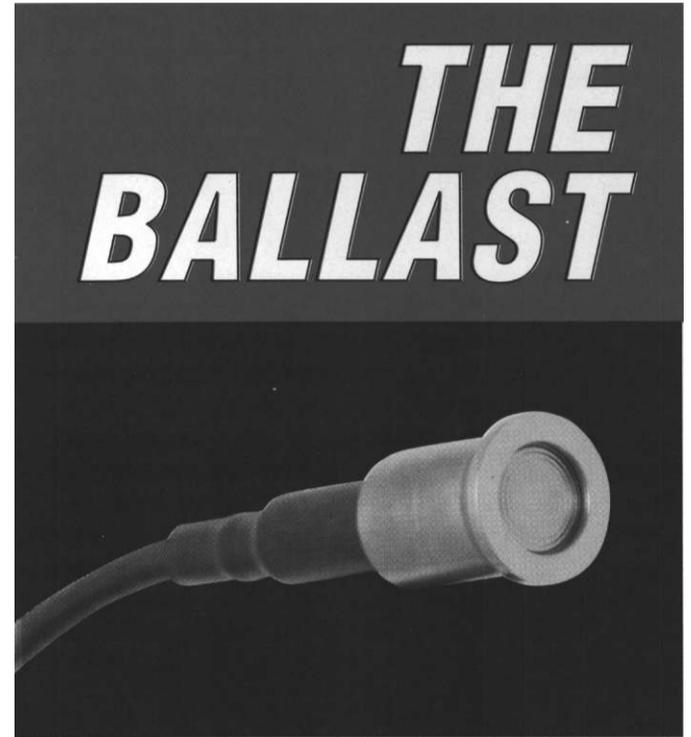
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# Blount-Barker Shipbuilding Formed

Blount-Barker Shipbuilding Corporation was recently formed and **James A. Barker** has been named the President and CEO. Blount-Barker, based in Warren, R.I., specializes in the design and shipbuilding of tugboats, cruise ships, high-speed ferries and dinner and passenger vessels. The new company takes over the

activities of the Blount Marine and Blount Industries entities, and operates as a separate corporation. As part of the new venture, Mr. Barker assumes management of Blount's shipyard and personnel, with the option to purchase the operations should they be sold in the future.

"Jim Barker brings complementary experience that will greatly enhance the capabilities of the new Blount-Barker venture," said **Luther H. Blount**, founder of Blount Marine and Blount Industries. Blount, 84, will remain active in the day-to-day shipyard operation for Blount-Barker. "Through this new venture, we intend to maximize the superior naval architecture design and shipbuilding capabilities of Blount Marine and Blount Industries," said Jim Barker. "We also plan to expand into larger commercial vessels in the coming years," he added.

Blount Marine was founded in 1949 by Luther Blount, and today extends over six acres in Warren with a staff of more than 50. Blount Marine has been an innovator in the shipbuilding industry for more than half a century. Luther Blount holds 21 U.S. patents for numerous inventions, including the stern trawler and the net/drum technology.

Before forming Blount-Barker Shipbuilding, Barker worked for Interlake Steamship Company, Richfield, Ohio. His most recent project was as the construction supervisor for a 7,200-hp Z-drive tug and a 600-ft. self-unloading barge for the Great Lakes. Barker joined Interlake in 1987 as a supervisor of unlicensed personnel, managing all of the company's unlicensed crewing for vessels. Barker was soon promoted to director of personnel, responsible for 350 people and 10 vessels.

Barker also explored and organized new business opportunities to help diversify Interlake. In 1996, after earning his MBA from Case Western, Barker was promoted to assistant vice president and was responsible for all aspects of a \$25 million tug/barge project. This endeavor provided many new opportunities for Interlake. Barker received his undergraduate degree from Franklin Pierce College in Newton, N.H.

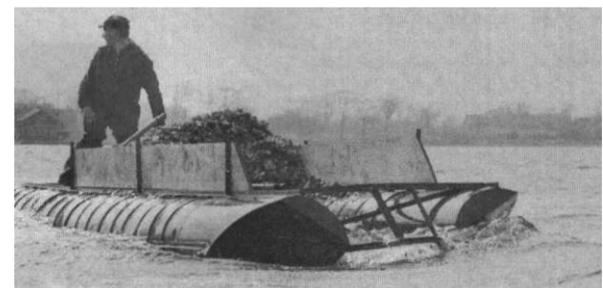
#### Blount: 1949 to Present

In 1949, Luther H. Blount decided to try his hand at shipbuilding by designing and constructing a 77-ft. steel catamaran. Using this same design, he bid and won his first contract to construct a fuel oil service vessel which used two cylindrical floats, dubbed the "twin tube."

This twin tube was succeeded by progressively larger and more complex vessels, resulting in a quantum expansion of the shipyard and demolition of the Blount home on the Warren River in Rhode Island. New facilities were constructed in its place including a slipway, two building sheds and a lift dock configured for launching and drydocking. Over the past 50 years, Blount has designed and built more than 300 vessels of all types. The company also provides operational sup-



Miss Liberty, built by Blount for Circle Line, has carried more than 60 million passengers.



Luther Blount aboard his first-ever vessel, Rhodoyster Jr.

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Circle 205 on Reader Service Card

## FSL Secures Major Block Booking From Hoverspeed

Portsmouth-based Fleet Support Limited (FSL) has reached a milestone in the fast ferry refit market with a block booking for up to five Hoverspeed craft throughout the next few months.

The premiere vessel, Diamant, has already arrived and is set to be followed by the Rapide, which was scheduled for a December delivery. Hoverspeed Great Britain, Hoverspeed Denmark and the monohull Super Seacat One will arrive this month; docking periods will encompass up to three weeks.

All the ferries will undergo a variety of work with FSL prime contracting the program and carrying out the majority of the work, with engineering support from Dover-based Burgess Engineering. The overall package includes aluminum welding, hull surveys, mechanical engineering, structural work and maintenance of the water jets.

Circle 4 on Reader Service Card

## RINA Feasibility Study Improves High Speed Comfort

Italian classification society RINA has concluded that the comfort of passengers on High Speed Craft can be upgraded by onboard seaworthiness management systems. According to a technical and economic feasibility study jointly performed by RINA and Italian shipyard Rodriquez Cantieri Navali on an integrated system for real time monitoring of comfort and structural behavior of high-speed craft has shown that the system offers positive benefits.

The feasibility study, which was recently completed, is part of the 5.5 million Monitus R&D project, which commenced on January 1, 2000 and is expected to last 36 months. The Monitus project will jointly be carried out between Rodriquez Cantieri Navali; Rodriquez Engineering; Registro Italiano Navale; Marin and Ishdtu, is to develop and test field an integrated system for monitoring the structure and seaworthiness

of high-speed craft. The onboard system will be able to detect the severity of loads as well as motions and will provide suggestions to the ship's master on how to best optimize the vessel's handling in all sea conditions.

The system is a spin-off of Rodriquez's innovative SMS — Seaworthiness Management System — which is fitted to most of the company's fast vessels.

Circle 7 on Reader Service Card

## Blount-Barker Shipbuilding Formed

port for Bay Queen Cruises, a dinner/excursion line, and the American Canadian Caribbean Line that operates three overnight passenger cruise ships.

In 1952, Luther Blount was approached by Frank Barry and Gerald O'Driscoll to negotiate the design and construction of a 130-ft., 600-passenger vessel. Barry's business, Circle Line, was subsequently awarded the National Park Service's contract to handle tourist excursions to the Statue of Liberty. The Miss Liberty remains in operation today, and has carried more than 60 million passengers from Manhattan to the Statue of Liberty. This vessel is believed to have carried more total passengers than any other in the world. Blount Industries went on to design and construct a total of seven vessels for the Circle Line Statue of Liberty Ferry.

In 1955, Blount Industries used U.S. Coast Guard (USCG) T-boat regulations and designed "Blount 65" vessels which are just under 65-ft. long. Typically they carry some 250 passengers and can reach 10 knots on about 10 gallons of fuel per hour. This design gained immediate success and various ferry, commuter and excursion operators throughout the world still use these vessels today.

In 1962, Blount designed and built the Narragansett, the world's first small stern trawler. Although Blount garnered three patents from this invention, the design was widely copied by fisherman without charge. This net/drum technology remains popular worldwide, with virtually every small trawler using this rig design.

### Cruise, Ferries, Dinner Vessels

In 1964, Blount expanded the capacity of the shipyard to build the M/V Uncatena, a 150-ft., triple screw passenger/vehicle ferry for the Woods Hole/Martha's Vineyard/Nantucket route. This popular mini-cruise boat design was eventually extended to 200-ft., and later applied to Blount's American Canadian Cruise Line. Today this line consists of three larger cruise ships with varied itineraries including the Maine coast, Newfound-

land and Labrador, intra-coastal waterway to Florida, eastern and western Caribbean, and the northern coast of South America.

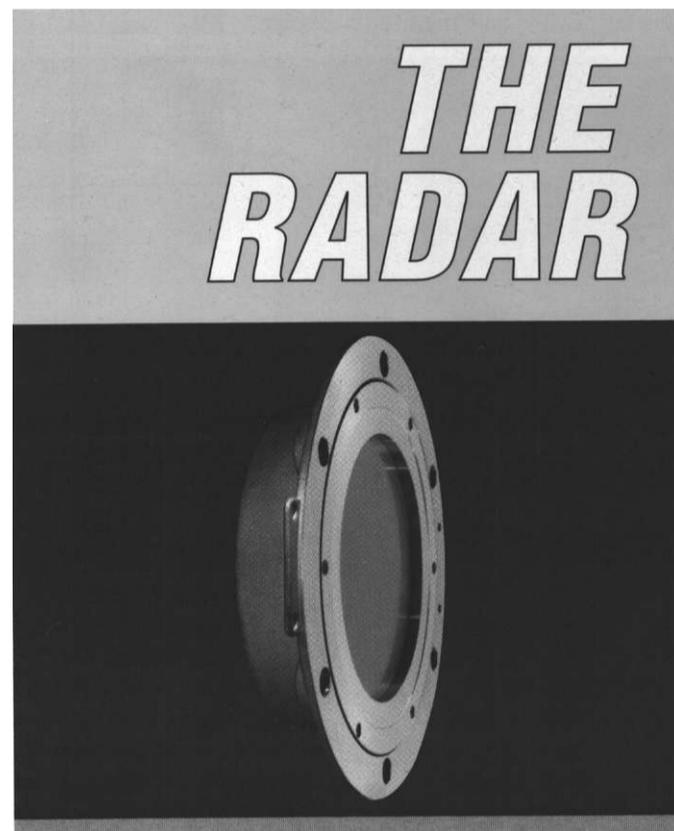
Blount expanded its cruise ship fleet in 1998, with a new line of 183-ft., 100-passenger Grande Class small cruise ships. During the 1980s, Blount's "Spirit Class" three-deck dinner boats began cruising U.S. harbors such as Baltimore, Norfolk, Philadelphia, Boston, New York, Chicago and Los Angeles. These stylized vessels are still in use today, giving 400 to 600 lunch or dinner passengers views of harbors and Broadway-style entertainment. In March 2000, the 600-passenger M/V Horizon was completed, marking the 20th dinner boat built by Blount and the sixth Blount-constructed dinner boat to operate in New York.

### Innovations

Luther H. Blount currently holds 21 U.S. patents. Technical and production staff has greatly contributed to the success of Blount's business over the years. The company has employed various naval architects including Preston Gladding, Fendall Marbury, Warren Sherburne, Bob Henry, Al Bates, Chris Melo, Darren Preston and William Jordan. By effectively combining its resources, Blount has developed various marine construction techniques and designs. Highlights include:

- Three-dimensional lofting, a technique now widely used throughout the industry, eliminates the need for mold loft and allows the builder to follow the designer's exact requirements.
- High horsepower stern drive propulsion with whalefin skeg helps increase available payload space. With Blount's stern drive, the engine is turned around and placed well aft over the propeller shafting. The shaft is driven by toothed belts.
- 400-ton lift dock, designed and patented, accommodates hulls up to 150-foot long. This air controlled, electric-powered lift dock operates with a single lever and is powered by just one 50-horsepower motor.

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**Destiny Yachts Joins Delta T Systems Alliance**

Destiny Yachts, Fort Lauderdale, Fla., is the latest yacht builder to join Delta "T" Systems' strategic corporate alliance program. As a new member of this group, Destiny will now benefit with quicker, easier and more cost-efficient



access to Delta T's engine room ventilation products.

Delta "T" Systems' products manage airflow through the engine room to improve engine performance and service life.

They include fans, fire dampers, moisture eliminators and automated electronic ventilation controls. The agreement

calls for Destiny to incorporate Delta T Systems as standard equipment on all their vessels, which range from 88 ft. to 135 ft (26.8 to 41.1 m).

**Circle 6 on Reader Service Card**

**Derecktor Shipyards Installs**

**Delta T's Products**

Derecktor Shipyards installed Delta T's engine room ventilation products on its 135 ft. (41 m), high-speed catamaran ferry for the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority in Massachusetts.

The Delta T products present on the ferry — named Flying Cloud — consist of marine axial fans, moisture eliminators and stainless steel fire/smoke dampers.

**New N.C. Ferry-Linked Water**

**Monitoring Generates Data**

For the first time in its history, marine scientists at the University of North Carolina at Chapel Hill (UNC-CH) and Duke University have begun monitoring surface water quality in the Neuse River with the assistance of the Neuse River and its North Carolina Department of Transportation staff.

The effort, which will be called Ferry-Mon, is expected to become a model for ferry-based water quality monitoring throughout the U.S. Co-directed by Drs. **Hans Paerl** and **Joseph S. Ramus**, professors at the UNC-CH and Duke marine laboratories in Morehead City and Beaufort, respectively and project co-directors, will expand their monitoring to the Swan Quarter-Ocracoke and Cedar Island-Ocracoke ferries next spring.

The goals of this program consist of learning how excessive naturally produced nutrients and those resulting from agriculture, industry, municipalities and domestic sources affect the environment and providing information needed for long-term water quality management.

In order to properly implement the system, Ramus and Paerl consulted with colleagues in Finland, where a comparable monitoring system already is operating. The Finns coerced the two, who commenced work on the N.C. version three years before last year's disastrous effects of Hurricane Floyd, which prompted the state's financial support.

The FerryMon equipment, which is reportedly one of the most sophisticated in the world, was constructed at EndecoYSI of Marion, Mass. According to Paerl, one of the product's major advantages is its cost savings, which results from its placement aboard the ferries.

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## Largest Aquastrada High Speed Ferry Under Construction At Rodriquez

Currently under construction at Rodriquez Cantieri Navali SpA's Pietra Ligure shipyard is a TMV 115 high-speed passenger and vehicle ferry for the Spanish ferry operator Balearia Eurolines Maritimes. The contract for this vessel was signed in January 2000 and delivery is expected in May 2001.

Though very similar in size and capacity to the previous TMV 114 delivered to Spanish operator Armas Ocean Jet in April of this year, there are notable differences.

The reasons for these differences between the two vessels are due to owner preferences, including the choice of hull material. The additional truck lane meters of the TMV 115 have been obtained by using hoistable central and outboard car decks to allow for these taller vehicles. The car decks may be quickly hoisted upwards in a variety of configurations depending on loading requirements.

The maximum passenger and vehicle capacity of the TMV 115 is 210 cars and 884 passengers. Other details are outlined in the attached technical specification data sheet.

As with the majority of Rodriquez's Aquastrada Fast Ferries, TMV 115 will again incorporate a ride control system manufactured by Rodriquez Marine Systems, a wholly owned subsidiary of Rodriquez Cantieri Navali SpA. Based on almost five decades manufacturing foil systems, Rodriquez Marine Systems has a vast experience in the design and engineering of foil-based stabilization system.

Therefore, the TMV 115 includes T-Foils both fore and aft as well as four lateral fins for roll control. In addition, active Interceptor tabs are mounted on the transom with the added benefit of reducing roll and creating a hydrodynamic wedge thereby reducing resistance and increasing vessel speed. The entire system is centrally controlled by a single system that is optimized to provide the maximum passenger comfort under the most demanding sea conditions. A further benefit of the Rodriquez Marine System SMS (Seaworthy Management System) ride control system is the incorporation of small rudders into the T-Foil's vertical struts to provide directional control at full speed thereby maintaining maximum forward thrust from the waterjets. In addition to the ride control system for the TMV 115, Rodriquez Marine Systems is also supplying: Central vessel alarm and monitoring system; Start / stop / alarm / monitoring system for the propulsion equipment; Bow

thrusters (tunnel and retractable type) and Hydraulic systems for all car decks and ramps.

Rodriquez is presently constructing 30 82 ft. (25-m) patrol boats for the Italian Coast Guard and a 213 ft. (65-m) yacht for a U.S.-based owner.

Circle 2 on Reader Service Card

Main Particulars - TMV 115	
Classification	RINA
Flag	Spanish
Home port	Palma de Majorca, Spain
Length, (o.a.)	378 ft. (115.2 m)
Length, (waterline)	316 ft. (96.2 m)
Beam	56 ft. (17 m)
Draft	16 ft. (5 m)
GT	5,889
DWT	700 tons
Main engines	4 x Caterpillar
Diesel generators	4 x Caterpillar
Gearboxes	Reintjes
Propulsion	Lips waterjets
Max. speed	42 knots
Range	650 n.m.

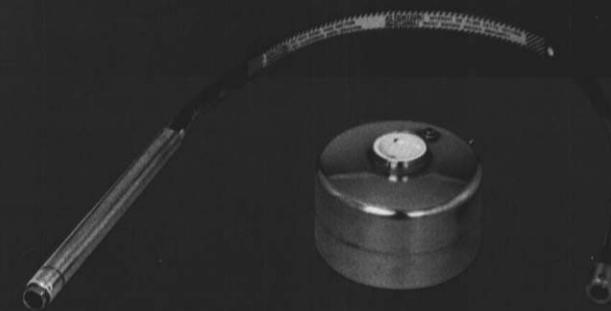
### Rodriquez Cantieri Delivers Aquastrada TMV 114

Rodriquez Cantieri Navali delivered another Aquastrada TMV 114, Volcan de Tauro, to its owner Armas Ocean of Messina, Italy.

The 374 ft. (114 m) vessel, which was delivered this past spring, successfully met or exceeded all owner specified contractual obligations, which were confirmed during sea trials. The vessel demonstrated a maximum speed of 45 knots and a service speed of 40 knots was maintained at 90 percent MCR and a full load. Both speeds were achieved via Rodriquez's Seaworthiness Management System (SMS) Stabilization System. Comprised of four lateral fins and two T-Foils, the system is designed entirely by Rodriquez. Upon departure from the shipyard, the vessel steamed to the Canary Islands to commence service between Las Palmas and Tenerife.

Main Particulars - Volcan De Tauro	
Classification	Bureau Veritas
Flag	Spanish
Home port	Las Palmas
Length, (o.a.)	374 ft. (114 m)
Beam	54 ft. (16.5 m)
Draft	8 ft. (2.5 m)
GRT	5,889
Main engines	6 x Caterpillar
Auxiliary engines	4 x Caterpillar
Propulsion	Lips waterjets
Max. speed	45 knots
Passengers	880

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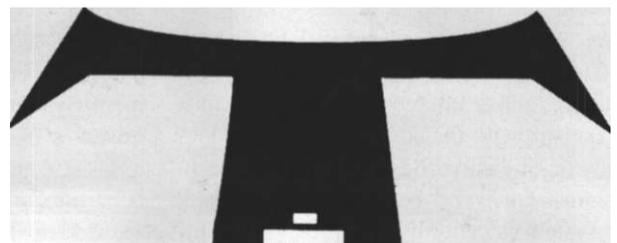
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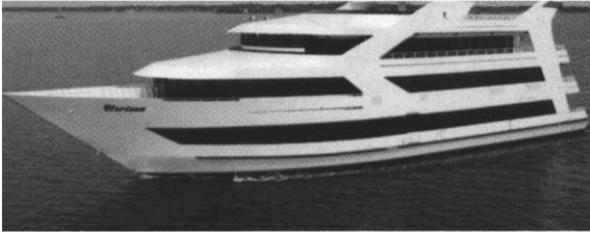
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## Passenger Vessel

**wf&sm** **mlmSt**

**Name** M/V Horizon  
**Vessel type** Dinner cruise vessel  
**Builder** Blount Industries  
**Owner** Pegasus Yacht Cruises



The 600-passenger dinner cruise vessel, M/V Horizon was delivered to Pegasus Yacht Cruises of New York by Blount Industries on March 5.

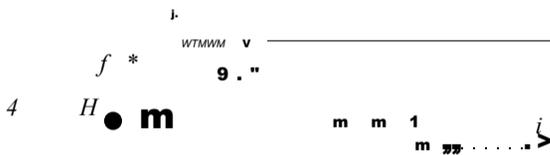
Measuring 161 ft. (49 m), Horizon boasts a welded steel, single chine hull with three enclosed dining decks, with all superstructure above the second deck is 100 percent aluminum construction. New Jersey-based Robinson Interiors designed Horizon with old world ambience in mind — its dining room features varnished cherry wood paneling and trim.

The vessel is powered by two owner-supplied Detroit Diesel 16V-92 engines, soft mounted for silent operation with Lo-Rez vibration mounts and couplings. Electric engine controls by Mathers provide throttle and gear control, while a Murphy alarm panel monitors the propulsion engines. Twin 200 kW Detroit Diesel 6V-92 generators supply electrical power for the vessel's services via a split bus switchboard. A dedicated Detroit Diesel 4-71 engine provides power for a 125-hp, 22-in. diameter hydraulic bow thruster, while steering is achieved by an Autonav Electro-hydraulic steering package with duplicate hydraulic pumpsets.

Two Rheem 18 kW water heaters provide 240 gallons of hot water to all the heads, bars, galley and other onboard services. An 80-ton Dunham-Bush Chiller, with a 60 kW boiler, provides the vessel's HVAC system.

Circle 56 on Reader Service Card

**Vessel Name** Flying Cloud  
**Type** High-speed catamaran ferry  
**Builder** Derecktor Shipyards  
**Owner** The Woods Hole & Martha's Vineyard Steamship Authority



Delivered a week ahead of contract schedule, of Flying Cloud, a new Derecktor 134 ft. (40.8 m) high-speed catamaran ferry built by Derecktor Shipyards in Mamaroneck, N.Y. The Woods Hole, Martha's Vineyard & Nantucket Steamship Authority provides year-round passenger and vehicle ferry service to the islands

of Martha's Vineyard and Nantucket. Service is provided from Woods Hole to Vineyard Haven, and Hyannis to Nantucket. Seasonal service is also provided from Woods Hole to Oak Bluffs on Martha's Vineyard.

Flying Cloud's speed during sea trials was in excess of 39 knots. The boat showed great stability and ride comfort thanks to its dynamic ride control system. Noise levels are contained on both passenger decks and on the bridge. The Steamship Authority plans to employ this vessel on the Hyannis Port to Nantucket route. Its service speed of 36 knots will allow a crossing time of less than one hour, significantly less than the traditional design ferries, which take over two hours to cover the same distance.

The vessel is powered by Paxman 12VP185 diesel engines driving Kamewa 71SII water-jets that provide a service speed of 36 knots with a full load of 300 passengers. Passenger accommodation is with aircraft quality seats on two decks with 171 passengers seated in a 3-3-3-3 arrangement on the main deck and 129 seated in a 4-4 configuration with a central lounge area on the upper deck. Exterior seating is also provided on the upper deck to allow passengers the option of open-air travel. The boat has a large bar on the main deck, is ADA friendly and has a four-season HVAC system capable of removing moisture from the air and eliminating window fogging. The pilothouse has 360-degree vision and is equipped with the latest and most up-to-date navigational equipment, including a night vision system that allows seeing ahead of the boat in total darkness.

A particularly critical issue for the Woods Hole Steam Ship Authority is the wake wash generated by the vessel when operating in the wash sensitive areas at either end of the route. The extremely low wash characteristics of the vessel assure a particularly low environmental impact.

Circle 21 on Reader Service Card

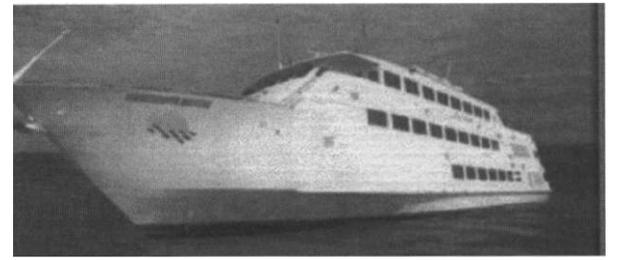
**Vessel Name** Horizon's Edge  
**Type** Dinner/casino  
**Builder** Washburn & Doughty Associates  
**Owner** Casino Cruises

Washburn & Doughty Associates recently delivered its largest vessel to date - the 186 x 38 x 11 ft. (56.6 x 11.5 x 3.3 m) dinner/casino boat Horizon's Edge. Bruce D. Washburn of Washburn & Doughty teamed up with John D. Gilbert Associates Inc. to design the vessel, which is already in full and successful operation.

Since ensuring the comfort of the 500 passengers on board was a main concern to both the builders and operators, Horizon's Edge was designed to handle offshore conditions with heavy gaming equipment on board.

The vessel, which has a cruising speed of 15 knots, is powered by two Caterpillar 3508B DIT main engines, each rated 1,100 bhp at 1,800 rpm. An American Bow Thruster "Trac Series" dual propeller 28-in. diameter unit, powered by a 200 hp variable frequency electric motor, enhances maneuverability.

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# International Appeal With Local Customer Service Feel

Atlantic Marine Inc and Atlantic Dry Dock Corp have forged an enviable reputation around the globe in all aspects of vessel construction, conversion and repair. The yards offer ship owners modern physical facilities, technical capabilities and organizational experience, and are conveniently located on 81 acres of property on the St. Johns River and Intracoastal Waterways in Jacksonville, Florida. The yards are well positioned to the U.S. East Coast, South Florida and Caribbean trade routes.

To ensure success continues well beyond the new millennium, Atlantic Marine Inc. and Atlantic Dry Dock Corp. are committed to a program of investing considerable resources to add to and upgrade its already impressive facilities. Capital investments are primarily focused on reducing the cost of production while maintaining quality and reducing construction time, and increasing capacity for both new building and repair. For example, a 14,600 LT (14,833.60 MT) floating dry dock was recently added to Atlantic Dry Dock Corp's arsenal. While shipyard upgrades are sizable, investment does not stop there. The company counts its employees - craft workers through top management - as the foundation upon which the company is built. To this end, the company takes great measures to ensure it recruits and retains top talent, and outfits them with the best technology available. "You can attribute our quality work, in large part, to our conscientious workforce," said Kevin E. Wilson, sales and marketing manager for Atlantic Marine Inc. and Atlantic Dry Dock in Jacksonville. Atlantic Marine Inc. originated in Jacksonville in 1964, specializing in new construction. Atlantic Dry Dock Corp. was the result of Atlantic Marine's fast growth, and is a ship repair company which has developed a reputation for high quality and on-time, on-budget repair and conversion jobs in the commercial market, and an expert in complex military vessel overhauls.

"Our strength is, of course, our quality of



**Aerial View of Atlantic Marine Inc. / Atlantic Dry Dock Corp.**

work, but equally our ability to schedule and finish work on time or ahead of schedule." said Mr. Wilson. "The key is to get that vessel back to work making money for our customers."

#### New Construction

Atlantic Marine, Inc., a subsidiary of the Atlantic Marine Holding Company, builds custom vessels for the domestic and international markets. Previous deliveries include oil support vessels, ferry boats, tugs, dinner vessels, casino boats, and oceanographic vessels.

Atlantic Marine Inc. has found itself popular among buyers of high technology, high quality tonnage. "We will give you a quality ship, and you will get it on time. When we make a commitment, we keep it." Said Edward P. Doherty, president, Atlantic Marine Inc. The yard recently launched two 300 ft. coastal cruise boats built for Delta Queen Coastal Voyages. The first of the

two, CAPE MAY LIGHT is scheduled for delivery in March 2001, while the second, CAPE COD LIGHT is scheduled for delivery in June 2001. Mr. Doherty attributes the yard's success with unique vessels to its adherence to modular construction techniques, and its investment in technology, particularly in the areas of steel cutting and handling, as well as CAD systems, as a means to this end. In January 2001 construction started on a SWATH oceanographic research vessel that upon its completion will be operated by the University of Hawaii.

#### Repair & Conversion

Atlantic Dry Dock Corp. saw the back to back commercial ship dry-docking availabilities on their 14,600 LT (14,833.60 MT) floating dry dock for the cable layer, WAVE VENTURE; container ship, AURORA; Dredge, COLUMBIA; jack-up barge, KARLISSA B; and bulk carrier, GYPSUM

KING. Their 1,300 Ton (1,321 MT) marine railway schedule has been busy dry-docking the tugs ZEETIJER, SAMAND, APOLLO, CECROPS, gaming vessel, STARDANCER; dinner cruise boat, RIVER QUEEN; and research vessel, SES-200; to name a few.

Atlantic Dry Dock's 4,000 Ton (4,064 MT) marine railway underwent an extensive maintenance refit and is now fully operational again. Atlantic Dry Dock had an increased number of topside availabilities that were accomplished along-side Atlantic's 1,300 ft. (396.24 M) of full-service bulkhead and pier space. Among those jobs were the converted OSV to Ferry, SEABULK MINNESOTA; the RoRo, CROWLEY SENATOR; Dredge, SUGAR ISLAND; Tug, SEA TERN; Barge, HUGH; and Dredge, GL-54.

This past year, Atlantic Dry Dock Corp., added the following agents to their sales force:

- M.I.E. Services Ltd. - Cyprus
- Marindustry Worldwide - Northeast Region, U.S.A.
- James L. Taylor & Associates - Gulf Region, U.S.A.
- Hellenic Industrial & Marine Agencies Ltd. - Greece

They are actively searching for representation in the following countries / regions:

- Turkey
- Bahamas
- South America
- West Coast, U.S.A.

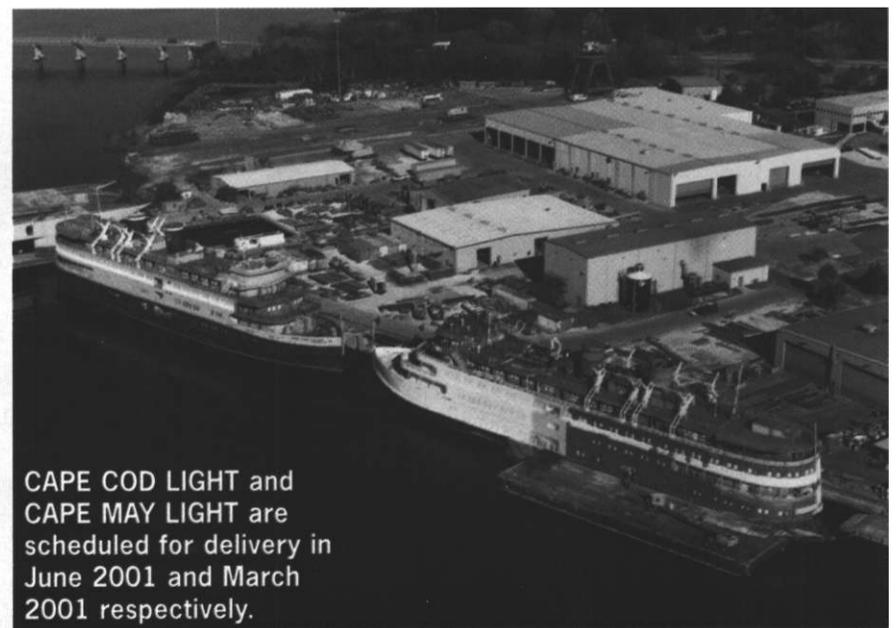
#### Certified Quality

With intense price pressures and competition, shipyards must prove their quality to compete. Atlantic Marine Inc is certified to ISO 9002 quality standards for shipbuilding and ship construction services by Lloyd's Register Quality Assurance and by the following national certification bodies: ABS (U.S.); TGA (Germany); and INMETRO (Brazil). Atlantic Dry Dock Corp. was ISO 9002 certified in 1995.

**Circle 198 on Reader Service Card**

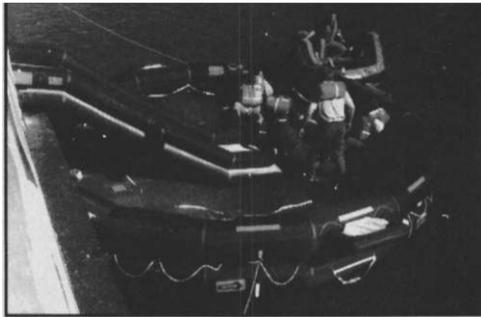


Atlantic Dry Dock Corp. is a strong competitor in the high-profile megayacht repair market.



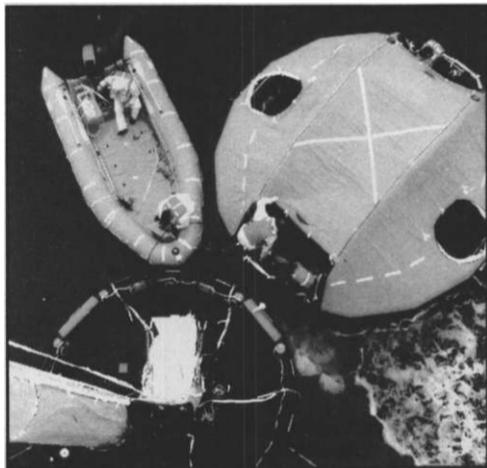
CAPE COD LIGHT and CAPE MAY LIGHT are scheduled for delivery in June 2001 and March 2001 respectively.

## IKE SHUT EVACUATION SYSTEMS THAT HE IS COAST GUARD



### Evacuation Slide System.

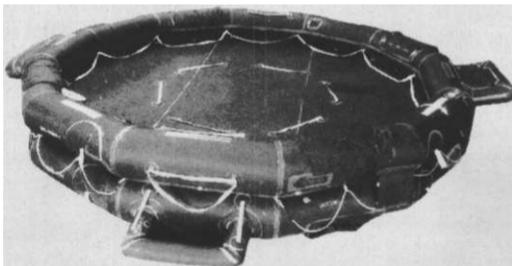
Designed specifically for Low Freeboard Vessels, it is a combination slide and platform. It provides speedy evacuation for all passengers - young, old and physically challenged. US Coast Guard Approved.



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**Vessel name** Nina's Dandy  
**Type** Dinner Cruise  
**Builder** Freeport Shipbuilding  
**Owner** Dandy /Cruises

A unique dinner cruise vessel, Nina's Dandy, was built for Dandy Cruises for service on the Potomac River in the Washington, D.C. area. The vessel was designed by DeJong & Lebet Naval Architects, and was built by Freeport Shipbuilding, Freeport, Fla.

The 135 x 40-ft. (41.1 x 12.1m) vessel's low profile allows her to access the upper parts of the river, past several low bridges. Nina's Dandy has an air draft of only 16 ft. (4.8 m). It is USCG Certified under Subchapter K for 300 passengers and crew, and measures less than 100 gt.

The vessel's pilothouse is stepped above the main deck, and features a small private room below it, half in the hull, and half above the deck. The second deck is an open observation deck to view the many sights on the DC waterfront. The main deck features large windows to enjoy the views from the comfort of the fully air-conditioned dining room.

Nina's Dandy is powered by a pair of Cummins NTA-855 diesel engines, 350 hp @ 1,800 rpm, with Twin Disc MG-5111 gears, driving a pair of Rice five-bladed propellers. Electrical power is provided by a pair of Cummins 6BTA generators @ 95 kW. A 16 in. American Bow Thruster, 80 hp, is electrically powered off a third genset. Controls and motors for the bowthruster were furnished by SCR Engineering.

The vessel carries 35 tons of air-conditioning by Marine Air, as well as 6,000 gallons of water, 5,000 gallons of fuel, and 5,000 gallons of sewage.

Nina's Dandy is the fifth dinner cruise vessel designed by DeJong & Lebet delivered in the past year. The firm currently has two other dinner vessels under construction, and two on the drawing boards.

Circle 24 on Reader Service Card

**Vessel Name** Maui Magic  
**Type** All-aluminum catamaran  
**Builder** Kvichak Marine Industries  
**Owner** Maui Classic Charters Inc.

Kvichak Marine Industries has constructed and delivered Maui Magic, a 54-ft. (16.4 m) all-aluminum catamaran, to Maui Classic Charters (MCC) of Kihei, Hawaii for operation out of Maalaea Harbor in Maui. After donating the Lavengro, a 1926 schooner, to The Northwest Schooner Society of Seattle, MCC decided to build a new vessel in order to maintain their fleet

size. The company chose a catamaran design from Morrelli & Melvin, of San Diego, Calif, and Kvichak Marine as their builder. Maui Magic has a beam of 17



ft. (5.1 m), and is USCG approved for 71 passengers plus a crew of four. Powered by twin Cummins 6CTA diesel engines, driving 28-in. stainless steel propellers through ZF IRM 305A marine gears, Maui Magic will cruise at about 20 knots with a top speed of about 22 knots.

Maui Magic will travel to Molokini Crater and the rugged Maui coastline for snorkeling and sightseeing tours.

Additional Maui Magic features include: an upper deck with a passenger capacity of 18; swim platform; boarding ramp; 400 gallon fuel capacity; and two marine heads. Maui Magic is the second Morrelli &

Melvin catamaran Kvichak has delivered to Hawaii. Their first delivery was the 54 x 14 ft. (16.4 x 4.2 m) Ocean Explorer for Pacific Whale Foundation, also of Kihei. Kvichak is currently constructing a third 54 x 14 ft. (16.4 x 4.2 m) catamaran built to a Morrelli & Melvin design for Atlantis Submarines. The vessel was to be delivered in December 2000.

Circle 25 on Reader Service Card

<b>Vessel Name</b>	<b>C-Angel</b>
<b>Type</b>	<b>Motor yacht</b>
<b>Builder</b>	<b>Intermarine</b>
<b>Owner</b>	<b>Private</b>

C-Angel, the first 95-ft. (28.9 m) raised pilothouse motor yacht built at Intermarine Savannah's full-service shipyard, was launched during ceremonies in August and was delivered to its owner, an experienced yachtsman, in November. Intermarine and Michael Peters Design provided the naval architecture of the yacht, and Pavlik Design Team is credited with the interior design and decoration.

The C-Angel's lower deck features a three-cabin layout, accommodating six persons, as well as quarters for the captain and two crewmembers. The owner's cabin and head span the vessel's entire 21-ft. (6.4 m) beam. The main deck features a formal dining room amidship, a salon aft and a fully equipped kitchen forward. Twin MTU/DDEC 12V2000 engines deliver a cruising speed of 20 knots and a top speed of 22 knots. Other standard equipment includes a Naiad 302 stabilizer, a Naiad/HPS 38 hp bow thruster and twin fixed pitch propellers. C-Angel is fully classified by American Bureau of Shipping (ABS) requirements for Maltese Cross A1 Yachting Services, AMS.

C-Angel, the fifth fiberglass vessel launched by Intermarine, follows the recently delivered 118-ft. raised pilothouse vessel, Savannah. C-Angel will be followed into the water by the end of this year by a second 118-ft. raised pilothouse and another 95-footer.

Circle 26 on Reader Service Card

#### German Dry Cargo Division Breaks Into Super Yachts

The Bremen, Germany-based company within Hamworthy KSE's Dry Cargo Handling Division has entered into a specialist market honing in on its innovative skills — the fast-growing super yacht market.

The company, which specializes in tailor-made solutions to shipowners cargo handling requirements, as well as the Super Yacht newbuilding market — now has the ability to meet the fast changing requirements of the marine industry. It

has accomplished this by securing two contracts to design, supply and supervise specialized equipment installation onboard two large Super Yachts building at two German shipyards - Kroger Werft and Lurssen Werft for undisclosed owners. The 325 ft. (99 m) vessel that is

being constructed at Kroger Werft is named Pelorus. The contract requires the design and delivery of side shell doors, an internal bulkhead door and stem platform. Equipment was scheduled for the end of 2000 with Kroger Werft due to deliver the vessel in April

2002. Currently nearing completion at the yard's Bremen facility is the 320 ft. (97.2 m) long Faberge, which is equipped with virtually the same equipment supply as Pelorus. The vessel is scheduled for delivery later this year.

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# 3-D Modeling For Small And Large Vessel Construction

Developments in shipbuilding have been driven by needs to simplify the engineering and manufacturing. The cause is not just to become more competitive but also to avoid problems in controlling engineering and manufacturing costs. Two recent examples carried out with ShipConstructor include a small 7.5-m aluminum police boat and a 120-m car/truck/pax mono-hull fast ferry. Both vessels have been 3-D modeled using the same ShipConstructor software, which can be scaled to be a price efficient solution for small and large vessels at the same time. The software maintains the same functionality. The reduced cost version is only limited in the maximum number of parts in the project. The

smallest configuration is limited to 500 structural parts (the police boat had about 300) at a cost of less than \$1,000. The ease of use and rapid modeling enables users to 3-D-model even small boats faster than they can design the same using traditional 2-D drafting, thus enabling small boat builders and large vessel constructors alike to use the very same software tools.

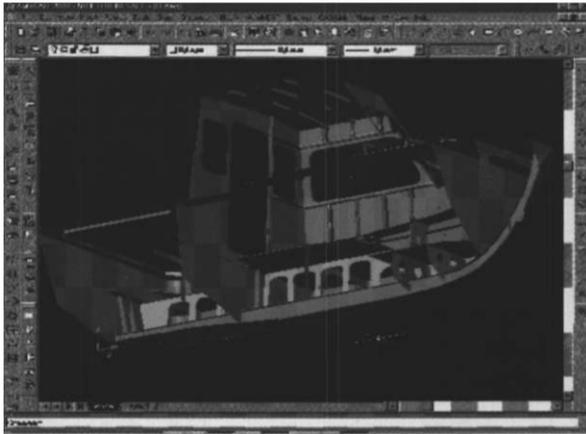
## Small Police Boat

Recently, ARL participated in the set up of a new aluminum fabrication division at Victoria Ship Yards, Victoria, B.C., Canada. The objective was to use design and manufacturing methods resulting in lower skill requirements in comparison to what is required traditionally. This involved the introduction of methods to simplify the engineering design process and the production procedures to ensure that there would be no need for rework. The shipyard also introduced precision parts manufacturing and an assembly process resulting in significant productivity gains and a higher quality product. The shipyard has a small, efficient engineering staff. Before this project the engineering design and drafting was carried out using conventional 2-D AutoCAD drafting. The trade personnel involved in this program were sheet metal journeymen, who have a good hand in working with thin gage stainless steel fabrication and with smaller aluminum assemblies, i.e. tanks, railings etc. However, there was no history of aluminum boat building.

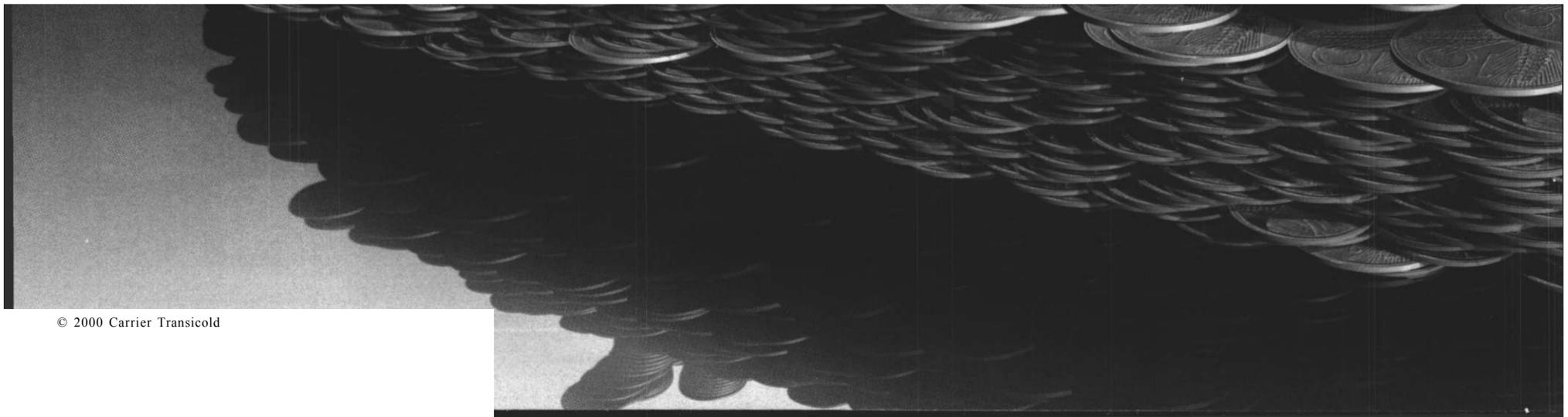
It took less than two man weeks to complete the 3-D structural model, and produce all working drawings for some 300 individual parts using ShipConstructor. The full 3-D structural model of the vessel ensured that there would be no part match up problems. We also knew the exact hull weight and got an accurate estimate of the cutting time. All curved plates had been lofted electronically and expanded to flat patterns, then coded to NC machine code.

The parts manufacturing was done with a CNC high speed milling method, where the dimensional accuracy of the parts is in the range of 0.005 inches. Both, metal and non-metal materials have been cut for this project. None of the parts had any allowance for trimming, even though this particular hull had never been built earlier. All plates were marked to simplify joining parts. ShipConstructor provided exact nesting. All data on the nest plots and in the report is automatically kept up-to-date. Due to the exact fit, the parts can be assembled without the use of jiggling. This special method works by beginning with the bottom shell plates being joined at the keel starting from the aft end. While doing so the plates automatically obtain the correct shape. Installing longitudinal stringers, frames, hull sides, and decks at the marked positions follows this stage.

The entire hull is tacked together, and stitch welding is performed in selected places. The sheet metal crew was familiar with the thermal characteristics of aluminum and with limited guidance was able to assemble



3-D solid model — checking of interferences and fit.



## CAD/CAM

three vessels without having to trim any parts or force fit any components. The weld joints were accurate everywhere producing ideal conditions for welding.

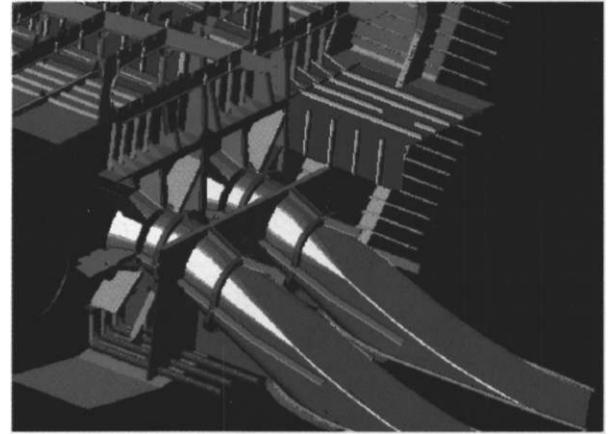
Many manufacturers underestimate the costs of correcting mistakes that occur involuntarily during the design and manufacturing process. These costs exceed the cost of taking preventive measures. ShipConstructor, developed by ARL, permits working in a conventional 2-D drafting mode. However this program produces from the working AutoCAD drawings, automatically a 3-D structural model, calculates weight, CG, and provides material estimates and other documentation from a single database. This virtually eliminates human errors and the elimination of rework is evident by experiencing timesavings in excess of 40 percent over the use of conventional shipbuilding methods.

### 120 m Fast Ferry Project

In April 2000 Intersection Design, France started the Rodriquez Cantieri Navali, generating all production drawings, nests and supporting documentation needed for the building of their latest project, the all aluminum, car/truck/pax mono-hull fast ferry TMV115 (see related story on page 29), using ShipConstructor software. The ship is contracted for delivery in April 2001, leaving about 12 months for the development of the detail design, the preparation of the production documentation, and the actual construction of the ship. The design team was composed of two technical draftsmen with about two years experience in ship production and two fresh technical university graduates, supervised by a project manager. The TMV115 is currently under construction; portions of it being allocat-

ed to four separate shipyards, none geographically close to Rodriquez. Some of the blocks will be transported by barge while others will be towed at sea, for final assembly at Rodriquez. Final design and production work started two weeks apart in early April, yet significant changes were requested by the customer as late as May. The last nest and assembly drawings have been delivered to the yard in late September; about 16 months have been invested by the Intersection Design team to supply the full production documentation. Working in the AutoCAD environment, it was possible for Rodriquez to directly access the Intersection Design network for on-line red-lining of drawings and downloading of final documents. Aluminum work is scheduled for completion by early December 2000, while outfitting has already commenced in September. The 3-D model of the TMV115 consists of well over 15,000 structural parts, 350 nests and hundreds of stiffener plots and 3-D assembly drawings. 3-D drawings were provided to the shipyard for easier assembly work throughout the project. All along, ShipReport kept track of all drawings and scores of parameters, systematically cross-checking to validate data integrity between the AutoCAD drawings and the database.

In great part thanks to the extensive automation and data validation provided by ShipConstructor, no major errors disturbed the extremely tight production schedule. For the record, seven minor errors were easily corrected in the yard. Considering the limited experience of the Intersection Design team, it was the consensus that the ShipConstructor software provided the environment for such an outstanding result. The 3-D-model makes inspection of the structural assemblies



Structure and water jets modeled with ShipConstructor.

easy and effective by all parties, before nesting, cutting and production. Designed to be operated on a network by a team, the ShipConstructor architecture allows work to take place concurrently on a single area, and the real-time cross-referencing by each operator of the work being carried out by the others. Hence, up-to-date drawings are being used at all times by all users. Both projects utilized the structural and production modules of ShipConstructor. More substantial savings in engineering and production as well as higher quality products can be expected when companies utilize the fully integrated piping module that will become available in March 2001.

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The preceding was authored by **Rolf G. Oetter**, President of ARL, and **Rolf Bjornert**, M Sc Engineering, Albacore Research Ltd.

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# Autostructure - For Ease In The Creation Of Internal Structures

In June 2000, Autoship Systems Corporation of Vancouver, Canada launched Autostructure, its new internal structural design program.

Autostructure is used to create a 3-D model of a vessel structure and to output the parts of that model in CAD format. The CAD representation can be used to either prepare construction drawings or for input to NC cutting processors. Autostructure utilizes an Autoship-generated hull and/or superstructure and can also include the shell plate information created in Autoplate. (Autoship and Autoplate are programs from Autoship Systems.)

Every aspect of Autostructure was designed to allow parts to be created quickly and with minimal input. While there is a general workflow, no set ways or sequences are forced upon the user, thus enabling maximum productivity with minimum effort. And since parts can be generated rapidly, mistakes can be quickly and easily remedied. Also, if a part is changed or moved, Autostructure can update the surrounding structure for you, saving you time and effort.

The tools that Autostructure provides are:

- A part database with a powerful categorization system
- The ability to rapidly cut parts to the shell and/or each other
- Sophisticated 2-D part editing
- Comprehensive CAD output
- Extensive reporting capabilities
- A user-expandable Material library

Autostructure is built on top of SQL7 - Microsoft's most powerful database system. As delivered, Autostructure can support up to five users either in a client-server or peer-to-peer network. For more than five users, a full SQL7 system should be purchased separately. Autostructure allows the user to set up a

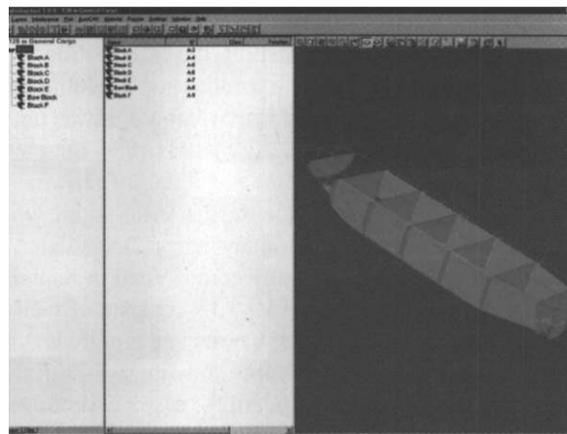


Figure 2: The Autostructure Main Screen with OpenGL viewer and a Browser for navigating the part hierarchy.

hierarchical system to organize the model. Three examples are: i) by actual structure i.e. ring/block/module/subassembly; or ii) by designer: each designer could be assigned his/her own, separate assembly, which could be further subdivided, and would be able access the other designer's work; or iii) by material: for a repair job, the user might want to group individual parts by material type, i.e. material/size/profile/grade. Also, for each project, Autostructure provides the user with the ability to set up a Permissions scheme that controls which operations each designer is permitted to perform.

Autostructure provides several different methods for creating parts. Autostructure also includes special tools that speed up the part-making process, such as the ability to rapidly copy the details (stiffeners, cutouts, openings and markings) from one part to another or to quickly subdivide a large part into the separate plates from which it would be constructed. Additionally, each time a part is trimmed at the hull or another part, a weld path is automatically created along the trimmed edge. The weld paths can be used

to generate weld relief cutouts on other parts and can be included in weight and scheduling reports.

Autostructure uses AutoCAD 2000 for all 2-D editing functions. Special tools allow the user to easily attach and edit stiffeners, swiftly generate openings, stiffener cutouts and markings and also to perform boolean operations. Of course, all the usual AutoCAD functionality is available as well.

All CAD output is automatically placed into AutoCAD as an AutoCAD drawing. Three different formats are available: i) a 2-D array of selected part outlines with cutouts and markings, i.e. the typical information which would be sent to an NC-cutting processor and/or nesting program; ii) a 2-D presentation of parts, such as a cross section which would be used to prepare construction drawings; and iii) 3-D output to use for 3-D drawings to show the relationship of parts, or crucial construction details. Extensive control is provided for output, such as layer creation, size and 'thickness' of cross-section and type of stiffener marking.

Autostructure can generate many different reports, such as Weights and Centers, Bill Of Materials and Weld reports. The output is sent to Crystal Reports, which allows the presentation to be completely customized with minimum effort. Optionally, hull plate information created in Autoplate can be added to the Autostructure model and then included in reports, i.e. a center of gravity report for a sub-assembly can include the weight and centre of the shell plates, thus allowing the user to prepare a proper lifting arrangement for the structure.

Autostructure maintains a library of materials that includes material type, plate thickness, extrusions (stiffener profiles), flat bars and finishes (for rendering purposes). As each part the user creates is assigned properties from the library, consistency of material for all parts is guaranteed.

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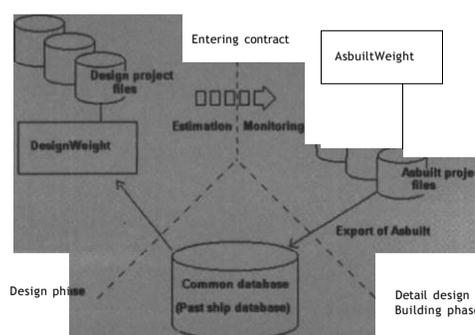
# Proteus Adds Weight Estimating to FlagShip Suite

Proteus Engineering has added the ShipWeight program to its FlagShip suite of ship design and manufacturing software, adding further depth to the already broad range of engineering disciplines covered by FlagShip. In addition to its use as a standalone tool, ShipWeight is being interfaced to both the MAESTRO structural finite element analysis module of FlagShip, and the new Smart Product Model that is currently under development at Proteus Engineering. ShipWeight, developed in Norway by BAS Engineering with input from a number of Norwegian shipyards and design firms, provides both tracking and monitoring of weight and center of gravity (CG) of the ship as-built, and detailed estimating of weight and CG for new designs. As contractual penalties for weight grow ever larger, and more responsibility for weight is given to designers, it is

becoming more important than ever to be able to confidently create a weight estimate very quickly, early in the design process. With penalties in the range of \$7,000/ton exceeding 3 percent of contract weight, software such as this can be inexpensive "insurance."

Currently in use in five shipyards and 12 design firms in Europe and the U.S., ShipWeight gives the user the ability to track weights and run scheduled weight reports in order to find any deviations as early as possible. Weight items can be tagged according to different schemes, to be able to create

reports organized by construction phase, building module, owner-requested change, etc. ShipWeight can use SWBS, MarAd, or the ShipWeight breakdown structure, or the user can define his or her own. ShipWeight also provides weight distribution data that can be exported to GHS, NAPA, and other programs, as well as overall radius of gyration data for use in sea-

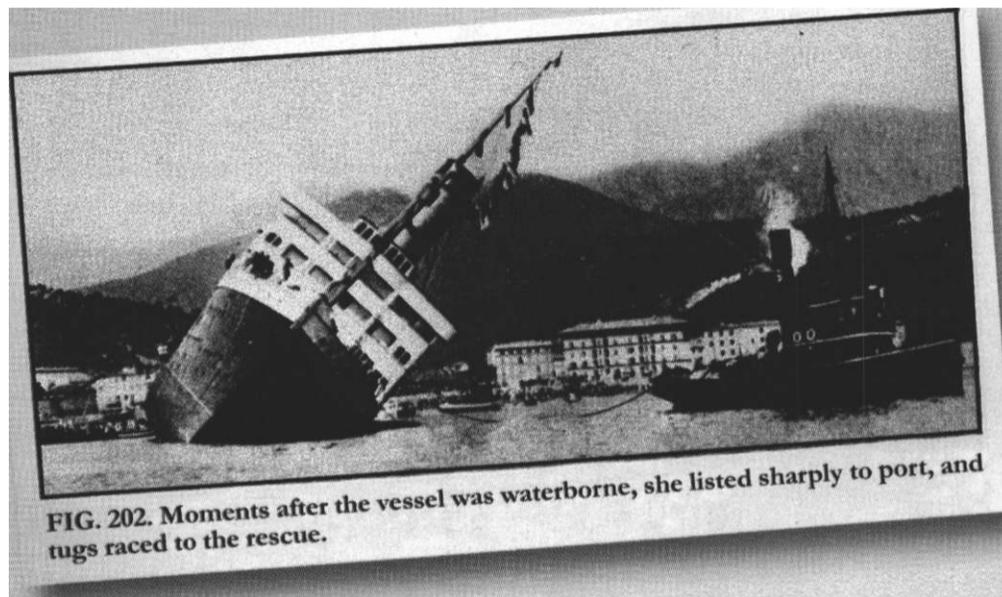


The database structure

keeping analyses. After an "as-built" weight model is complete, it is included in the central database, making the data available for use in new design estimates. Starting with

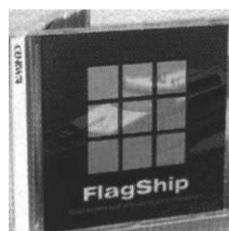
the lightship weight, any level of the breakdown structure can be estimated, or computed as the sum of the levels beneath it. At each level, an estimating method is defined, and the database is regressed to determine the estimating coefficient, and thus the weight and CG. The ships to be included in the regression can be sorted according to ship types and various parameters such as length or installed power, and a sister-ship can be given special influence in the estimate. In addition to the weight and CG, ShipWeight reports the uncertainty of the estimate, based on the standard deviation of the regression. This uncertainty measure makes it easy for the designer to determine what part of the estimate should receive the most attention. With these abilities, ShipWeight improves on the traditional spreadsheet approach to weight estimating. Any subset of the database can be included in the regressions, greatly enhancing the value of the user's database.

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E N G I N E E R I N G

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## CAD/CAM

### Onstream Project To Optimize FPSO Design

Noble Denton Europe Ltd. (NDE) was last month set to launch a new joint industry project aiming to improve FPSO design in order to optimize system safety and reliability, which will in turn lower operating costs and capital requirement. The study will focus upon reliability analysis and system modeling of critical limit states and follows on from a preliminary study, previously performed by NDE for the U.K. Health and Safety Executive (HSE). It acts as a catalyst to draw together current FPSO experience and will enable further development of the design process, through enhancing current understanding of the operational system behavior of FPSO's.

It will address the shortcomings within the current design process and issues

that have not yet been studied in any detail. The outcome is expected to identify cost-effective design improvements, based upon risk reduction benefits and life of field reliability. There is potential for producing optimized FPSO design guidelines and achieve a reduction in unnecessary construction and operational costs.

**Brian Campbell**, project coordinator for the proposed study, said, "We are all very excited by the new project. We truly believe that the results will revolutionize the way FPSO's are designed from the front end of the process, which will have tremendous effects on structural safety issues as well as costs."

The project is set to commence in January 2001 and is scheduled for completion within a period of 18 months.

Industry interest was witnessed following distribution of the proposal and first launch meeting held in London on

October 23, as a wide range of companies have expressed a strong interest in the project. Interested organizations include BP, Shell, ExxonMobil, TotalFinnaElf, Statoil, Mineral Management Service, ABB, ABS, Maersk, DNV, Lloyd's Register, Bouygues Offshore, Bluewater, Bureau Veritas, Norsk Hydro, Fred Olsen Energy, and the U.S. Coast Guard.

### Napa Oy Introduces NAPA Steel System For Ship Design

Napa Oy (Ltd.) has introduced the NAPA Steel system, a new tool for ship structural design during the early design stages.

NAPA Steel is designed as a quick and flexible tool for use in designing ship structures and in managing the design process from the first sketches up to the classification documents. NAPA Steel's

modeling techniques is designed so that the model can be created early enough to meet both project and basic design needs.

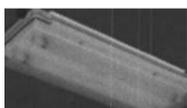
By using NAPA Steel, a 3-D product model of the ship's structures can be available within 50-500 man-hours, depending on the ship type and the details being modeled. NAPA Steel's main advantage is the flexibility of the 3-D product modeling process, which makes it possible to maintain a consistent model despite the frequent changes made during the early design stages.

The program is touted as providing a reduced risk of design errors; increased accuracy in estimating the ship's weight, center of gravity and strength; improved distribution of information concerning the design; reduced material costs; and fewer production man-hours as a result of better planning.

The 3-D NAPA Steel model provides

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various departments and subcontractors with up-to-date information including a bill of materials, welding lengths, painting areas, weights and man-hours. Any item of information can be extracted for freely limited building blocks, selected panels, assemblies, object type, type per material or any subset of interest.

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### Unicom Of Cyprus Chooses Autoload/LPS

Autoship Systems Corp. announced that Unicom Management Services (Cyprus) Limited (UNICOM) has purchased Autoload/LPS, an integrated RoRo load planning system for Byelorussia, a 5,400-dwt Russian built RoRo ship.

Autoload/LPS will form a key part of UNICOM's strategy to maintain a high level of compliance with ISM Code requirements. Onboard the Byelorussia,

Autoload/LPS will be used to develop the ship's loading conditions throughout the vessel's voyage. An intuitive graphical user interface will allow the Autoload/LPS program user to create a visual representation of the ship's cargo condition at each port of departure. A real-time interface with a type approved hydrostatic engine will permit an instantaneous assessment of hydrostatic and longitudinal strength values. The ship loading conditions will be electronically transmitted to UNICOM's head office in Cyprus where ship safety will be monitored.

As of July 1, 1998, the International Management Code for the Safe Operation of Ships (ISM Code) became international law for certain categories of vessels of over 500 gross tons. Other cargo vessels and mobile offshore drilling units of 500 gross tons and over must comply with the ISM Code by July 1, 2002.

### Autoload Now Rolls Royce Marine Standard

Autoship Systems Corp. (ASC), and its Norwegian partner Coastdesign, (CDN) have jointly announced that Rolls-Royce Marine AS (formerly the Ulstein group of companies) has chosen Autoload as its standard delivery stability monitoring software.

In cooperation with Norwegian yards, ship owners and ship crew, a tailored version of Autoload has been designed for the Ulstein designed supply and service vessels. Given the 3-D Ship model, Rolls Royce will no longer need to generate tabular data required by their former table-based loading computers.

A fully automatic link between the Rolls-Royce Marine design database and that of Autoload will ensure accurate and effortless transfer of 3-D ship model information between the systems.

The result will be time saved in the

system design and classification approval processes.

Circle 10 on Reader Service Card

### EnSolve Biosystems' Senior Scientist Receives Top Honor

Dr. Donald W. Kelemen, senior scientist of EnSolve Biosystems, has been selected as an honoree for the 2000 American Chemical Society's Industrial Innovation Awards Program.

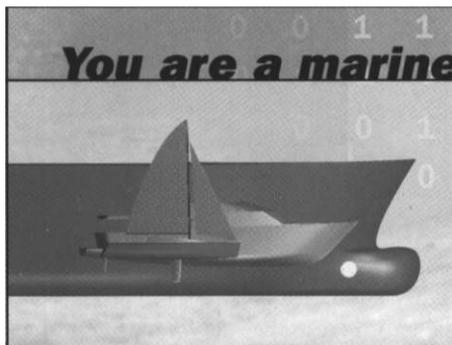
Dr. Kelemen is a co-founder of EnSolve Biosystems and played an instrumental role in the development of the PetroLimiter, the first biomechanical oily water separator for the marine industry.

The PetroLimiter is a patented system that uses a combination of mechanical separation and bioremediation to treat bilge water so that it can be safely discharged overboard in environmentally sensitive waterways. Introduced in early 2000, the PetroLimiter has been type approved by the U.S. Coast Guard, IMO and Canadian authorities to meet international clean-water standards. The system has successfully completed sea trials on a cargo ship in the Great Lakes.

The American Chemical Society Industrial Innovation Awards are presented annually to individuals whose creative innovations have contributed to the commercial success of their company and consequently the good of the community.

The award was presented to Dr. Kelemen at a ceremony on December 8, 2000, in New Orleans.

Circle 28 on RSC



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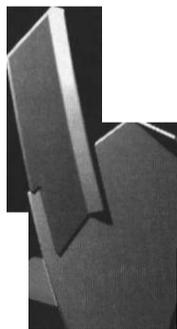
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## ShipConstructor

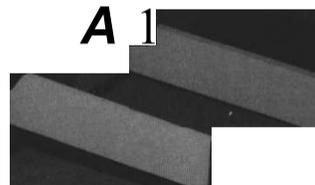
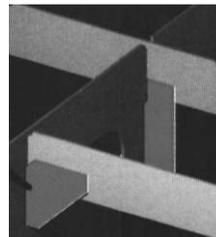
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### ASA Holds First Annual Meeting

The American Salvage Association (ASA) held its first annual general meeting in New Orleans on December 4, 2000, at which time it initiated its 4 C's Program — Communication, Cooperation and Competent Completion. Focusing on the need for continuous professionalism in the marine salvage industry, ASA members agreed to increased capital expenditures, expanded training and an experienced labor pool to complement the expanding interest by the U.S. Government as well as the States in the field of marine casualty response.

*The responsibility of melding, developing and profitably leading one of the world's most prolific high-technology marine companies is, to say the least, a daunting task. Assuming the post with no marine industry experience would seemingly make the job all the more difficult. But Dr. **Saul Lanyado** (pictured right) enters his position as the new president of the Rolls-Royce Marine division armed with years of engineering and business success and savvy. Maritime Reporter recently sat with Dr. Lanyado in his Buckingham Gate, London office to discuss the company's current endeavors and future developments.*

— by Greg Trauthwein, editorial director



At the outset of a discussion regarding Rolls-Royce's marine business, it is immediately evident the direction in which one of the world's new leading players in marine propulsion is heading. Rolls-Royce, which arguably possesses one of the world's brand names most closely linked to superior quality, will heretofore be regarded as a high technology company. While the company is well regarded for its engineering and manufacturing prowess, and has effectively assembled a wide range of brand name marine propulsion, deck machinery and ship design products and companies, the future lies in its ability to develop and/or acquire

more advanced, integrated ship systems for both the naval and commercial markets.

Yes, *acquire*.

While Dr. Lanyado was, naturally, not at liberty to tip his hand on imminent deals or interesting prospects, he admitted that Rolls-Royce may not be finished in terms of acquisitions, and he views prudent investment — either internal or external — as an expansion of the company's capabilities. "There are a number of companies, both large and small, that appear attractive," he said. "As a group, we are constantly looking for affordable opportunities." Noting that the mechanical side is

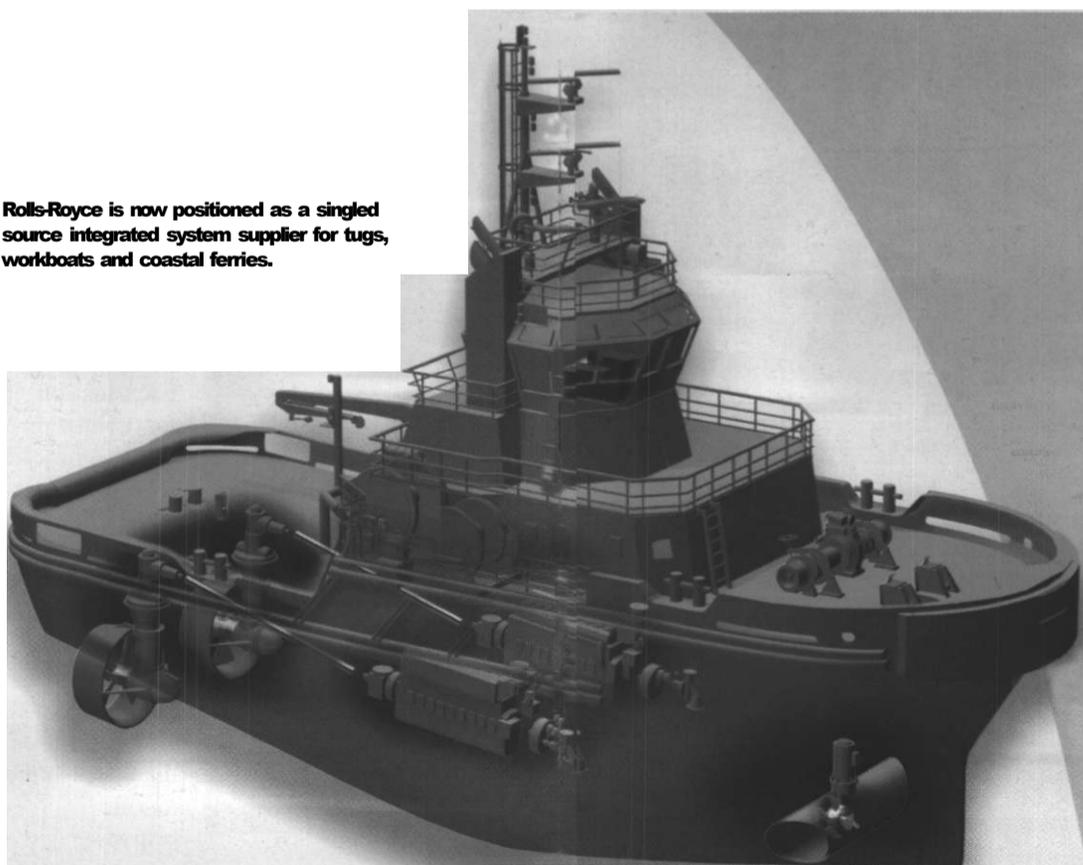
just one aspect of today's complex, integrated ship power system, he said that acquisition or partner companies of particular interest: the "new" areas of propulsion, Electric and Electronic, or motors that are not dependent on mechanical linkages.

Regardless of future prospects, Rolls-Royce's management task at hand from its London headquarters, in the near term, remains a formidable one, that being the seamless integration of the company's current divisions. Best known, perhaps in the marine realm, for its gas turbine technology, Rolls-Royce is in reality a conglomeration of some of the biggest names in marine products, including Ulstein, Kamewa, Brown Brothers and Michell Bearings.

To put Rolls-Royce's marine business in a financial perspective, the corporation generates approximately 6 billion pounds (\$8.8 billion) annually, of which 1 billion pounds (\$1.4 billion) is marine business, or about 15 percent of the company turnover. Current estimates from the company places the overall value of the marine market at about 40 to 50 billion pounds (\$58.9 to \$73.6 billion) annually, with approximately 4 to 5 billion pounds (\$5.8 billion to \$7.3 billion) spent in "our sector," giving Rolls-Royce an approximate 20 percent plus market share. Dr. Lanyado's aim is to increase this percentage significantly, effectively making it the dominant player in the market.

The company offers a vast array of marine products and services for both military and commercial applications, serving vessels both large and small, ranging from ship design, ship equipment and integrated systems solutions. These individual brands, not too long ago, were independent companies with strong allegiance from both employees and customers alike. The challenge: maintaining the local company strengths (the point of the acquisition in the first place) by effectively managing an array of cultures, products and managements systems while assimilating the Rolls-Royce philosophy and strengths throughout the system.

**Rolls-Royce is now positioned as a singled source integrated system supplier for tugs, workboats and coastal ferries.**



### Leaving His Fingerprints

Dr. Lanyado's high-tech background more than likely was a leading factor in his selection as the man to lead Rolls-Royce Marine into the new millennium. Graduating with a BSc (Honors) degree, first class in Electrical Engineering from University College in London, and later earning a MSc and PhD in Computer Science at Manchester University, his course includes progressively high-ranking posts at world-leading electronics companies.

Most recently he served as Group Managing Director of the airborne electronic systems group at GEC Marconi Avionics.

On the gargantuan task of successfully melding the many facets of his current unit, he flatly states "I will get personally involved."

He notes that his career has been spent in the international marketplace, working across many cultures simultaneously. And while the job of getting all units on the same page may appear daunting, the premise that will guide him is the autonomy of companies to act in the manner, which made them successful in the first place.

"Regardless of Rolls-Royce history, the individual companies are the world leaders, and we have the challenge to make sure that we manage them well," Dr. Lanyado said.

While he promises hands-on involvement, his management style is one that encourages innovation, and values motivation rather than control. "I think it has been shown (in high-tech industries) that you must capture people's imaginations, and while you have control of them in the corporation," you allow them much leeway to encourage innovation, which is the fuel for growth.

Specifically, Dr. Lanyado believes that while it is sometimes easy to revert all decisions back to fiscal considerations, it is crucial to consider products and people equally with the bottom line. In the development of new or improved products and systems, he strives to marry the concepts of cost with innovation as early in the process as possible, which he believes will result in exciting, marketable products.

The present and future of the company all rolls back to the famous name, a name that Lanyado admits "is a great responsibility to keep up."

The Rolls-Royce name and corporate presence is deemed attractive to the marine community as it provides first and foremost, a global reach for its product and service solutions. Beyond the polish of the company placard, however, is the ability of local organizations to extend the level of local service that will maintain happy clients and promote

the company to new ones. This should serve as a strength in the new organization, as the company has assembled a roster of traditional marine companies well regarded for product and services. Lanyado places a high value on localized customer care, calling the local the companies and employees diplomats for the company.

### WR-21 Nearly Ready For Market

Despite the many strategic additions to its marine product line-up, the gas turbine remains a central focus in the company's endeavors in both the naval and commercial realms. In an attempt to gain valuable market share against its rivals, Lanyado said that much effort and capital is being invested in the

expansion of the gas turbine portfolio, as it is being pushed into the 25, 30 and 50 MW power ranges to fill gaps in power range coverage.

In late October the company announced a strategic agreement between it, Northrop Grumman and

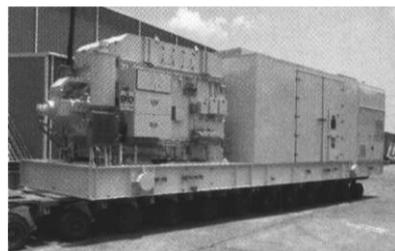
(Continued on page 50)



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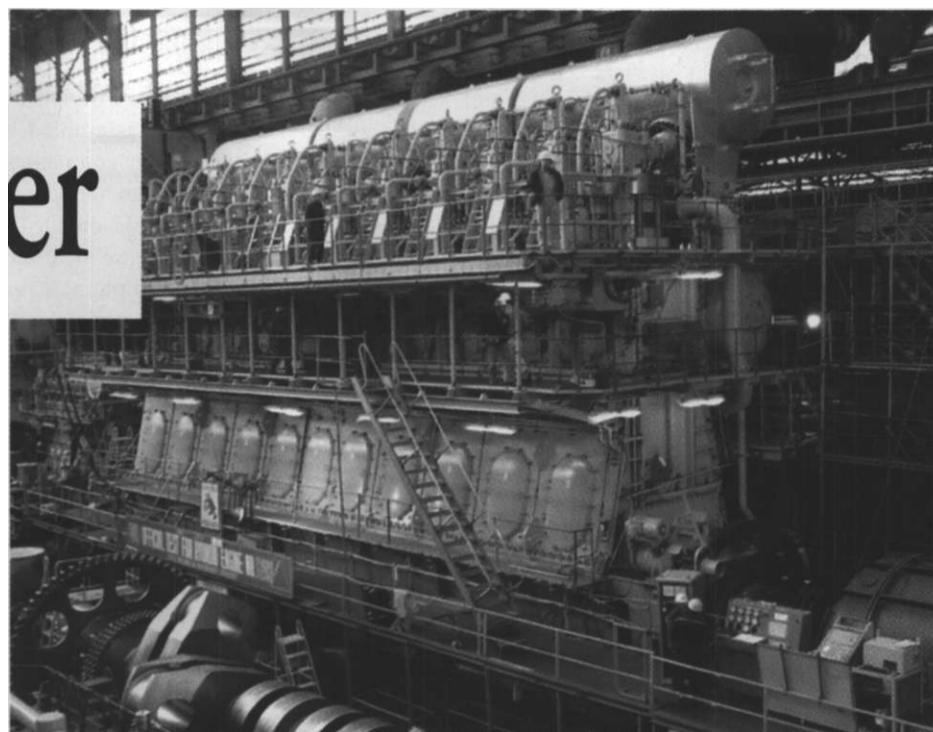
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Circle 247 on Reader Service Card

## Marine Propulsion Report

*The impact of increasingly stiff rules from legislators regarding ship engine emissions combined with ever increasing demands from ship and boat owners of better life-cycle performance and fuel economy has placed the onus squarely upon the diesel engine manufacturing community to continuously improve products and systems. While the diesel engine community has responded in kind with a variety of enhanced designs and concepts (see Carnival Spirit story, page 50), there is a revolution spurred by evolution brewing in academia which promises to, at the very least, arm diesel engine makers with a system to quickly and cost effectively optimize current diesel engine performance, and to possibly even help to reshape the diesel engine's inner and outer appearance in the name of improving performance.*



A modern MAN B&W diesel engine.

### A Design For The Ages

Developed by Paris-born Rudolf Diesel, the diesel engine today — despite numerous refinements, enhancement and improvements — remains very similar to the prototype produced in 1893.

The diesel engine is a timeless power unit that used the newly discovered principles of thermodynamics as a potential replacement to the then efficient gasoline engine. In 1885, Diesel set up his first shop-laboratory in Paris and began his 13-year process of inventing the engine that would bear his name. At Augsburg, on August 10, 1893, Diesel's prime model, a single 10-ft. iron cylinder with a flywheel at its base, ran on its own power for the first time.

Diesel spent an additional two years improving the original design, and on the eve of 1897 demonstrated a model that boasted a theoretical mechanical efficiency of 75.6 percent, as opposed to the prevailing efficiency of the steam engine of approximately 10 percent or less.

On January 28, 1898, B&W acquired the rights to use the patent of Diesel. The first engine was delivered by the company in 1904 to N. Larsens Vognfabrik in Copenhagen to produce electricity for lighting. The engine type was a DM140, i.e. a one cylinder with an output of 40 hp at 180

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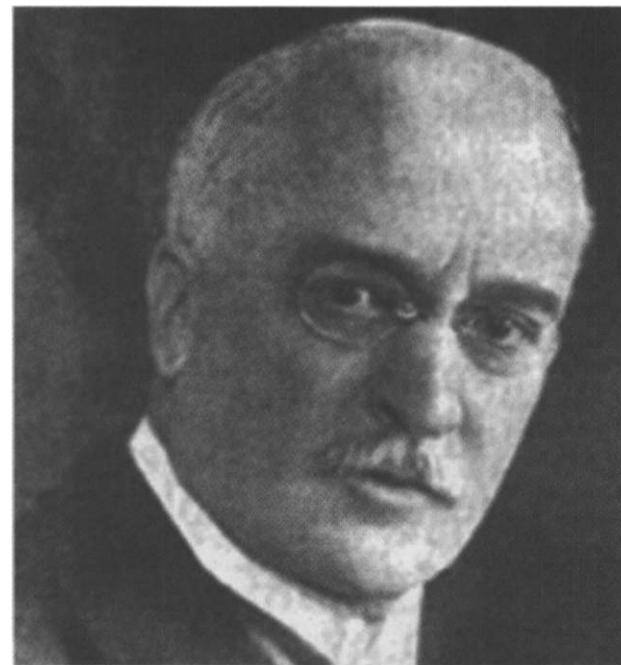
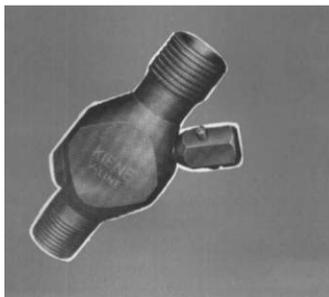
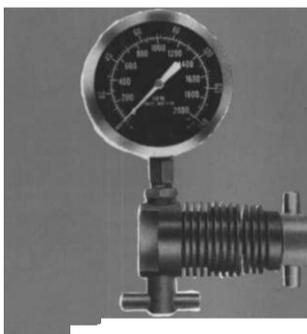
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Dr. Rudolf Diesel

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rpm. The cylinder diameter was 320 mm and the stroke was 490 mm. The demand for diesel engines in marine applications quickly grew, and circa 1909 B&W engineers developed a reversing mechanism, which enabled the engines to run in both directions. The following year, diesel engines were being built for the world's first oceangoing motorship, M/S Selandia.

#### Survival of the Fittest

Improving upon Rudolf Diesel's initial design has been non-stop work, and in recent years much effort and countless millions of dollars have been invested to enhance performance and reduce emissions. Legislation demanding lower emissions and customer demand for more sturdy, fuel efficient products have been the primary drivers of diesel engine development, with the former having more tangible and immediate impact.

The process of simulating diesel engine designs via computer is hardly a new development, as various levels of

**The results recorded reported and confirmed in a real-world test showed significantly (approx. 15 percent) less fuel consumption than the baseline engine, with 70 percent less NOx and 50 percent less soot.**

research, development, and testing have been deployed by engine makers for many years. But the specter of focusing on the entire engine, specifically tweaking any given number of factors while seeking the optimum performance parameters that cuts emissions while improving fuel economy and life-cycle performance, among others, was a process that — in real world trials could take practically forever — and in the computer lab could quickly clog even the most prolific of machines.

Scientists at the University of Wisconsin have developed what they believe to be the best approach.

Using the recently developed KIVA-GA computer code, the researchers are performing full-cycle engine simulations within the framework of a Genetic Algorithm (GA) global optimization code. In short, Dr. Rolf D. Reiz and his colleagues have devised a computation-

al design methodology for the optimization of internal combustion engines with respect to a large number of parameters (injection timing, injection pressure rate-shape, combustion chamber design, turbocharging, etc.)

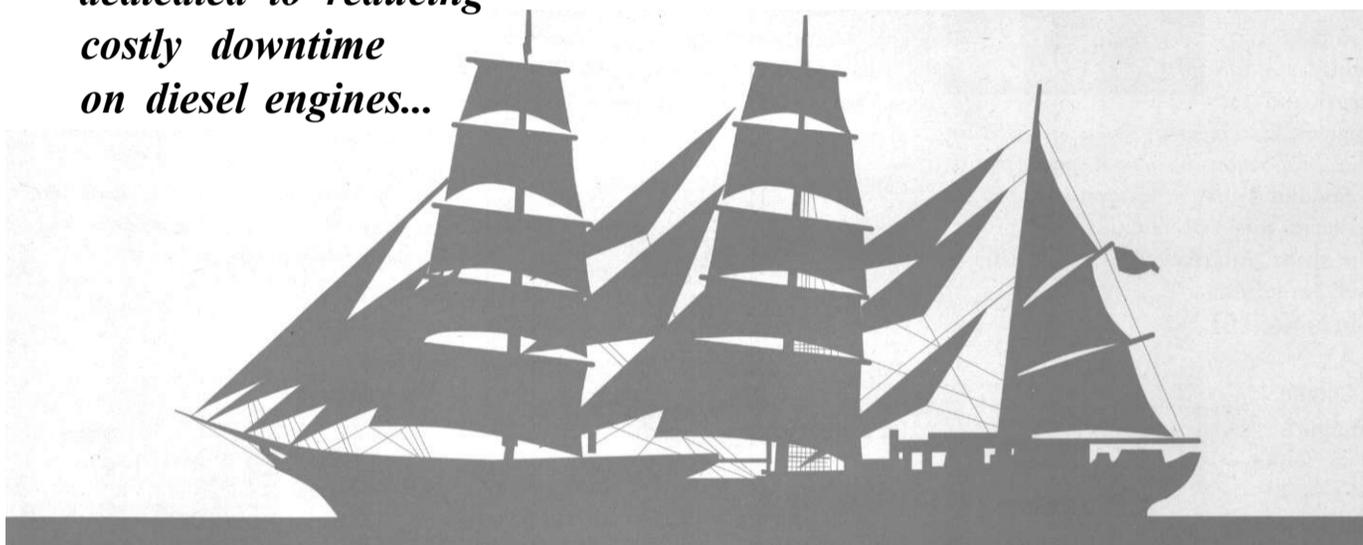
The interesting aspect of the study, which it should be noted has currently only been conducted for diesel truck

engines, is that it combines computer technology with Darwin's Theory of Evolution. Genetic Algorithms — which have been successfully applied to design problems ranging from laser systems to reinforced concrete beams — are global search techniques based on the mechanics of natural selection, combining a "survival of the fittest"

approach with some randomization and/or mutation. For the purpose of diesel engine optimization study, "mutating genes" can be thought of as tweaking the variables. In the study, the machines literally competed against one

*(Continued on page 50)*

***In 1940, a young ship's engineer started a company dedicated to reducing costly downtime on diesel engines...***



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## Ship's Store: Marine Propulsion

Ship's Store is the evolution of Marine Literature Review, and will be featured in each edition of *Maritime Reporter & Engineering News* and sister publication *MarineNews*. In addition, these product category focused reports are available on-line at [www.marinelink.com](http://www.marinelink.com). To have your company considered for a profile in an upcoming edition, contact your sales representative for a listing of topics and issues.

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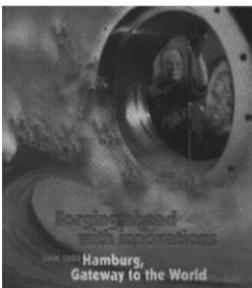
years ago in Hamburg. This marked the beginning of an unprecedented product offensive at REINTJES GMBH and is thus the focus of the current issue of Reintjes Report. For more information visit [www.reintjes-gears.de](http://www.reintjes-gears.de), or

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ufactures, licenses, markets and services Wartsila and Sulzer engines from 500 to 66,000 kW (700 to 90,000 bhp). The company engineers and provides complete propulsion systems for all vessel types and turnkey power plants from 1 to 300 MW. For more information, <http://www.wartsila.com>, or

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### MAN B&W

MAN B&W Diesel has put great effort into developing their engines to operate with invisible smoke exhaust gas to allow cruising in regions where it is of utmost importance to observe the local environmental regulations. In 1998 MAN B&W Diesel commenced the implementation of a smoke reducing package for cruise liners travelling in the Arctic Sea of Alaska.

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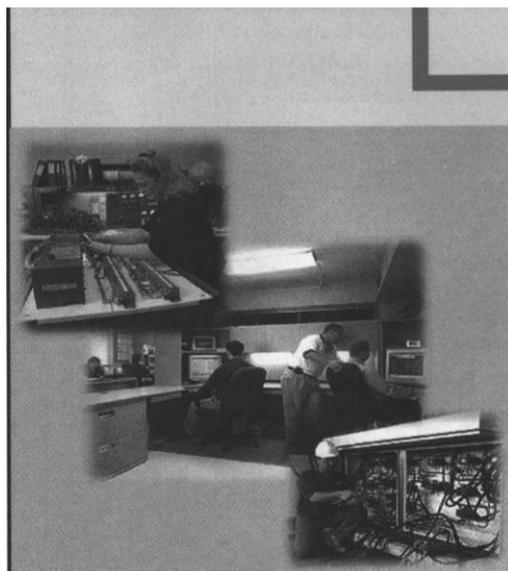
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### Maritime Reporter & Engineering News

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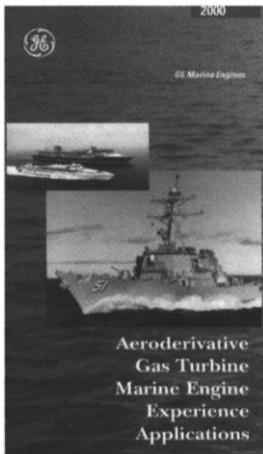
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Vericor Power Systems—an innovative company, was established on October 1, 1999 to assist industrial and marine customers sort through the maze of energy and propulsion choices. Vericor Power Systems can clarify what options offer the best value

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As a 50/50 joint company between Honeywell Engines and Systems of Phoenix, Arizona and MTU Aero Engines and München, Germany, Vericor Power allows industrial and marine customers to exercise their freedom of choice when selecting energy systems and services.

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## Marine Propulsion Report

while pitching, yawning, rolling or heaving. An Omnithruster can even produce thrust while a vessel is underway at sev-

eral knots, a condition in which conventional propeller thrusters are subject to cavitations and do not produce thrust, if at all.

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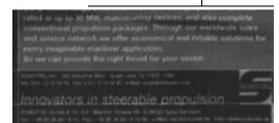
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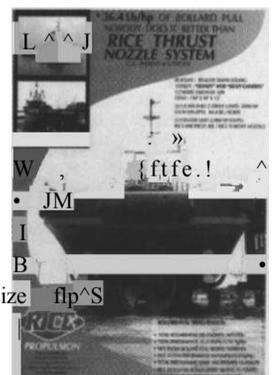
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PROPULSION



(Continued from page 43)

French marine engineering company DCN to produce and market the WR-21 Marine Gas Turbine Engine. With an eye on providing primary power units for the world's naval fleets while continuing its efforts to infiltrate specialized commercial markets, the agreement is touted as the establishment of a world class team for the intercooled and recu-

perated WR-21. The WR-21 engine has successfully completed the development phase of the U.S. Navy, Royal Navy and French Navy funded full-scale development program in February 2000. The final phase of the WR-21 program is now started, with a 3,000-hour endurance qualification currently underway at DCN's Indret facility. The test is

scheduled for completion in early 2002. In an effort to break competitor's GE's stronghold on the marine gas turbine business, Rolls-Royce points out that the WR-21's advanced cycle recovers energy from the engine's exhaust gas to increase fuel efficiency across the operating range. "The intercooled and recuperated WR-21 has already demonstrat-

ed more than 25 percent annual fuel savings in mechanical drive configurations, compared with existing simple cycle gas turbines, and is on track to reach more than 27 percent in its final production configuration," said **Jim Hupton**, vice president of Northrop Grumman Marine Systems.

(Continued from page 45)

another, with the strongest surviving and serving as the basis for future generation designs. The process was repeated until the evolutionary winner, which optimized fuel efficiency and performance while cutting emissions, emerged. Ordinary GA's demand hundreds of "organisms" to be evaluated in each generation, but given the time consuming process of evaluating the diesel engine cycle, the researchers needed a better, more time-efficient way to test and evaluate. The present study uses Micro-Genetic Algorithm, which operates similarly in that it works on a family, or population of designs, yet it allows for a very small population size. For example, in a recent study, the design factors tested include: boost pressure, EGR Level, Start of Injection, Injection Duration, Mass in First Pulse and Dwell Between Pulses. The results recorded, reported and confirmed in a real-world test showed significantly (approx. 15 percent) less fuel consumption than the baseline engine, with 70 percent less NOx and 50 percent less soot. The present methodology provides a useful tool for engine designers investigating the effects of a large number of input parameters on emissions and performance.

## Wartsila Fits First "Smokeless" Diesel

In a working partnership between Carnival Corp. and the Finnish marine power systems supplier Wartsila Corp., the new 86,000-ton cruise ship Carnival Spirit will be fitted with the cruise industry's first smokeless diesel engines. The Carnival Spirit, the first ship in a new class for Carnival Cruise Lines, is currently under construction at Kvaerner Masa-Yards and is expected to enter service in late spring 2001. Initially, two of the ship's six Wartsila 9L46D engines will be modified with the new "smokeless" engine technology. The new modified engines represent the culmination of a year-long project between Carnival and Wartsila to develop the EnviroEngine power system. The modified engines, part of a diesel-electric propulsion system, represent one of the most environmentally-friendly power plants ever made available for cruise ships, exceeding the international standards for emissions set out in MARPOL Annex VI. "We are very pleased to install these state-of-the-art engines in the "Carnival Spirit" and look forward to the many environmental benefits provided by this important new technology. Carnival's cooperation and support has been very important to us," said Ole Johansson, President and CEO of Wartsila Corp. The two Wartsila 46 EnviroEngines use a common rail fuel injection system which enables injection pressures to be kept sufficiently high at all engine speeds - even at the lowest levels - to ensure clean combustion with no visible smoke emissions. The EnviroEngines will be particularly beneficial for use in port, as they produce no visible emissions even when lightly loaded for producing energy for lighting, air conditioning and other hotel systems. The EnviroEngine design is expected to be used for other vessels currently under construction, including 86,000-ton ships by Carnival Cruise Lines and for sister companies Holland America and Costa. Existing ships can be refitted by replacing the current fuel injection pumps with common rail components.

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Maritime Reporter & Engineering News

# Aloha Kittiwake - USCG Welcomes Bollinger-Built Patrol Boats

The newest Coast Guard vessel in Hawaii, the 87-ft. (26.5 m) patrol boat Kittiwake, was designed to venture out on the sea when the strength of other ships has failed, when the mystery of that ship and crew's limits has been solved. To the men and women of the 14th Coast Guard District and the hundreds of sailors the new vessel will rescue in the future, the arrival of the Kittiwake is a beautiful sight.

Kittiwake was officially commissioned on June 30 during a ceremony held at Coast Guard Search and Rescue Detachment Kauai in Nawiliwili Harbor.

Bollinger Shipyards built the \$3.5 million Marine Protector Class Coastal Patrol Boat in Lockport, La. to replace the Coast Guard Cutter Point Evans, a Vietnam War-era, 82-ft. (24.9 m) patrol boat that was transferred to the Philippines navy last December after serving the Coast Guard for 32 years.

The Coast Guard has contracted with Bollinger to build up to 50 of the new 87-footers. Prior to the award of the current contract, Bollinger designed and constructed all 49 of the 110-foot Island-Class Patrol Boats, which have been called the "best patrol boat in the world," by both a prior Commandant of the U. S. Coast Guard and a former Chief of Naval Operations. The captain and crew of the new ship hope the Bollinger's 87 footers will be even better and were thrilled to be receiving the new ship.

"Compared to the old 82's, the 87-ft. (26.5 m) Marine Protector Class patrol boat has better sea handling capabilities, a safer small-boat launching system, improved crew habitability, advanced navigation and electronics systems, a top speed of 27 knots, and it accommodates mixed gender crews," said Lt. j.g. Michael Schoonover, Kittiwake's commanding officer, who was also the C.O. of the Point Evans before it was decommissioned. "We're really excited."

Schoonover and the crew of the decommissioned Point Evans picked up the Kittiwake on December 2, 1999 at Bollinger Shipyards in Lockport, La. to learn how to operate the ship. After learning the ship's systems, the crew sailed Kittiwake to San Diego via the Panama Canal.

In San Diego, the ship was hoisted 100 ft. (30.4 m) into the air and placed in a custom built cradle on the deck of the USS Essex, a Navy amphibious assault ship, for the transpacific journey to Pearl Harbor. While the ship is well suited for coastal patrolling, its 900 nautical mile range would not permit the ship to make the 2,300 nautical mile trip from San Diego to Hawaii.

Once in Pearl, the ship was hoisted off the Essex, towed to Coast Guard Group Honolulu on Sand Island and made ready for sea. After supplying and refueling at Sand Island, the Kittiwake put to sea under her own power for the first time in the Hawaiian Islands. The ship left Sand Island, headed for Kauai and arrived in Nawiliwili Harbor four hours later. With its two 1,400 horsepower MTU 8V396TE diesel engines, Kittiwake made the trip twice as fast as the Point Evans' best record.

Speed is not the only advantage the Kittiwake holds over the Point Evans. Kittiwake's steel hull and aluminum superstructure were designed to handle 30-foot sea conditions and house an innovative stern-launch and recovery system for its deployable diesel-powered waterjet small boat.

The ship has quarters for a mixed-gender, 10-person crew, and is in compliance with all current and project-

ed environmental protection laws.

"The quality of living on the 87's is 100 times better than the 82's," said BM3 Marc Snyder, a deck force supervisor aboard the Kittiwake. "It's a much better ride. The 82's had a round bottom and they were like a football in the water. The 87's have chines, so they don't bob around nearly as much."

A large pilothouse provides 360-degree visibility, while enclosing an integrated and sophisticated state of the art command and control system, which includes electronic chart displays, an advanced surface search radar, and the Coast Guard's Standard Work Station III computers to improve the crew's ability to perform Search and Rescue and Maritime Law Enforcement missions.

The new computers also give the crew access to technical publications and drawings on CD-ROM for more efficient maintenance and repairs.

But even with all the benefits the cutter's advanced technology affords the crew, the Kittiwake and the Coast Guardsmen who serve on her still have their work cut out for them.

The Kittiwake has assumed the Point Evans' Area of Responsibility, which extends 200 miles from the eight major Hawaiian Islands. This will regularly take the ship through each of the notoriously dangerous inter-island channels as it performs its primary missions of search and rescue and law enforcement. In this AOR in 1999, the Point Evans saved 60 lives and over \$1 million in property.



Sate . 56?

At the Kittiwake's commissioning, the new cutter also received a new commanding officer. Lt. j.g. Schoonover turned command of the ship over to

Lt. j.g. **Jennifer Cook**, a 1998 Coast Guard Academy graduate, coming from a tour as the combat information officer and administration officer aboard the CGC Rush, a 378-ft. (115.2 m) High Endurance Cutter homeported in Honolulu.

Since the commissioning and change of command, the Kittiwake and her crew have continued training and are ready and waiting for the Search and Rescue alarm to send them out to test their highly capable new ship and their own courage against foul seas and howling winds.

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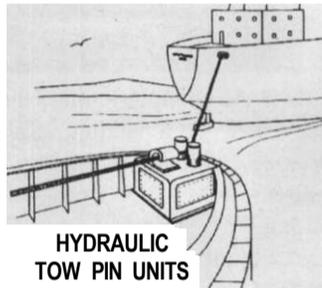
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## People & Company News

### ARCOMS Reports 3Q Results

Advance Remote Communication Solution Inc., (ARCOMS), formerly Boatracs, reported total revenues of \$3.7 million for the three months ended Sept. 30, 2000, compared to total revenues of \$3.5 million for the comparable quarter of the prior year, an increase of 5 percent. Net Loss for the quarter ended Sept. 30, 2000 was \$748,000 or \$0.04 per share compared to net loss of \$254,000 or \$0.01 per share for the

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**Maritime Week**

quarter ended Sept. 30, 1999. Total revenues for the nine months ended Sept. 30, 2000 were \$10.7 million, compared to total revenues of \$9 million for the nine months ended September 30, 1999, an increase of 19 percent. Net loss for the nine months ended Sept. 30, 2000 was \$2.7 million or \$0.13 per share, compared to net loss of \$413,000 or \$0.02 per share for the prior comparable nine-month period.

### Furuno Wins NMEA Awards

Furuno won seven awards at the 2000 National Marine Electronics Association (NMEA) Convention in Ft. Myers, Fla. Furuno's new FCV1200 Dual Frequency Fish Finder was selected this year's Best Of The Show. This product features a 10.4-in. color TFT LCD and comes with an easy to set 1, 2 or 3kW (RMS) transmitter. Additionally, this unit has a Furuno Free Synthesizer (FFS) transceiver, which allows easy selection of a broad range of operating frequencies from 15 to 200 kHz. Holding the title for the Radar-Commercial category was Furuno's FR2105 series of radars.

This unit represents advanced microprocessor engineering and collision avoidance features. The FR2105 radar provides a 21-in. multi-color CRT display with plenty of space for on-screen alphanumeric data.

### C-MAP Receives Award For Vector Charts

C-MAP, manufacturer of electronic cartography, has again received the NMEA (National Marine Electronic Association) Award for best Vector Charts for the year 2000.

The award was presented to C-MAP/U.S.A. vice president and general manager **Ken Cirillo**, at the recent NMEA convention in Ft. Myers, Fla. The award is voted on by a cross section of the marine electronics industry, ranging from dealers and manufacturer's reps to Certified Marine Electronics Technicians.

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### KVH Wins Third Year In A Row

For the third year in a row, KVH Industries has earned "best product" awards from the National Marine Electronics Association (NMEA); in every category its products were eligible. KVH swept the satellite communications categories.

The Trac Vision 4, a new product introduced in 2000 based upon last year's award-winning TracVision 3

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design, was voted best Satellite Television System, and Tracphone 25 was again named Best Satellite Communications Product. The company's Azimuth 1000 was voted Best Electronic Compass, winning the NMEA award for the third year in a row. TracVision 4 is unique and uses KVH's integrated DVB technology to provide foolproof satellite acquisition, and to allow users to select between different satellites if desired to receive local programming or Internet broadcasts. With TracVision 4, mariners can access 200 channels of direct broadcast satellite up to 100 miles off the North American coast.

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### DCMT Offers Varied Services

DC Maritime Technologies, (DCMT) are electrical engineers and systems integrations providing specialist service in marine electrical engineering. DCMT's recent projects include the conversion of the casino boat, Miss Belterra, at Alabama Shipyards and the off-shore supply vessel Astro Barracuda at Atlantic Marine.

Circle 9 on Reader Service Card

### RINA Strengthens Management System

Italian classification society RINA has put in place a series of initiatives designed to strengthen its management and enhance service. RINA is better defining the lines of responsibility for technical and operational activities of the Marine Division, fully separating it from industry certification activities. RINA has also reinforced its systems for training, qualification and supervision of RINA surveyors, to ensure surveyors are trained for and matched to the level of work required.

Since the beginning of the year, RINA has implemented a special surveillance scheme, aimed at improving the quality of its classed fleet. The scheme which has been applied for both ships in service and new entries, has led to 155 ships having class withdrawn and 29 ships not being accepted for entry into class.

### Schlumberger Closes Transaction With Baker Hughes

Schlumberger Ltd. has closed the transaction with Baker Hughes Inc., which creates the seismic joint venture WesternGeco. The company also reported that the former president of Eastern Geophysical, **Gary Jones** has been named president of WesternGeco. Jones will report directly to **Andrew Gould**, executive vice president of Schlumberger Oilfield Services.

Under the terms of the transaction, Schlumberger paid \$500 million in cash to Baker Hughes. Western is owned 70 percent by Schlumberger and 30 percent by Baker Hughes.

### PCCI Member Recognized for Excellence

**Craig Moffatt** of PCCI was awarded the Department of Transportation Secretary's Team Award for his accomplishments as a key member of the Viscous Oil Pumping and Lightering Workgroup, which was formed to resolve viscous oil pumping problems that occurred during the response to three major oil spills in the past five years. As the engineering contractor supporting the U.S. Navy Supervision of Salvage and Diving (SUPSALV), Moffatt coordinated efforts to devel-

op creative and innovative equipment, which significantly improved the Coast Guard and Navy's viscous oil pumping capability.

### Caterpillar Launches New Engine Line

Caterpillar Engine Products Division introduces the Cat 3000 Family, a new line of compact, fuel-efficient marine propulsion engines based on an environmentally friendly, in-line six-cylinder, four-stroke cycle diesel design. The new engines feature heavy duty components, long service intervals and an easy to service design to increase reliability and reduce operating costs in a variety of small commercial vessel applications. The initial offering available worldwide, includes three ratings for both keel cooled and heat exchanger cooled configuration: Cat 3056 TA (turbocharged, after cooled) 205 bhp (153 bkW) at 2,500 rpm; Cat 3056 TA (turbocharged, after cooled) 185 bhp (138 bkW) at 2,100 rpm; and Cat 3056 NA (naturally aspirated) 125 bhp (93 bkW) at 2,600 rpm. Both the 3056 TA and 3056 NA feature a high-tech rotary fuel injection pump and low inertia injection system that use less engine energy to move fuel to the injectors.

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### Teekay Appoints New Board Member

Teekay Shipping Corp. has elected Eileen A. Mercier to join its Board to fill the vacancy created by the retirement of Steve G. K. Hsu, effective Dec. 6, 2000. Hsu has served on Teekay's Board since June 1993. Mercier has over 30 years of experience in a wide variety of financial and strategic planning positions including senior vice president and chief financial officer for Abitibi-Price Inc. She has also served as president of

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### ASNE Offers Scholarships

The American Society of Naval Engineers (ASNE) is offering scholarships to encourage college students to enter the field of naval engineering and to provide support to naval engineers seeking advanced education in the field. ASNE has awarded 287 scholarships to students interested in careers in naval engineering. Scholarship awards are currently \$2,500 per school year for undergraduate students and \$3,500 graduates. The next awards will be for the college year starting in the fall of 2001. The recipients will be selected in March/April and announced in May 2001. Applications and supporting documentation must be received by Feb. 15, 2001. For further information and application forms contact Dennis A. Pignotti, ASNE Scholarship Committee, 1452 Duke Street, Alexandria, Va., 22314-3458; Phone (703) 836-6727; or visit the ASNE website at <http://navalengineers.org/>.

### NORSHIPCO Receives Enviro Honor

The Elizabeth River Project recently recognized NORSHIPCO as a top River Star for environmental contributions to improve the health of the Elizabeth



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The Elizabeth River Project granted River Star recognition to local businesses for their environmental achievements in creating and preserving more than 40 acres of wildlife habitat and eliminating more than three million lbs. of pollution in 1999-2000 alone. Only a handful of organizations have earned Model Level recognition since the inception of the program, and NORSHIPCO was the only shipyard to receive this level of recognition, the highest level possible in the River Stars Program. Model Level recognition acknowledges leaders in environmental stewardship with documented exceptional pollution prevention and wildlife habitat results. The Ford Motor Company, Naval Station Norfolk and NOVA Chemicals are among the other recipients of the honor. NORSHIPCO's environmental contributions include solving an international challenge for shipyards involving TBT, an additive in marine antifoulant paints. NORSHIPCO pioneered technology by forming a business/research consortium, the Center for Advanced Ship Repair and Maintenance (CASRM), in cooperation with Old Dominion University and two other local shipyards. The consortium has developed treatment technologies for removing up to 99 percent of TBT (tributyltin) from shipyard wash water.

NORSHIPCO's additional contributions to environmental protection include: Expenditures of about \$2.5 million for site improvements, including paving more than 46 acres and curbing 2.3 miles of roads and parking lots to reduce pollution from storm water runoff; development and implementation of alternative beneficial re-uses for various waste streams, previously sent to landfills for disposal. One of these uses pertains to spent abrasives. The material is mixed with soil and used locally as landfill day cover and road construction material; NORSHIPCO also sends paint wastes to facility where it is used as fuel for cement kilns; Employment involvement in 1998 in creating a wetland along a 400-foot section of the Elizabeth River Shoreline, lying within the shipyard facility.

### SOSA Earns Quality Certification

Hvide Marine reported that its Switzerland-based subsidiary, Seabulk Offshore, S.A (SOSA), has successfully met the requirements for certification under the International Safety Management (ISM) Code and

## 71 Countries Make IMO's Initial STCW White List

The 73rd session of the Organization's Maritime Safety Committee (MSC), formally endorsed the findings of a working group established to examine a report made by the secretary-general to the MSC, which revealed that 71 countries and one associate member of IMO has met the criteria for inclusion on the list. The 1995 amendments to STCW (The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers) which entered into force on Feb. 1, 1997 revised and updated the original 1978 Convention, setting out clearly defined minimum competency requirements for all seafarers and taking into account developments in technology since the 1978 Convention was adopted. A position on the White List entitles other Parties to accept, in principle that certificates issued by or on behalf of the parties on the list in compliance with the Convention.

It is expected that Port State Control inspectors will increasingly target ships flying flags of countries that are not on the White List. A Flag state Party that is on the White List may as a matter of policy elect not to accept seafarers with certificates issued by non White List countries for service on its ships. If it does accept such seafarers, they will be required by Feb. 1, 2002 also to have an endorsement, issued by the flag state, to show that their certificate is recognized by the flag state. By Feb. 1, 2002, masters and officers should hold STCW 95 certificates or endorsements issued by the flag state. Certificates issued and endorsed under the provisions of the 1978 STCW Convention will be valid until their expiry date.

The fact that a Party is not listed on the White List does not invalidate certificates or endorsements issued by that Party. Nothing in the STCW Convention prevents the employment of any seafarer who holds a valid certificate or endorsement issued by a Party of the Convention. Nevertheless, the White List will become one of several criteria, including the inspection of facilities and procedures that can be applied in the selection of properly trained and qualified seafarers. Countries not initially included in the White List will be able to continue with the assessment process with a view to inclusion on the list at a later stage.

The publication of the lists marks the end of the first stage of a groundbreaking verification procedure in which, for the first time, IMO has been given a direct role in the implement of one of its instruments. Panels of experts have spent much of the past two years engaged in rigorous assessment of information presented to them by Parties to the Convention concerning their ability to meet the standards enshrined in SCTW 95. Panel members were selected, as far as possible, to give a wide geographical spread and a broad coverage of the different facets of the Convention. These panels submitted their findings to IMO secretary-general William O'Neil.

## People & Company News

the ISO 9002 standard. Bureau Veritas Quality International approved ISM certification in September 2000. ISO 9002 certification was received from Bureau Veritas Germany and Bureau Veritas Switzerland late November 2000. SOSA fleet of mainly large, anchor-handling tug/supply vessels supports the expanding oil and gas exploration activ-

ities in the deepwater market off the coasts of Nigeria, Angola, Gabon, Equatorial Guinea, Congo and Cameroon.

### Chief Engineer Receives Trophy

The chief engineer, **Charles W. Brown** of Marathon Fla., will receive the 2000 American Merchant Marine

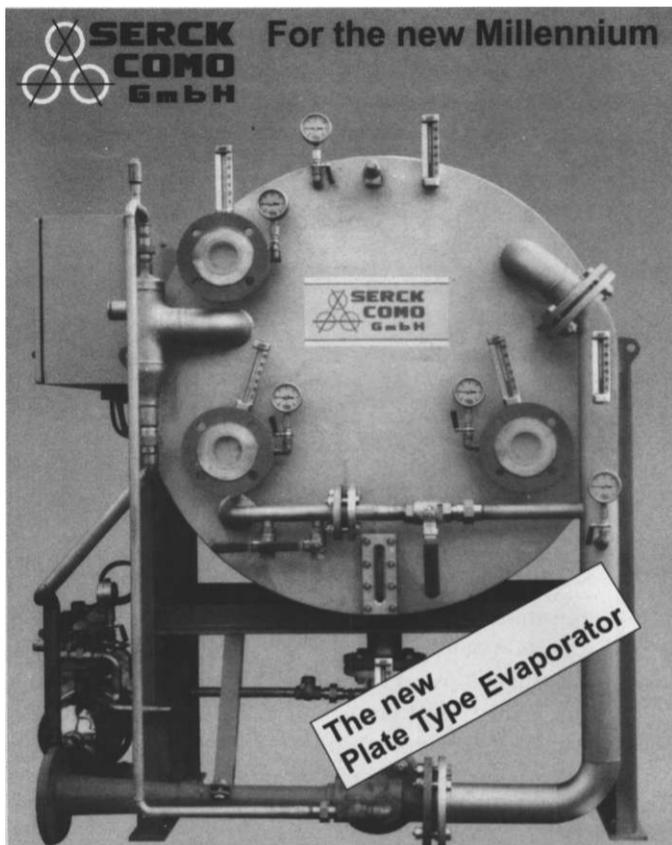
Seamanship Trophy later this month for his skillful action in helping to bring his severely damaged vessel to safety after a violent Atlantic storm on the night of Feb. 16, 1999. While he led his assistant engineers aboard SS Green Island, Brown displayed cooled competence when the storm opened a gaping hole in the ship's hull.

### New Executive Appointments

#### ATROCL

Royal Olympic Cruise Lines Inc, (ROCL), appointed **George Stathopoulos** to the position of acting chief executive officer. Stathopoulos at the same time maintains responsibility for the company's worldwide marketing and sales efforts. The company also appointed **George Kassapis** to the position of chief financial officer. The appointment of Stathopoulos to the top management post of the Company enables Dr. **Stelios Kiliaris**, who has served as chief executive officer since December 1999, to fully resume his position as managing director of the major shareholder, Louis Cruise Lines Ltd. He remains on the Board of ROCL and continues as a member of its executive committee.

Stathopoulos has been involved in the cruise industry for 24 years, having worked for much of his career in sales and marketing. He was appointed marketing and sales director for Festival Cruises when the company first began operations in 1993. Subsequently, he joined Celebrity Cruises as European sales and marketing director in 1995, continuing in that position following the merger of Celebrity Cruises and Royal Caribbean Cruise Line. Stathopoulos joined Royal Olympic Cruises as vice president for marketing and sales for Europe in 1998, and was promoted to the position of vice president of marketing and sales worldwide one year later.



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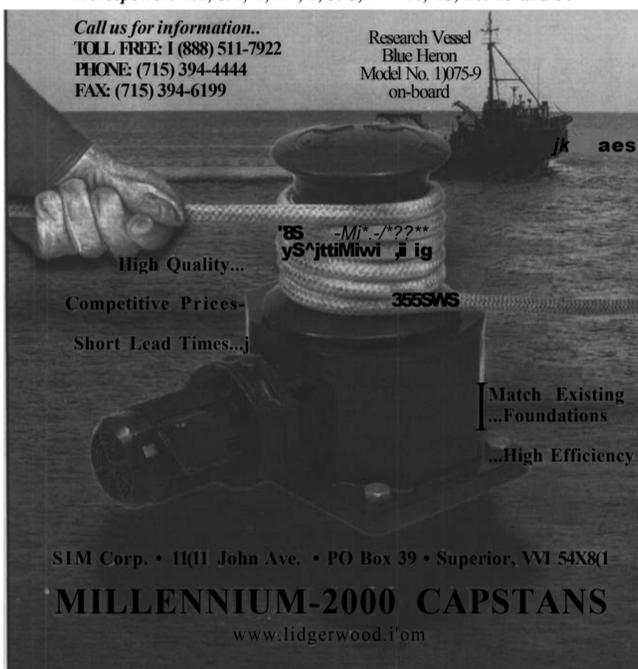
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DESIGNERS AND BUILDERS SINCE 1869

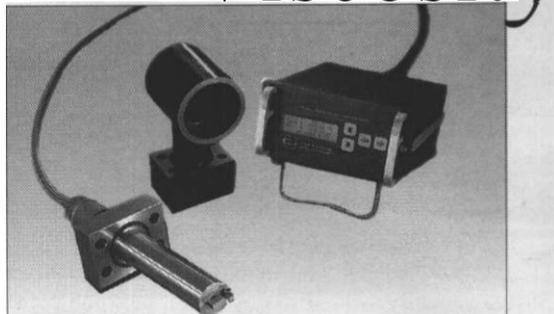
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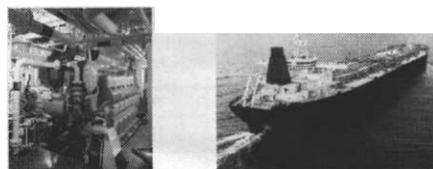


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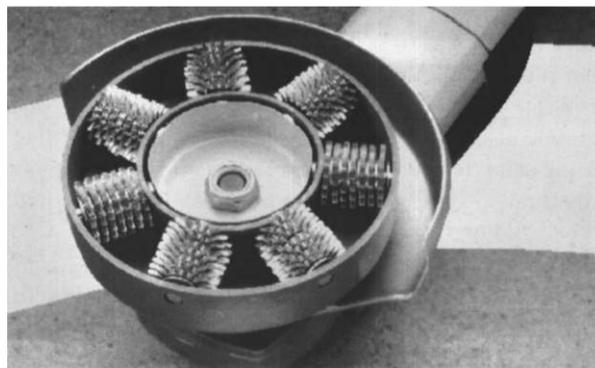
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### Nobeltec Announces

#### New Software

Nobeltec Corp., a developer of marine software has announced the introduction of all-new, exclusive features in its latest version of Visual Navigation Suite 6.0. One feature, the 3-D Navigator, allows the boater to navigate in three dimensions around fishing hot spots, navigation channels and harbor entrances. 3-D Maps contain elevation data for land and ocean floor giving the navigator a realistic perspective. The U.S. database of passport 3-D maps is included on a CD ROM inside each copy of the Visual Navigation Suite and each region can be unlocked with a code purchased over the Internet or through marine dealers everywhere. Nobeltec has also introduced the new Passport Global Data Solutions brand and logo. Passport data is a host of new data products for the mariner including navigation charts, 3-D Maps and onboard weather solutions. Passport data interfaces with Nobeltec's top selling Visual Series electronic charting software, including Visual Navigation Suite.

Circle 20 on Reader Service Card

## Contracts

### SJS Selected To Build

#### Panama Canal Tugs

Saint John Shipbuilding was awarded the contract to supply two new 4,000 hp tugs with an option on two others. The tugs will be built in Georgetown; Prince Edwards Island at East Isle Shipyard under the supervision of Bill Hind. Timberland Equipment will be supplying the deck equipment to East Isle Shipyard in the first quarter of 2001. Timberland's scope of supply consists of two series 651A Hawser Winches, one series 353H, 24 in. Hydraulic Capstan and a 160HP Diesel/Hydraulic Power Unit per shipset. On the bow, two Timberland series 651A Hawser Winches, each with a line pull rating of 8,000 lbs. at 230 FPM mid-drum. The drums are designed for under-wound configuration. Features such as, variable brake control, off-set rollers on the level wind and local controls are just a few options that will make this unit a favorite on the canal.

Aft, is a Timberland series 353H Hydraulic Capstan, complete with a 24 in. diameter cast steel head. Performance is rated at 20,000 lbs. line-pull at 30 FPM with a light line speed up to 60 FPM. Bollard rating at mid-height of capstan head is 30,000 lbs.

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### Halter Marine Awarded \$69M

#### Option For Car Carrier

Friede Goldman Halter Inc. announced that Pasha Hawaii Transport Lines had exercised an option with Halter Marine FGH's vessel construction division, for the construction of a second 579-ft. car carrier. The vessel is designed to transport more than 4,300 vehicles between the U.S. West Coast and Hawaii. Construction of the \$69 million vessel will take place at halter's Pascagoula, Miss., shipyard. The first vessel is currently under construction at the same facility, with delivery scheduled for the spring of 2002. The first vessel was financed under the U.S. Maritime Administration's Title XI program and financing of the second vessel will also be subject to MarAd's approval. The 13,000 dwt ship measures 579 ft. overall, with a beam of 102 ft. and a design draft of 25 ft. Propulsion will be provided by a single screw driven by a slow-speed diesel engine. The vessel will carry a complement of 23 and will be capable of maintaining a cruising speed of 20 knots. Construction will conform to Det Norske Veritas (DNV) standards and the vessel will be classed as an A1A Carrier upon delivery.

### 100th Mak Diesel Genset

#### Delivered To KWW

Caterpillar Motoren GmbH & Co., in Kiel, Germany, has delivered the 100th Mak diesel genset to Kvaerner Warnow Shipyard (KWW) in Rostock-Warnemuende, Germany, together with a further three M 20 gensets. The 100th



genset consists of Mak 8 M 20 with an output of 1,360 kW at 900 rpm for the container newbuilding 022 type WARNOW CV 2500. Since the acquisition by Kvaerner in October 1992, KWW has completed 35 container vessels, 32 of which were equipped with Mak diesel gensets of the engine series M 20 and M 25.

E X C H A N G E R S

# Tranter's On Board...

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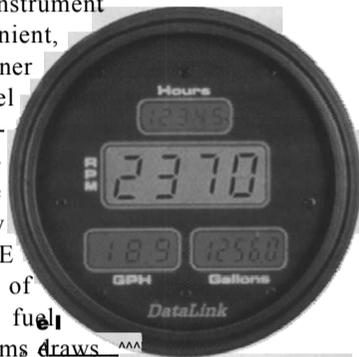
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## Monitoring & Control

As the marine industry steams towards ever higher levels of technological sophistication, the most marked advances, arguably, have been made in recent years in the area of vessel monitoring and control. As all vessels, from small harbor tugs to large VLCCs to the world's most sophisticated cruise and navy ships, move increasingly towards using more integrated systems and less crew, the ability for fewer humans performing more functions is only possible through advances in onboard products and systems. While geared toward providing information in a convenient and usable format, today's advanced monitoring and control systems are not limited to only reducing crewing levels. Advanced systems are able to not only provide immediate data to the bridge or home-office, but also provide historical perspective and analytical data that could be used to help vessel owners more efficiently and cost effectively schedule maintenance, for example. As diverse as the marine industry itself, the broad category of monitoring and controls can - as the ensuing product section will attest - from a simple fuel monitoring to total vessel data collection and evaluation.

### Fuel Usage Monitoring Made Easy

FloScan Instrument offers a convenient, economical manner to monitor fuel usage in electronically controlled marine diesel. The new FloScan 7000E Datalink series of Multifunction fuel monitoring systems draws fuel use information from the engine's data bus, then displays it on a standard 3 3/8-in. diameter digital instrument. Models are available for Detroit DDEC, Caterpillar E-Series, Cummins QS/IS and other electronically controlled diesels which operate on the SAE J1587 data protocol. Gallons per hour, total fuel consumed, rpm and trip time are displayed constantly.



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Ship Control Centers (SCC) which combine and automate all main bridge equipment operating functions inclusive of navigation, communications, engine control and alarm monitoring facilities. Designed for small vessels, the configuration features Atlas 12-in. radars, together with a Gearmar integrated monitoring and control system supported by a series of flat-screen displays.

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### Alstom Integrated Controls For Clough Offshore

Alstom's A Series, its popular range of integrated control system, was recently purchased by Clough Offshore. The A Series was launched last spring as a new, affordable system which encompassed all of the latest technology and design features sought by customers of Alstom's Marine and Offshore division. The system is designed around an industrial power PC processor for optimum speed, and the new control systems are designed to meet the exacting requirements for a complete range of vessels.

Specifically, an ADP21 duplex Dynamic Position System (DP) will be installed on the general purpose construction barge, Java Constructor, thus upgrading it to be one of the few DP vessels operating in the Asia Pacific region. The DP capability of the vessel will be a total of 7 MW of installed power. The enhancement allow the vessel to be classed as a self-propelled vessel with a 10-knot transit speed, and will also have a new motion suppression system installed.

Once completed, the vessel will be working in South East Asian and Australasian waters, where its primary operation will be rigid pipeline installation in S-lay mode on DP. The vessel will also be suitable for all construction support activities, including platform installation, diving operations and pipelay.

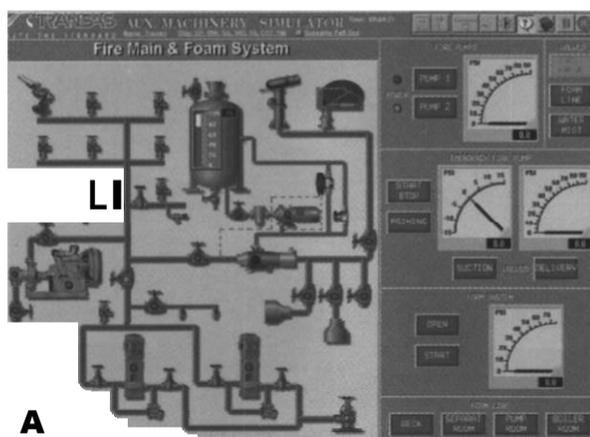
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### STN Atlas Updates SCC

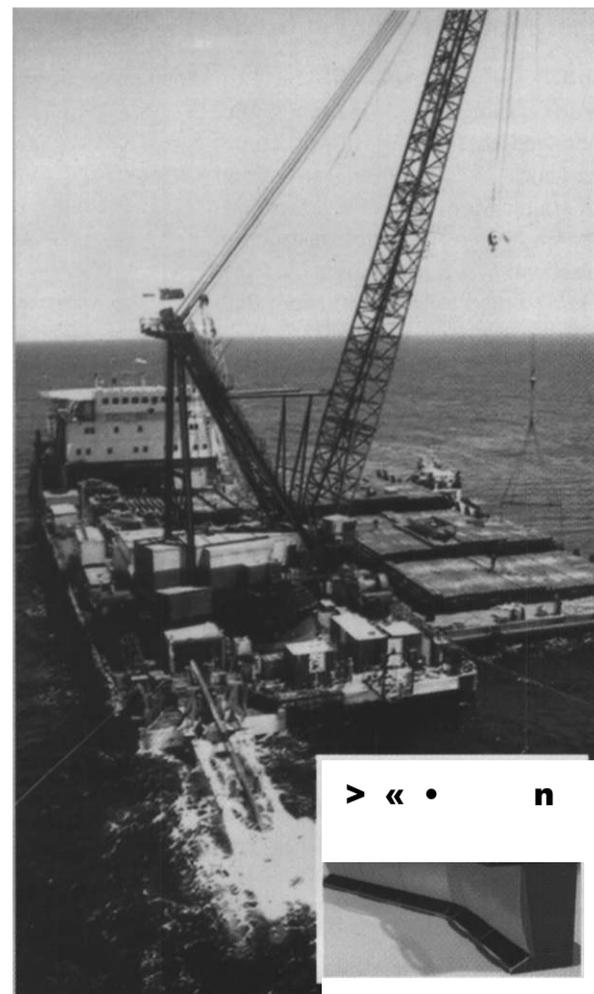
STN Atlas Marine Electronics at last year's SMM exhibition in Hamburg announced a new coastal shipping version of its established range of

## Transas Engine Room Simulators Offer Enhanced Capabilities

A new version of its Engine Room Simulator was introduced by Transas Marine at the beginning of November 2000. The Transas ERS 2000/3000 ver.5.3 features improvements to its functionality including enhanced modeling of the Steering Gear and of the interaction between Ship Diesel Propulsion plant, Ship Electric Power plant and Auxiliary Systems simulators. Transas added a number of subsystems to its Auxiliary Systems unit to simulate the use of the Engine Control Room as a fire prevention tool. These new subsystems include the Fire Main (water and foam) System, Fire Alarm Station, Engine Room Carbon Dioxide System (high pressure) and Actions in Case of Fire. Transas also designed a new-generation set of dedication hardware for the Ship Diesel Propulsion Plant, Ship Electric Power Plant and Auxiliary Systems simulators. The new dedicated panels and controls have been designed in full compliance with the latest equipment used onboard various types of vessels. Several maritime schools throughout the world are already benefiting from the technology developments introduced in the latest version of the Transas Engine Room Simulators. The Paul Hall Center for Maritime Training and Education, in Maryland, as well as two Spanish schools, the High Civil Maritime School in Coruia and the Marine and Fishery Professional Education School in Palma de Mallorca, are among the users of this equipment.



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# Ferliship's New Ship Contracts • November 2000

Ferliship is a strategic consultancy highly specialized in market researches guided to the shipping industry. For additional information, please contact Ferliship @: Pza. Sta. M<sup>a</sup> Soledad Torres Acosta, 2. 2<sup>o</sup> C, 28004 Madrid, Spain, Tel. : +34 91 531 01 78 , 689 01 45 66; Fax: +34 91 531 01 78' e-mail: ferlship@iies.es (Prices are in U.S. Dollars)

OWNER OPERATOR	COUNTRY SO	SHIPYARD	COUNTRY SB	TYPE	No	TEU	DWT	DEUV	PRICE M \$
GULFMARK OFFSHORE	US	AKER BRATTVAAG	NORWAY	AHTS	3	0	0	02/03	90.6
CHUAN HUP	SINGAPORE	PAN-UNIFIED SHIPYARD	SINGAPORE	AHTS	2	0	0	02	37
CUPPER GROUP	DENMARK	INP HEAVY INDUSTRIES	KOREA	BULK CARRIER	2	0	20200	02	25.2
AUGUSTEA MARIHIME	ITALY	NAMURAZOSENHO	JAPAN	BULK CARRIER	1	0	106000	603	42
MARUBENI CORP	JAPAN	SANOYASCORP.	JAPAN	BULK CARRIER	2	0	51800	02	0
GESTION MARITIME	MONACO	SHANGHAI SHIPYARD	CHINA	BULK CARRIER	2	0	32400	02	0
JAPANESE INTERESTS	JAPAN	SHIN KURUSHIMA	JAPAN	BULK CARRIER	1	0	23500	01	0
JAPANESE INTERESTS	JAPAN	SHIN KURUSHIMA	JAPAN	BULK CARRIER	1	0	52200	01	0
PAN OCEAN SHIPPING	KOREA	HYUNDAI MIPO	KOREA	BULK CARRIER ORE STRENGTHENED	2	0	52000	03	40
ROYAL MARITIME CORP.	UK	KANASASHI CO.	JAPAN	BULK CARRIER ORE STRENGTHENED	1	0	52000	03	0
KAWASAKI KISEN KAISA (K-LINE)	JAPAN	KAWASAKI H.I.	JAPAN	BULK CARRIER ORE STRENGTHENED	1	0	180000	03	0
JAPANESE INTERESTS	JAPAN	MTSUI	JAPAN	BULK CARRIER ORE STRENGTHENED	1	0	177000	02	0
GOLDEN UNION	GREECE	TSUNESHI	JAPAN	BULK CARRIER ORE STRENGTHENED	1	0	76300	01	20.5
IUM SHIPMANAGEMENT	NORWAY	TSUNESHI	JAPAN	BULK CARRIER ORE STRENGTHENED	1	0	106000	02	40
DOCKWISE	BELGIUM	HYUNDAI MIPO	KOREA	CABLE SHIP	1	0	12500	01	0
TYCOM	US	KEPPEL HITACHI	SINGAPORE	CABLE SHIP	4	0	7800	02	160
IMC HOLDINGS	SINGAPORE	DAUANNEW	CHINA	CHEMICAL TANKER	1	0	45000	503	32.13
WAWASAN SHIPPING	MALAYSW	DAUANNEW	CHINA	CHEMICAL TANKER	1	0	44800	03	0
GERMAN TANKER CO	GERMANY	UNDENAU	GERMANY	CHEMICAL TANKER	1	0	31600	01	0
UNKNOWN	UNKNOWN	UNDENAU	GERMANY	CHEMICAL TANKER	1	0	31600	02	0
D'AMATO DI NAVIGAZIONE	ITALY	SHIN-A SHIPBUILDING	KOREA	CHEMICAL TANKER	2	0	37000	03	47.6
MARINE SERVICES GROUP	GERMANY	SHIN-A SHIPBUILDING	KOREA	CHEMICAL TANKER	1	0	37000	03	0
REEDEREI NORD KLAUS E. OLDENDORFF	CYPRUS	AKER MTW WERFT	GERMANY	CONTAINER	4	2466	34000	03	114.8
NEPTUNE ORIENT LINES (NOL)	SINGAPORE	ATLANTIS	SINGAPORE	CONTAINER	1	1000	0	02	0
REEDEREI NORD KLAUS E. OLDENDORFF	CYPRUS	CHINA SHANGHAI	CHINA	CONTAINER	4	2500	0	03	114.8
CP SHIPS	US	CHINA SHIPBUILDING CORP.	TAIWAN	CONTAINER	5	3200	0	02/03	185
ELF SHIPPING	MALTA	DAEDONG SHIPBUILDING	KOREA	CONTAINER	1	2520	0	03	30
RENSBURG S.	GERMANY	GDYNIA	POLAND	CONTAINER	1	2650	0	302	33
RICKMERS	GERMANY	GDYNIA	POLAND	CONTAINER	2	4370	0	04	90
LEONHARDT & BLUMBERG	GERMANY	GUANGZHOU	CHINA	CONTAINER	1	1740	0	03	0
CGM	FRANCE	HANJIN	KOREA	CONTAINER	2	4350	0	02	106
HANJIN SHIPPING CO.	KOREA	HANJIN	KOREA	CONTAINER	2	4350	0	02	105.5
CHINA SHIPPING GROUP (CSG)	CHINA	HUDONG SHIPYARD	CHINA	CONTAINER	5	4050	0	03/04	250
OCEAN SHIPPING	SWITZERLAND	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	CONTAINER	2	2600	0	02	0
AHRENKIEL	GERMANY	HYUNDAI MIPO	KOREA	CONTAINER	2	2770	0	03	32.5
NEPTUNE ORIENT LINES (NOL)	SINGAPORE	IMABARI SHIPBUILDING	JAPAN	CONTAINER	2	5500	0	03	0
A. P. MOLLER	DENMARK	11 SIETAS	GERMANY	CONTAINER	4	1700	0	01	0
PACIFIC CARRIERS	SINGAPORE	JING JIANG	CHINA	CONTAINER	4	520	0	01/02	36
ISLAMIC REPUBLIC OF IRAN SHIPPING LINES (IRSL)	IRAN	KHALUJE FARIS SHIPBUILDING COMPLEX	IRAN	CONTAINER	6	2200	0	02	188
NEPTUNE ORIENT LINES (NOL)	SINGAPORE	KOYO DOCK	JAPAN	CONTAINER	2	5500	0	03	0
OFER BROS	ISRAEL	SAMSUNG	KOREA	CONTAINER	3	4050	0	03	0
ORIENT OVERSEAS CONTAINER LINE - OOCL	CHINA	SAMSUNG	KOREA	CONTAINER	2	7400	0	03	160
SEASPAN INTER.	CANADA	SAMSUNG	KOREA	CONTAINER	3	4050	0	03	0
CHINESE INTERESTS	CHINA	SHANGHAI EDWARD	CHINA	CONTAINER	2	1200	0	02	0
RIMORCHIATORI RIUNTI	ITALY	THYSSEN NORDSEEWERKE	GERMANY	CONTAINER	1	2476	0	02	0
RICKMERS	GERMANY	ZHONGHUA SHIPYARD	CHINA	CONTAINER	2	1200	0	02	0
CRYSTAL CRUISES	US	CHANTERS DE L'ATLANTIQUE	FRANCE	CRUISE SHIP	1	0	0	03	350
SRI LANKA PORTS AUTHORITY	SRI LANKA	IHC HOLLAND	NETHERLANDS	DREDGER	1	0	2000	01	0
CHENNAI PORT TRUST	CHINA	COCHIN SHIPYARD	INDIA	DREDGER SUCTION HOPPER	1	0	2000	02	11.3
DREDGING INTERN. & DECLOEDT	CHINA	IHC HOUAND	NETHERLANDS	DREDGER SUCTION HOPPER	1	0	10650	02	0
RUSSIAN INTEREST	RUSSIA	VISSEROFDENHELDER	NETHERLANDS	FISHING	1	0	0	01	0
AUANCA HAMBURG	GERMANY	KLEVEN FLORO	NORWAY	FRUIT JUICE TANKER	1	0	42000	03	58
JAPANESE INTERESTS	JAPAN	HIGAKIZOSEN	JAPAN	GENERAL CARGO	2	0	11300	01	0
AMASUS	NETHERLANDS	PETERS SCHEEPSWERF	NETHERLANDS	GENERAL CARGO	2	0	1700	01	0
UNKNOWN	UNKNOWN	GHING SHAN SHIPYARD	CHINA	GENERAL CARGO	2	0	6750	01	0
SCOT LINE	UK	TILLE SCHEEPSBOUW	NETHERLANDS	GENERAL CARGO	2	170	3300	01/02	0
JUMBO SHIPPING	NETHERLANDS	DAMEN SHIPYARDS	NETHERLANDS	HEAVY/LIFT CARGO	2	0	0	02	105.5
BERGESEN	NORWAY	DAEWOO	KOREA	LNG	1	0	0	03	155
NIGERIAN NAT PETROLEUM	NIGERIA	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	LNG	1	0	77000	03	160
TOKYO ELECTRIC POWER	JAPAN	MITSUBISHI H.I.	JAPAN	LNG	1	0	0	03	180
MONTANARI GROUP	ITALY	CANTIERE NAVA1E DI PESARO	ITALY	L-G	2	0	11000	02/03	53.9
GEOGAS TRADING	SWITZERLAND	DAEWOO	KOREA	LPG	1	0	30000	1102	42
ARMAWA SHIPPING & TRADING	SWEDEN	DAMEN SHIPYARDS	NETHERLANDS	MULTIPURPOSE	2	0	3800	01	0
CARSBROOKE SHIPPING	UK	GALATZ	ROMANIA	MULTIPURPOSE	2	1100	0	02	0
US INTERESTS	US	GLADDING- HEARN SHIPBUILDING	US	PASSFERRY	2	0	0	01	0
ISLAMIC REPUBLIC OF IRAN SHIPPING LINES (IRSL)	IRAN	KHALUJE FARIS SHIPBUILDING COMPLEX	IRAN	PASSENGER	2	0	0	02	13
PAN ADRIATIC	SWITZERLAND	UJANIK	CROATIA	PASSENGER / RO-RO	2	0	0	02	139
STRINTZIS LINES	GREECE	DAEWOO	KOREA	PASSENGER / VEHICLE FERRY	2	0	0	02	120
PORTOSALVO LTD	UK	AKER TULCEA	ROMANIA	PLATFORM SUPPLY VESSEL	1	0	0	202	15.1
SIMON MCKSTER SHIPPING	NORWAY	ALUKRAINDUSTRIER	NORWAY	PLATFORM SUPPLY VESSEL	1	0	0	02	24.7
GULF OFFSHORE NS	UK	BRATTVAAG	NORWAY	PLATFORM SUPPLY VESSEL	1	0	0	02	15.1
INTERNATIONAL OFFSHORE SERVICES	AUSTRALIA	BREUK MARINE	NORWAY	PLATFORM SUPPLY VESSEL	1	0	0	302	20
D'AMICO	ITALY	DAEDONG SHIPBUILDING	KOREA	PRODUCTS TANKER	1	0	35000	02	24
TORMA/S	DENMARK	DAEDONG SHIPBUILDING	KOREA	PRODUCTS TANKER	2	0	45000	02	56
A. P. MOLLER	DENMARK	DAUANNEW	CHINA	PRODUCTS TANKER	1	0	110000	03	40
CHINA SHIPPING GROUP (CSG)	CHINA	GUANGZHOU	CHINA	PRODUCTS TANKER	4	0	46000	03/04	0
SOCRATA	CHINA	HAEDONG	KOREA	PRODUCTS TANKER	2	0	7500	01	0
TORMA/S	DENMARK	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	PRODUCTS TANKER	1	0	99900	03	39.9
TORMA/S	DENMARK	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	PRODUCTS TANKER	1	0	99900	02	39.9
ADMANTOS	GREECE	HYUNDAI MIPO	KOREA	PRODUCTS TANKER	2	0	46000	03	56
BAKRI	SAUDI ARABIA	HYUNDAI MIPO	KOREA	PRODUCTS TANKER	2	0	35000	03	0
GEDEN LINE	TURKEY	HYUNDAI MIPO	KOREA	PRODUCTS TANKER	2	0	37000	03	48
SOLAR SHIPPING [NYK]	JAPAN	SHIN KURUSHIMA	JAPAN	PRODUCTS TANKER	1	0	46000	902	30
CHEMIKALJEN SEETRANSPORT (CST)	GERMANY	SHIN-A SHIPBUILDING	KOREA	PRODUCTS TANKER	1	0	37000	03	26.5
EIDESVIK & CO.	NORWAY	MJELLEM & KARLSEN	NORWAY	SESMIC	1	0	0	02	0
NAV10N	NORWAY	SAMSUNG	KOREA	SHUTTLE TANKER	2	0	126000	03	140
GULFMARK OFFSHORE	US	AKER BRATTVAAG	NORWAY	SUPPORT VESSEL	4	0	0	02/03	0
HELLESPONT	GREECE	DAEWOO	KOREA	TANKER	1	0	442500	03	90
WORLD-WIDE SHIPPING	BERMUDA	DAEWOO	KOREA	TANKER	1	0	300000	03	75
ARAB MARITIME PETROLIUM	EGYPT	HYUNDAI HEAVY INDUSTRIES (HHI)	KOREA	TANKER	1	0	153000	03	0
MOSVOLD FARISUND	NORWAY	SAMSUNG	KOREA	TANKER	1	0	308000	1103	74.1
STEALTH MARITIME	NORWAY	SUMITOMO	JAPAN	TANKER	1	0	105000	03	0
VAUES STEAMSHIP CO	CANADA	TSUNESHI	JAPAN	TANKER	2	0	106300	02/03	79
ABU DHABI SEA PORT AUTHORITY	UAE	KEPPEL HITACHI	SINGAPORE	TUG	2	0	0	01	10

## Low-Cost Training For STCW Compliance

PC Maritime offers a new suite of engineering training product developed to meet STCW 95 Sections A-1/12 and B-1/12, and ISM Code Sections 6 and 8. The PC-based products are designed to deliver effective training at low cost, and to provide the tools to assess and document the competence of personnel. The programs are self-installing and designed to be easy to use in Windows 95/98/NT environments. The range covers basic cadet training up to mini full-mission engine room simulation.

Circle 39 on Reader Service Card

## CMR Extends Expertise To U.S.

CMR Schroeder LLC has joined CMR, an international group of compa-

nies based in France and known for its expertise in instrumentation and engine controls.

CMR Schroeder LLC is now the design, sales, manufacturing and service location for CMR in North and South America. Since 1959, CMR has been a leader in the design and manufacture of sensors, pre-engineered conduit, monitoring, alarm and control systems for the marine industry.

CMR has designed a range of state-of-the-art products, including sensors for measuring exhaust gas, combustion, bearing and fluid temperature; integrated, bolt-on, purpose-engineered conduit/cable systems; local and remote instrument and control panels; digital and analog alarms; and microprocessor-based control systems.

Circle 46 on Reader Service Card

## Steerprop Offers Azimuth Propulsors

Steerprop Ltd. began operation in September 2000, and is a company created to market, sell, design, engineer, supply, and service azimuth propulsion units globally, for maritime as well as offshore oil and gas industries.

The strategic objective of the company is to develop a superior life cycle economy and availability of azimuth propulsors. The design and engineering team engaged in the task has obtained the necessary skills and expertise during a long service in the azimuth propulsor industry.

The team has expertise in mechanical and electric engineering, electronics, naval architecture and hydrodynamics. It offers a product with a power range from 800 kW to 6000 kW and propeller

diameters from 1.5 to 4.5 meters.

Circle 44 on Reader Service Card

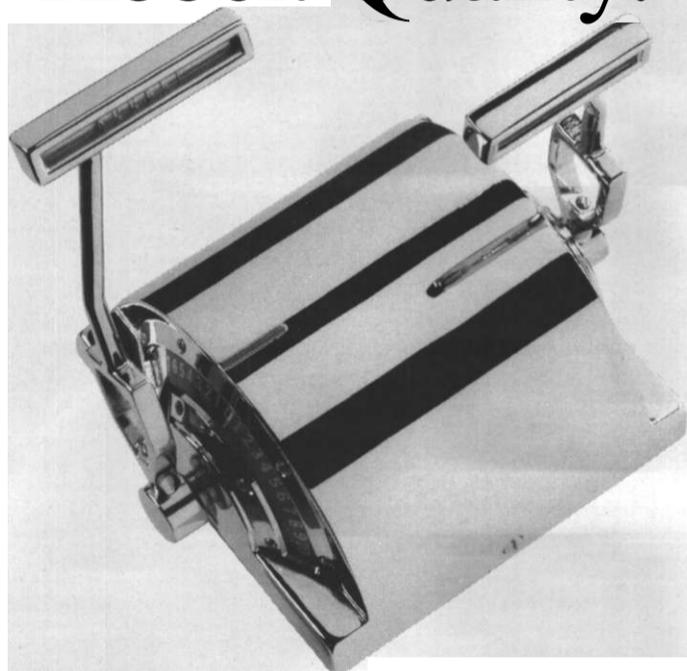
## JRC IBS Displayed At Workboat

JRC displayed a full-integrated bridge system at the Fish Expo/Workboat Northwest Show in Seattle and at the Workboat Show in New Orleans this past December. The company also plans to present the system at the Miami Boat Show in February.

The systems include radar/ARPA, ECDIS and IRCS systems, designed to provide centralized information management, target tracking, navigation, communications, collision avoidance and grounding prevention. JRC is also exhibiting a full range of electronic products for workboats and fishing vessels.

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## Boatrac's Launches VComm IP

While not monitoring and control per se, the new Mini-M Optimizer, VComm IP from Boatrac's — a business unit of Advanced Remote Communication Solutions — is designed to enable boat owners and operators as never before. Launched in early December in New Orleans, the VComm IP suite of communication and position-reporting software, along with Boatrac's 24/7/365 Network Operations Center, automates and manages data queuing and scheduling, transmission and provides fleet tracking information for the maritime fleet operator via the internet. The new package consists of three components: VComm IP Vessel, VComm IP Office and VComm IP Server. The first two are installed on a customer's vessel and in the customer's home office, respectively. The third component operators in Boatrac's NOC and provides overall system control and management. In essence, the new system helps users to optimize their Mini-M usage by providing the ability to automatically transmit data as well as message and send vessel position information to the home office. "The major advantage of VComm IP is its unique ability to reduce the cost of sending data files," said Charles J. Drobny, Jr., COO of Boatrac's. "VComm IP allows users to make the most of available bandwidth by transforming Mini-M into a store-and-forward message and file transfer medium."

Boatrac's is partnering with Station 12 to deliver airtime service to its customers that operate fleets internationally.

Circle 197 on Reader Service Card

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Maritime Reporter & Engineering News

' M H f f I H n H R r

### Litton European Unit Advances

#### IB Concept For Workboats

While the advent and advantages of an integrated bridge are more closely associated with big ships and the blue water market, Litton Marine Systems has developed and is offering a comprehensive bridge designed for installation on river dwelling vessels. In fact, the manufacturer recently announced that its MasterLine series of river products have been type approved for the European inland shipping market.

The type approval certificates were issued by Dijkstra Advies Research & EMC Consultancy BV, under EMC directive 89/336/EEC. The products were tested and found in compliance with the provisions of EN60945 (1997) Clause 9 and 10 EMC.

The new MasterLine series is a suite of river radars, autopilots, indicators, gauges, wind instruments, electronic magnetic compass, depth sounder, intercom, closed circuit TV and touch-screen engine and ship control displays. The suite of products has been designed specifically to meet the unique requirements of the river environment,

with shallow waters and narrow, winding rivers and channels. The individual products can be sold separately, or as part of a fully integrated system, built into a custom-designed console.

The MasterLine series has been developed by Litton Marine Systems BV Holland, Litton's primary technology center for river products. The group was formed from the combination of International Navigation Aids (INA) and Sperry Holland.

Circle 42 on Reader Service Card

### Beier Radio Introduces New Position

#### Reference System

Beier Radio has introduced its RS2000 Reference System for vessels. The system calculates vessel position to within one meter accuracy, typically plus or minus one foot. It was designed for vessels that need precise position information when the vessel cannot receive normal DGPS signals.

It can also be used to provide precise position information for vessels that need to hold position for extended periods, and is also able to pinpoint

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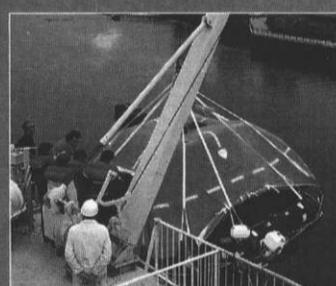
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Circle 255 on Reader Service Card

# Statistics

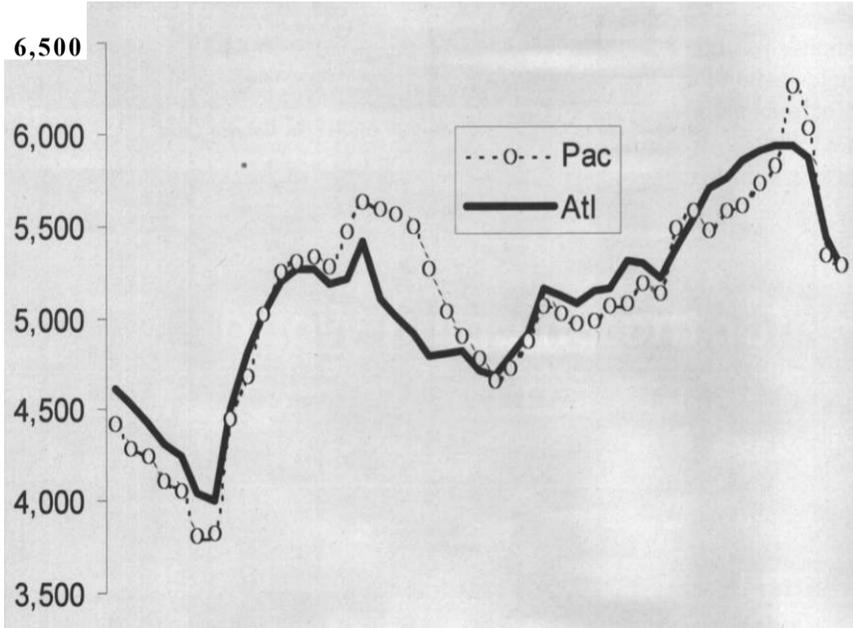
The year 2000 in shipping ended on a down note, but taken as a whole, the industry recorded strong results over 1999. Freight rates in both the dry bulk and oil sectors logged strong 12-month gains, but nagging concerns regarding the future direction of oil prices and the threat of slowing economies, particularly in the United States, have led many to temper 2001 projections with a note of caution. The following data and statistics provide a snapshot of the market as of December 22, 2000. To receive information, insight and analysis on a daily basis, visit [www.maritimetoday.com](http://www.maritimetoday.com) and sign up for FREE daily news updates delivered via e-mail, tailored to your specific information requests.

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## Dry Bulk: Weak Finish, but Strong Year

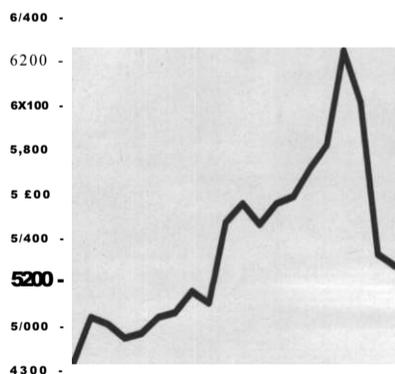
Although SS&Y's Pacific and Atlantic Capesize indicies staggered to the finish line, both ended (on December 21, 2000) up significantly. The Pacific Capesize index was up nearly 20%, from 4,418 on Dec. 20, 1999 to 5,284 on Dec. 21, 2000; the Atlantic Capesize index was up more than 14%, from 4,619 to 5,266.

### 1-Year Results

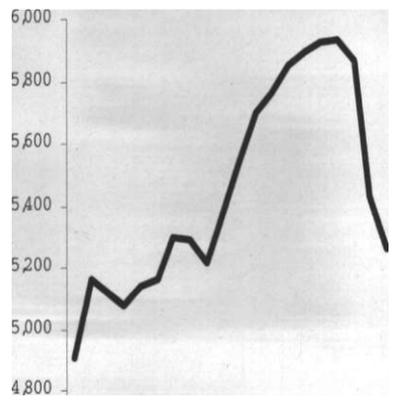


### 3-Month Results

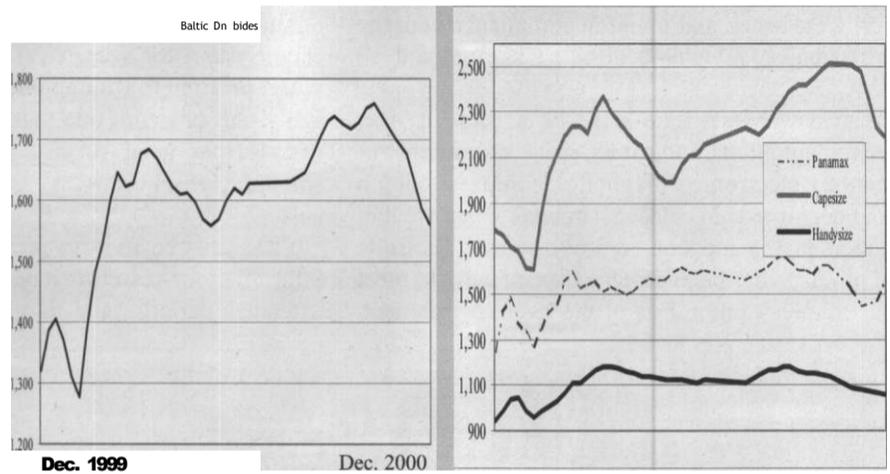
3 Months: Pacific Capesize Index



3-Months: Atlantic Capesize Index



## Baltic Index Ends Year On Down Note



### Shipsales: Nov. 20 - Dec. 20, 2000

Type	Name	YB	DWT	\$	Type	Name	YB	DWT	\$
Bulker	Good Luck	1986	200,692	\$16.90	Container Vessel	Elise Schulte	1992	17,610	13.0
Bulker	Sea Fin	1984	64,897	\$4.30	Container Vessel	Auguste Schulte	1991	17,610	13.0
Fixed on live year charter to Total at approximately \$22,000-23,000 daily.									
Bulker	Doryforos	1972	32,785	\$187.25/ldt	Container Vessel	Johanna	1982	11,804	3.0
Bulker	Ansaie Prosperity	1986	25,000	\$5.85	Container Vessel	Savannah	1984	14,021	5.0
Bulker	Anangel Endeavour	1978	23,200	n/a	Container Vessel	China Pioneer	1985	12,573	3.5
Bulker	Pacific Orient	1984	67,478	\$7.50	Container Vessel	Mint Arrow	1996	5,280	6.7
Bulker	Rostia	1984	42,972	17	RoRo	Seaboard Costa Rica	1984	14,454	\$15 en-bloc
Bulker	Haralambos	1976	112,731	\$184.25/ldt	RoRo	Seaboard Panama II	1983	14,454	\$15 en-bloc
Bulker	Tropic Confidence	1986	17,832	\$4.90	RoRo	Tropic Quest	1983	9,989	\$8 en bloc
Bulker	Pretty Prosperity	1997	47,051	22.0	RoRo	Tropic Reign	1984	9,989	\$8 en bloc
Bulker	Corrin	1979	24,175	2.0	Sellers believed to be retaining the vessel's management.				
Bulker	Ghikas	1980	17,168	1.8	Tanker	Ina	1972	28,769	\$178/ldt
Bulker	Lantau Peak	1978	115,754	\$127/ldt	Tanker	Geyve	1969	21,442	£ 182/ldt
Bulker	Zetland	1985	145,905	13.0	Tanker	Olympic Venture	1996	44,128	\$24.30
Bulker	Belstar 1	1992	43,419	13.5	Tanker	Avior	1970	6,000	\$1
Bulker	Garland	1986	179,802	\$15.2-15.3	Tanker	Michael	1977	132,478	\$145/ldt
Bulker	Western Rams	1983	45,575	\$6.3-6.4	Tanker	Exeter	1978	132,284	\$8.20
Bulker	Blossom Forever	1992	38,852	12.5	Tanker	Seapremis 11	1975	28,527	\$187.25/ldt
Bulker	Secbee	1987	37,986	7.1	Tanker	Navix Seibu	1989	257,589	34.0
Bulker	Sun Phoenix	1986	27,367	5.7	Tanker	Front Birch	1991	149,500	38.0
Bulker	Hakufu	1987	26,682	6.8	Tanker	Lochness	1993	89,319	\$36
Bulker	Hang Fu	1977	21,496	IA	Tanker	Glenross	1993	89,249	36.0
Bulker	Taipan 1	1977	28,092	1.7	Tanker	Bitten Theresa	1999	5,650	11.5
Bulker	Kocaeli 1	1973	22,249	162.0	Tanker	Panagia Soumela (built 1975)	1975	31,016	\$ 152/ldt
Bulker	Yasmina	1970	13,738	166.0	Tanker	Cielo Di Salerno (built 1974)	1974	26,920	\$190/ldt
Bulker	Adamas	1978	22,823	2.1	Tanker	LatoM	1981	86,408	\$7.25-7.5
Bulker	Yohfu	1987	26,712	7.0	Tanker	Capella Gas	1992	1,601	4.0
Bulker	Yusuf Kalkavan	1977	27,305	1.7	Tanker	Coastal New York	1956	39,356	186.0
Bulker	Sun Phoenix	1986	27,367	5.8	Tanker	Loucas	1986	83,970	13.0
Bulker	Achilles	1978	28,973	22	Tanker	Yugawasan	1993	69,998	19.0
Bulker	Pakarti Raya	1984	29,111	5.0	Tanker	Petrobulk Runner	1988	29,998	12.5
Bulker	Griffin Aurora	1984	30,650	5.7	Tanker	Agip Liguria	1984	113,900	11.9
Bulker	Blossom Forever	1992	38,852	12.5	Tanker	Agip Piemonte	1987	113,900	14.8
Bulker	Konamar	1991	42,226	12.5	Tanker	Atlantia	1979	97,104	8.5
Bulker	Rostia	1984	42,972	7.9	Tanker	Tromas	1988	96,400	21.0
Bulker	Western Rams	1983	45,575	6.4	Tanker	Sun	1993	29,815	12.0
Bulker	Sea Fin	1984	64,854	4.5	Tanker	A! Nabila 3	1973	30,328	174.0
Bulker	Pacific Orient	1984	67,478	7.5	Tanker	Sun	1993	29,800	12.0
Bulker	Prime Condition	1988	68,600	10.0	Tanker	Seapromise	1976	32,093	2.0
Bulker	Peoria	1996	70,231	18.5	Tanker	Dignity	1992	41,461	20.0
Bulker	Paiute	1995	70,293	17.5	Tanker	Olympic Venture	1996	44,128	24.0
Bulker	Oinoussian Leader	1997	71,694	18.0	Tanker	Maersk Martin	1990	69,999	19.0
Bulker	Pearl of Dubai	2000	75,484	23.0	Tanker	BandaSea	1996	94,000	40.0
Bulker	St-cergue	1983	75,485	6S	Tanker	Atlantia	1979	96,920	8.5
Bulker	Hyundai Pacific	1981	128,150	7.0	Tanker	Torm Gudrun	2000	99,600	48.0
Bulker	Saikyo	1993	149,475	23.0	Tanker	Maersk Visual	1988	110,361	24.5
Bulker	Ken Kon	1990	151,380	m	Tanker	Exeter	1978	132,285	8.0
Bulker	Magellan Maru	1986	171,931	14.8	Tweendecker	Panormos Wind	1977	15,895	\$1.25
Bulker	Garland	1986	179,802	15.0	Tweendecker	Sin Tong	1971	16,919	\$166/ldt
Bulker	Chiribetsu	1986	200,692	17.0	Tweendecker	Fulvia	1973	14,600	\$181/ldt

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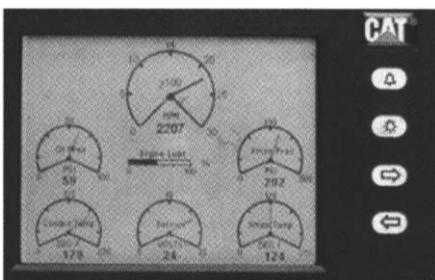
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## Monitoring & Cont

entrances of remote harbors, rivers and docks. The RS2000 is designed to do basically what the USCG Differential GPS transmitters do. It provides a correction for the GPS signal in areas not covered by the existing Differential network. The RS2000 receives the GPS signal and makes corrections for its actual location. The corrected data is forwarded to the vessel. Two models are available, for either short or long range position fixing. The short range model is good for distances of up to 3 miles, is low power and requires no licensing. The long-range version is capable of much longer distances.

Circle 199 on Reader Service Card

### Cat Engines Boast Improved Monitoring Capabilities



A new electronic engine monitoring system from Caterpillar is designed to improve monitoring capabilities and add customization features previously unavailable on single-engine systems. The Cat digital Marine Power Display (MPD) is a self-contained engine and transmission monitoring and display system compatible with Cat electronically controlled engines in the 3412E and smaller size ranges. Its compact size and simple wiring requirements make it easy to install. A high-resolution 320 x 240 dpi image, combined with transfective screen technology is designed to provide good readability in all light conditions.

Circle 45 on Reader Service Card

### Commodore Holdings Files For Bankruptcy

Cruise company Commodore Holdings Ltd. filed for Chapter 11 bankruptcy reorganization in late December, and said it would suspend operation of its three ships after returning passengers to their ports of embarkation. The Hollywood, Florida-based company said it was unable to negotiate an agreement with its mortgage lenders in time to avoid canceling cruises. According to Hoover's company profiles, the 34-year-old company employs 1,300 and had 1999 sales of \$61.5 million

### Frontline, OSG Buy Two VLCCs

Frontline and its partner Overseas

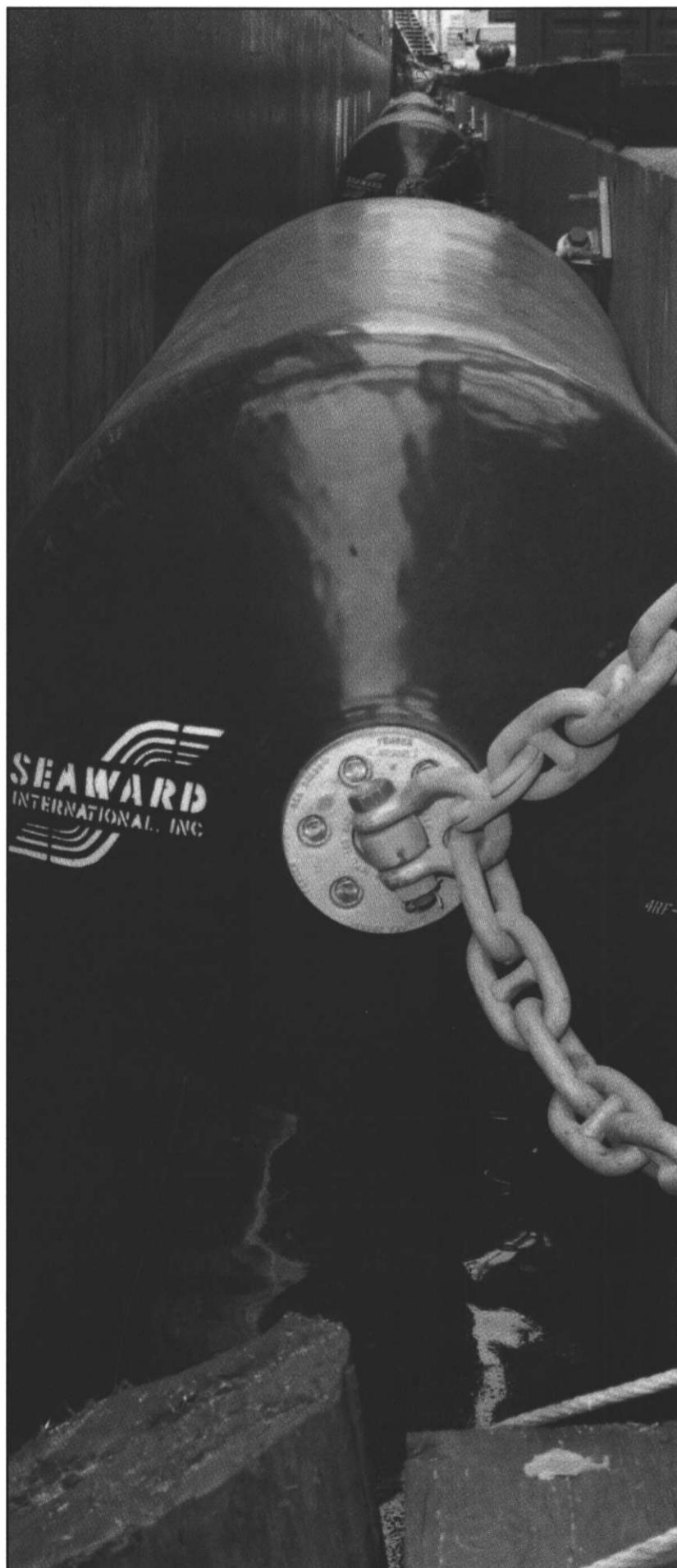
Shipholding Group (OSG) signed a deal to buy VLCCs from Osprey Maritime Ltd., for \$53 million each. Frontline said that it and OSG would own the Golar Edinburgh and Golar Dundee VLCCs via a joint venture company to be owned 51 percent by Frontline and 49 percent by OSG. The 302,500-dwt, 1993-built, double-sided vessels are

scheduled for delivery in the first quarter of 2001.

### USCG Restricts Barge Tow Size

The U.S. Coast Guard further restricted the size of barge tows on the Mississippi River due to problems with low water levels that have caused several

groundings late in 2000. It said, effective immediately, barge tows traveling from Cairo, Illinois, to St. Louis, Missouri, were limited to no more than 15 barges, loaded or unloaded, due to continued low water levels. Two weeks prior the Coast Guard established a 180-mile long safety zone on the Mississippi River between the two cities.



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Grandall Dry Dock Engineers Inc., P.O. B. 50580A, MA 02150  
Washington Chain Inc., Box 3645, Seattle, WA 98124

**ASSOCIATION**  
Marine Machinery Assoc., 2300 Clarendon Blvd., Arlington, VA 2201

**AUTOMATED SELF UNLOADING**  
Seabulk Systems Inc., Suite 200, 3751 Shell Road, Richmond, British Columbia, CANADA V6X2W2

**AUTOPILOT SYSTEMS**  
Mackey Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851  
ComNav Marine, 1915 Stearns Bay, Vancouver, B.C. CANADA  
Raytheon Marine Co., 22 Cotton Rd., Nashua NH 03069

**BAKING MACHINE**  
Eika Record Inc., 20 Vanderhoof Ave. Suit 2, Rockaway, NJ 07866

**BALLAST**  
Ballast Technologies, 4620 S. Coach Dr., 85714, Tucson, AZ  
Redard Genstar Inc., Executive Plaza IV, Hunt Valley, MD 10912-1031  
**BEARING—Rubber, Metallic, Non-Metallic**  
Kahlerberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Ohol Inc., 2535 Prairie Rd., Unit D, Eugene, OR 97402  
Thoron Bearings Inc., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6  
Vesco Plastics, P.O. B. 40647, Cleveland 2022 SOUTH AFRICA

**BLOCKS & RIGGING**  
Stokum, P.O. Box 290, Hubbard, OR 97032

**BOATBUILDER**  
Kvaerner Masa Marine, 1525 W. 8th Ave, Vancouver B.C. Canada V6J1H5  
Kichak Marine, 469 NW Bowdoin Pl, Seattle, WA 98107  
Washington Doughty, P.O. Box 276, EBoothbay ME 04544

Captain Astal Company, Inc., P.O. Box 350486, Ft. Lauderdale, a 33335  
Marcon International, Inc., P.O. Box 1170, Coupenote, VA 8239-1170  
Mowbray's Tug & Barge Sales Cap., 35 De Hart St, Morristown NJ 07860

**BULKHEAD SEALS/PANELS**  
CSD North America, 880 Canada Rd, Unit 10, Manchester, NH 03109  
Themas, 15006 Shaw Rd, Tampa, a 33625-6500  
Themas 3115 Range Rd Temple, TX 76501

**BUOYS**  
Datex, P.O. Box 1150, Kinder, LA 70648

**CABLE TRANSIT SYSTEMS**  
CSD North America, 880 Canada Rd, Unit 10, Manchester, NH 03109

**CALIBRATIONS**  
Standard Calibrations Inc., 908 A Ventures Way, Chesapeake VA 23320

**CAD/CAM SYSTEMS**  
Albacore Research, 4196 Keston Place, Victoria, B.C. Canada V8X4L7  
Autoship Systems Corp., #403, 611 Alexander St. Vancouver, B.C. Canada V6A1E6  
Creative Systems, Inc., P.O. B. 1910, Port Townsend WA 98368  
HMSA 13 Jenkins Court, Suite 200, Duluth, MN 03894

**Cockburn Computer Systems AB, PO Box 50565, S-2022 15 Malmo SWEDEN**  
P.T.C., 128 Tech Drive, Wallingford MA 02543  
Scientific Marine Services, Inc., 101 State Pl, Suite F, Escondido, CA 92029  
Ship Motion Associates, 10 Danforth St, Portland, ME 04101-4567

**CAP TREADS**  
Washington Aluminum, 1330 Knecht Ave, Baltimore, MD 21229

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

**CARGO MONITORING A CONTROL SYSTEM**  
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017  
Hermite Inc., 4522 Center St, Deepark TX 77536

**CAST IRON REPAIR**  
Metal Surgery, 2901 W Mill Road, Milwaukee, WI 53209  
InPlace Machining 1929 N. Bullum St. Milwaukee, WI 53212

**CHAINS**  
New England Marine & Industrial, 200 Spaulding Turnpike, Portsmouth, NH 03801  
Washington Chain, P.O. Box 3645, Seattle, Wa. 98124

**CLUTCHES**  
Haley Dutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702

**CHC PLATE CUTTING**  
Advanced Fabricating Inc PO Box 3721 Galveston, TX 77552

**COATINGS / CORROSION CONTROL / PAINT**  
American Safety Technologies 565 Eagle Rock Ave Roland NJ 07068  
Arker Marine Paints, 21 Christie Street, Westport, CT 06880  
AquaDyne, 3620 W. 11th St., Houston, TX 77008  
21st Century Coatings Inc., 4701 Wilard Ave #109, Chevy Chase, MD 20015  
Brite Products, 14650 Dequindre, Detroit, MI 48212  
Jolan Paints Inc., 1401 Sevan a, Baltimore MD 21230

**Eureka Chemical Co., 234 Lawrence Ave, South San Francisco, CA 94080**  
Corrosal Inc., 70 E. Sunset Way, 1251, Issaquah, WA 98027  
Flow International Corp., 23500 64th Ave. North Kent, WA 98032  
Mascoat Products, 3500 E. T.C. Jester, Suite N, Houston, TX 77018  
Nace Intl., 1440 South Creek Dr., Houston, TX 77084  
NoFile Technologies, 21 Industrial Ave, Upper Saddle River, NJ 07468  
Eggard, Inc., P.O. Drawer 2698, Lafayette, LA 70502  
Fero Corp., 1301 North Flora St., Plymouth, MI 48563  
Jamestown Distrib., P.O. Box 348, Jamestown, RI 02835  
Chesapeake Specialties Products, 5055 North Points Blvd, Baltimore Md 21219  
Wesser High Tech Coatings, 8041 South 228th St, Kent, WA 98032

**COMMUNICATIONS SERVICE**  
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Maritime Telecommunications Networks, Inc., 8400 NW 52nd St, Suite 110, Miami, a 33166  
Maritel Marine Communications, 16 E. 41st St. NY, NY 1X17  
Corast Maritime Services, 6500 Rock Spring Drive, Bethesda, MD 20817-4146  
Radio Holland, 8943 Gulf Freeway, Houston, Texas 77017

**COMPOSITES PROCESSING**  
Composite Technology Consultants, Inc. 12310 Northwinder Row,  
Bayonet Point, Fla. 34667  
Midtech Composites Inc., 40 Strawberry Hill Rd, Hillsdale, NJ 07642

**COMPOUNDS**  
ITW Philadelphia Resins, 130 Commerce Dr. Montgomeryville, PA 18936

**COMPRESSOR PARTS**  
CMP Corporation, P.O. Box 45199, Oklahoma City, OK 73155

**COMPUTER / COMPUTER SOFTWARE**  
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Fleet Technology, 311 Leggett Dr, Karata, Ontario, Canada K2K 1Z8  
MIL Systems, 2004150 Morrison Drive, Ottawa, Ontario K2H 8S9  
Sener, C/Severo Ochoa, 4 Parque Tecnológico de Madrid,

28760 Tres Cantos - Madrid SPAIN  
Uoyris Register, 100 Leadenhall St, London, England EC3A 3BP  
Ship Motion Associates, 10 Danforth St, Portland, ME 04101  
Azorix Corp, 900 Middlesex Tpke, Billerica, MA 01821  
Spar Associates, 927 West St., Annapolis, MD 21401  
Creative Systems, Inc., P.O. B. 1910, Port Townsend, WA 98368

**COMMUNICATIONS**  
Hose McCann 1241 W. Newport Center Deerfield Beach, FLA 33442  
Mackey Comm Inc 2721 Discovery Dr Raleigh NC 27616-1851

**COMPUTER SOFTWARE SYSTEMS**  
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Protus Engineering 345 Pier One Rd Stevensville, MD 21666

**CONSULTANTS**  
Hornblower Marine, Pier 3 Ferryboat Santa Rosa, San Francisco, CA 94111  
**CONSOLE - GMDSS**  
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Mackey Communications, 2721 Discovery Dr, Raleigh, N.C. 27616-1851  
Raytheon Marine Co., 22 Cotton Rd, Nashua NH 03069

**CONTROL SYSTEM - Monitoring/Steering**  
Governor Control Systems, 3190 S.W. 4th Ave, Ft Lauderdale, a 33315  
Motor Services Hugo Stamp, 3190 S.W. Lauderdale, a 33315  
MMC International, 60 Inip Dr, Inwood NY 11095  
Raytheon Marine Co., 22 Cotton Rd, Nashua NH 03069

**Scientific Marine Services, Inc., 101 State Pl, Suite N, Escondido, CA 92029**  
Stok Kwant, P.O. Box 23, 8600 AA Sneek, Netherlands  
Kobak Mfg Co, Ltd, 8238-129 St, Sunny, B.C. V3W0A6  
Electronic Marine Systems, 800 Fennell Pl, Railway, NJ, 07065  
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kennet, LA 70068

**CORROSION CONTROL**  
Gardner Denver Water Jetting Systems 8807 Emmett Rd. Suite 100 Houston, TX 77040

**COUPLINGS**  
American Vulcan, 2525 Dundee Rd, Winter Haven - a 33884  
Mapco Products, 91 Wentbrook Rd, Unit B, Oxford, CT 06478  
Canta Corp, 815 Blackhawk Dr, Westmont IL 60559  
Lo-Rez Vibration Control, Ltd, 185 West 8th Ave, Vancouver, B.C. V5Y 1N2  
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MVC Int. 60 Inip Drive, Inwood, NY 11095

**Crane--HOIST--DERRICK--WHIR LEYS**  
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Beso Marine Co., P.O. Box 4113, New Orleans, LA 70178  
Holy Host Corp., P.O. Box 86, St. Clair Shores, MI 48060-0086  
Edgewater Machine 1 Fabricators, P.O. Box 356, Edgewater, a 32132-0358  
Westmont Industries, 10805 Painter Ave, Santa Fe Springs, CA 90670

**CRANKSHAFT DEFLECTION ANALYZER**  
FCS, Inc., 22 Main St, Cromwell, CT 06409  
Pisano Teknik AB Sweden, www.pisantechnik.com

**CRANKSHAFT GRINDING**  
Goltens - New York Corp, 180 Van Brunt St, Brooklyn, NY 11231

**CRANKSHAFT REPAIR**  
Goltens - New York Corp, 180 Van Brunt St, Brooklyn, NY 11231

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Cutting and Welding Machines  
Bog-Systems, Inc., 3001 W. Carson St., Pittsburgh, PA 15204

**CYLINDER LOAD ANALYZER**  
General Thermodynamics, 210 S. Meadow Rd, Plymouth, MA 02360

**DECKING A FLOORING**  
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**DECK MACHINERY - Cargo Handling Equipment**  
Stokum Inc, P.O. Box 280, Hubbard, OR 97032  
Intercontinental Engineering, P.O. Box 9055, Kansas City, MO 64168  
Edgewater Machine 1 Fabricators, P.O. Box 358, Edgewater, a 32132-0358  
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Reverse Osmosis of South Florida, 12301 SW. 133 Court, Miami, a 33186

**DESIGN CONSULTING**  
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**DIESEL ENGINE ANALYZER**  
Kiene Diesel, 325 South Fairbanks, Addison IL 60101  
FCS, Inc., 22 Main Street, Cromwell, CT 06409  
Harmot Marine Inc., 3528 Griffitt, St. Laurent Quebec Canada  
**DIESEL ENGINE - Spare Parts A Repair**  
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Harmot Marine Inc., 3528 Griffitt, St. Laurent Quebec Canada  
Industrial Estate, New Territories, HONG KONG  
Catalytic, Inc., Engine OH, P.O. Box 610, Moseville, IL 61552-0610  
Datsa Canada Inc., 4120 Galsand St, Montreal, Que. H3R 2A3  
Goltens - New York Corp., 180 Van Brunt St, Brooklyn, NY 11231  
Governor Control Systems, 3190 S.W. 4th Ave, Ft Lauderdale, a 33315  
MAN B&W Diesel AG, Stadthausstrasse 1, 886153 Augsburg 1, GERMANY  
MAN B&W Diesel AS, Teglvangsgade 41, DK-2450 Copenhagen SV, DENMARK  
MAN AquaDyne, 17 State St, New York, NY 10004  
Meriso USA, Inc., 100 Davidson Ave, Sommerset, RI 06873  
MotorService AB, Box 2115, S-144 04 Rominge, SWEDEN  
Motor Service-Hugo Stamp, 3190 S.W. 4th Ave, Ft Lauderdale, a 33315  
Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401  
Kiene Diesel, 325 South Fairbanks, Addison, IL 60101  
HPIInternational, Inc., 3812 W. Lindebaugh Ave, Tampa, FL 33624

**DIESEL ENGINE OVERHAUL**  
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Governor Controls Systems 3190 W. 4th Ave Ft Lauderdale FL 33315

**DIESEL FUEL DECONTAMINATION**  
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**DISTRESS SIGNALS**  
Datex, Inc., P.O. Box 1150, Kinder, LA 70648

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H.J. Maritime, P.O. Box 23123, New Orleans LA 70183  
J.W. Fishers, 65 Anthony St, Berkeley, MA 02079

**DOCK FENDERING SYSTEMS**  
Plastic Pilings Inc., 1485 South Willow Ave, Rialto, CA 92376  
Uniflame Products Corp., 17007 South Broadway, Gardens, CA 90248

**DOORS - MARINE A INDUSTRIAL**  
Mapco - Inc., 90 Forest Ave, Local Valley, NY 11560  
Juniper Intl., 72-15 Metropolitan Ave, Middle Village, NY 11379  
Waltz & Krenzer, 91 Wilentz Road, Oxford, CT 06478  
Manly Marine, PO Box 86788, N. Vancouver B.C. Canada V7L 4L3

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Crandall Dry Dock Engineers Inc, P.O. Box 50580A, Chelsea, MA 02150  
Heger Dry Dock Engineers, Inc., 13 Water St, Hillston, MA 01746

**DUCTORS**  
Via Motivator, 566 Parker St, Newark, NJ 07104

**ELECTRICAL EQUIPMENT**  
MMC International, 60 Inip Dr, Inwood NY 11095

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

**ELECTRICAL INSTRUMENTS**  
Selco USA 2508 Lake Brook a, Atlanta, GA 30360

**ELECTRICAL MOTOR DRIVES**  
Tedi Power Controls, 10507 Fairstone, Houston, TX 77099

**ELECTRONIC CHARTS**  
C-Map Commercial 133 Fairmount Rd, Westport, MA 02649

**ELECTRONICS**  
Azorix Corp, 900 Middlesex Tpke, Billerica, MA 01821  
C-MAP, P. O. Box 212, 4371 Eggsmund Norway  
Funuo USA Inc., 4400 NW Pacific Rim Blvd., Camas, WA 98607  
Sure Seal Connectors, 3591 South Plaza Dr, Suite 240, Santa Ana, CA 92704

**ELEVATORS**  
C-Map Commercial, 133 Fairmount Rd, Westport, MA 02649

**EMPLOYMENT**  
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Peter D. Juan ESQ, 14 Lafayette Court Greenwich Ct 06830

**ENGINEERING SERVICES I MARINE ENGS**  
Scientific Marine Services, Inc., 101 State Pl, Suite F, Escondido, CA 92029  
U.S.M.L.M.A., 300 Steamboat Rd., Kings Point, NY 11024  
Vtoech, Inc., Box 435, N. Kingston, RI 02882  
DB Engineering, 1000 South Main St, Mansfield, Texas 76063

**ENGINE ROOM LIGHTING/MONITORING A CONTROL**  
Mackey Communications, 2721 Discovery Dr, Raleigh, N.C. 27616-1851  
Maths Controls Inc., 675 Pease Rd, Burlington, WA 98232  
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017

**ENGINE ROOM REPLACEMENT PARTS**  
Mariso USA, Inc., 100 Davidson Ave, Sommerset, NJ 08873

**ENGINES**  
GE Marine Engines, 1 Neuman Way, Cincinnati, OH 45215  
Fairbanks Morse, 701 White Ave, Bolok WI 53111  
WARTSILA NSD CORPORATION, Box 252 Vasa Friand Fw65101

**EVACUATION SYSTEMS**  
DBC, 12261 Bridgeport Rd, Richmond, BC Canada  
**EVAPORATORS**  
Seasun Engineering, 7322 Tekeshina, 4-chrome, Nishiyodogawa, NY, Osaka555, Japan  
Alta-Laval Separatol Inc, 955 Meams Rd, Warrminster, PA 18974

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Gyo Chemical, P.O. Box 853, Deer Park, TX 775364653

**EXTRUDED RUBBER PRODUCTS**  
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**FANS - VENTILATORS - BLOWERS**  
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Jameson Distributors, P.O. Box 348, Jamestown, RI 02835  
Si'wboit P.O.B. 683, Carnegie, PA 15106

**FENDERING SYSTEMS/BUOYS - Dock I Vessel**  
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Duramax Marine, 16025 Johnson St, P.O. Box 67, Middletown, OH 44062-0067  
Seaward Int'l P.O., Box 98, Clearbrook, VA 22024  
Viking Fender Co., 1160 State St, Perth Amboy, NJ 08861  
Ultra Poly, Inc., 2926 South Steele St, Tacoma, WA 98409  
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Luber-Rite, Inc., 200 South 4th St, African, a 62806-1313  
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**FINANCING**  
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Nautical Safety Products, P.O. Box 590462, Houston, TX 774259  
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NoFile Technologies, 21 Industrial Ave, Upper Saddle River, NJ 07468

**FIRE TRAINING**  
Pott Caravel Marine Fire Fyfler Academy, Caravel Pott Authority, P.O. Box 267, Cape Caravel, a 32920

**FLANGES**  
Josee Entering, 5225 7th St E, Tacoma, WA 98424

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Instruments Computer i Controls, Inc., 70 South Bow Rd, Hookset NH 03106

**FUEL DECONTAMINATION**  
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Fuel Dynamics, 707 Mulet Dr, #110, Cape Canaveral, R. 32920

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Duchess Bakers Madway Co., 1101 Jdry Ave, Siberia WI 54880  
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Lang Manufacturing Co. 6500 Merrill Creek Pkwy, Everett, WA 98023

**GANGING A SAMPLING**  
Hemaclic Inc., 4522 Center St, Deepark TX 77536

**GAS TURBINES**  
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The Falk Corp, PO Box 492, Milwaukee, WI 53201-0492  
Marine Gears, P.O. Box 688, Greenville, MI 38702  
Cincinnati Gear Co., 5857 Wooster Pike, Cincinnati, OH 45227

**GENERATORS**  
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GMDSS  
Funuo USA Inc., 4400 NW Pacific Rim Blvd., Camas, WA 98607  
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017

**GOVERNORS**  
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Motor Services Hugo Stamp, 3190 S.W. Lauderdale, a 33315

**HATCHES AND DOORS**  
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Manly Marine, P.O. Box 86788

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Estate, Langley, B.C. Canada V4W 3S8  
Kahlerberg Bros Co., P.O. Box 358, Two Rivers, WI 54241  
Kockum Sonics, Inc., 933 Industry Rd, Ste105, Kenner, LA 70062

**HOSPITAL SHIP**  
Mercy Ships, P.O. Box 2020, Garden Valley, TX 75771-2020

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**INTEGRATED MONITORING SYSTEMS**  
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MONITORING SYSTEMS  
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MOTOR PROTECTION EQUIPMENT  
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TIMSCO, P. O. Box 91360, Mobile AL 36691  
Bard, Lavis, & Associates, 900 Ritchie Hwy, Suite 203, Severna Park, MD 21146  
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy, Arlington, VA 22202  
Bay Engineering, 253 N. First Ave., Sturgeon Bay, WI 54235  
C. Baxter & Associates, P.O. Box 9006, Mobile, AL 36609  
CDI Marine Co., 9590 Regency Square Blvd. Ste. 400, Jacksonville, FL 32222  
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R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073  
Kramer Masa Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401  
James S. Kroger, 799 Bickell Plaza Ste. 701, Miami, FL 33131  
MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626  
Alan C. McCure Associates, Inc., 2600 South Gessner, Houston, TX 77063  
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Bldg. MS 39535-4454  
MIL Systems, 200-1150 Marston Drive, Ottawa, Ontario K2H 8S9  
John J. McMillan Associates, Inc., 4300 King St., Suite 400, Alexandria, VA 22302  
Marine Design & Operations, Inc., 225 E. 1st Ave., Roselle, NJ 07068  
Maritech, Seacraft, Bay Road, Newmarket, NH 03857  
Maritime Design, 13000 Sawgrass Village Circle, Ponte Vedra Beach, FL 32082  
R.J. Mellusi & Co., 71 Hudson St., New York, NY 10013  
Nautical Designs, Inc., 2101 S. Andrews Ave., Suite 202, Ft. Lauderdale FL 33316  
M. Rosenblatt & Son, Inc., 2341 Jefferson Davis Hwy, Arlington, VA 22202  
Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112  
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029  
Sea School, 10812 Gandy Blvd., St. Petersburg, FL 33702  
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426  
George G. Sharp, Inc., 100 Church St., New York, NY 10007  
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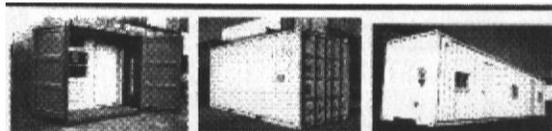
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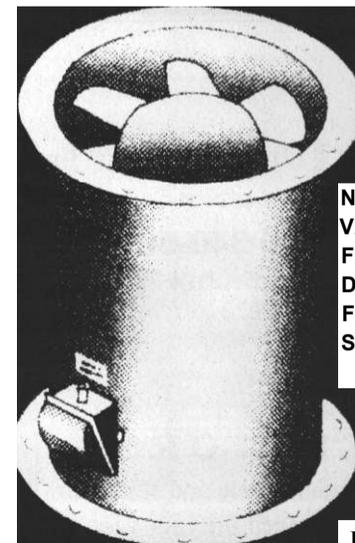
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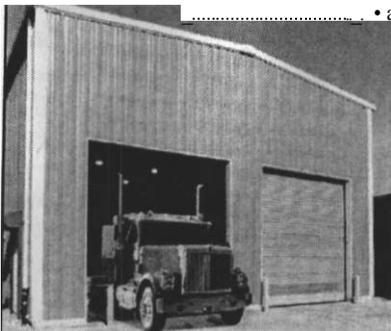
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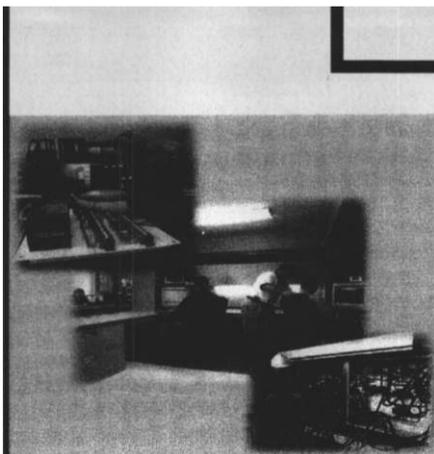
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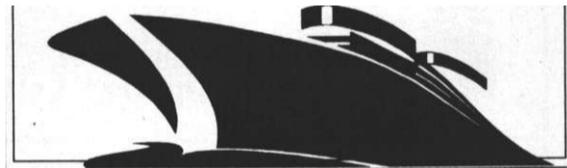
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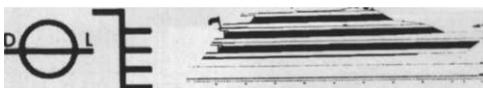
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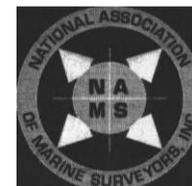
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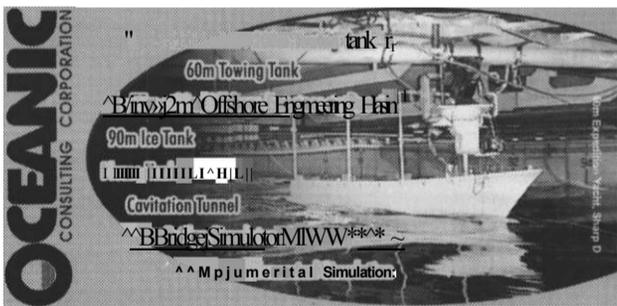
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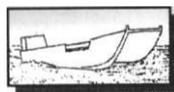
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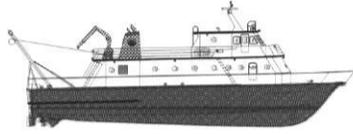
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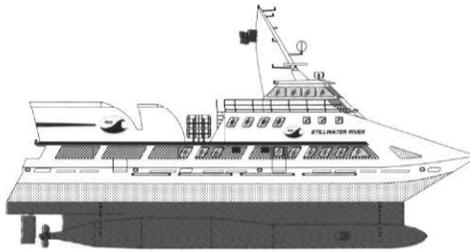
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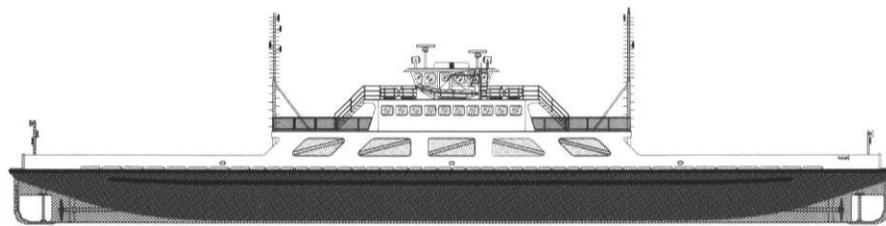
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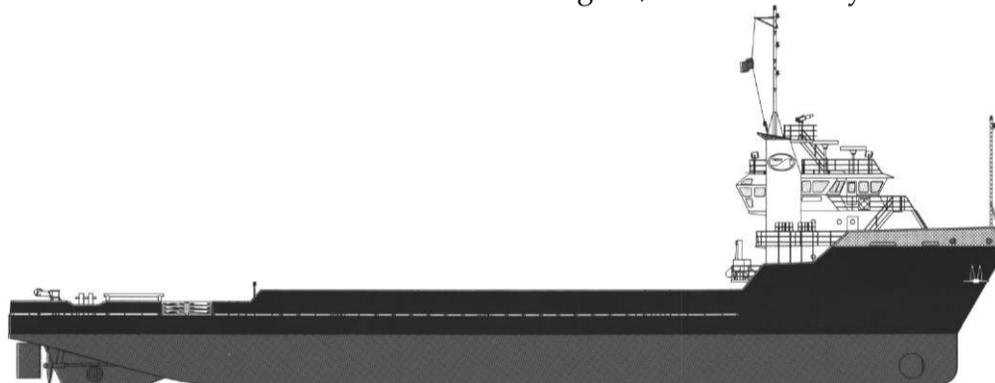
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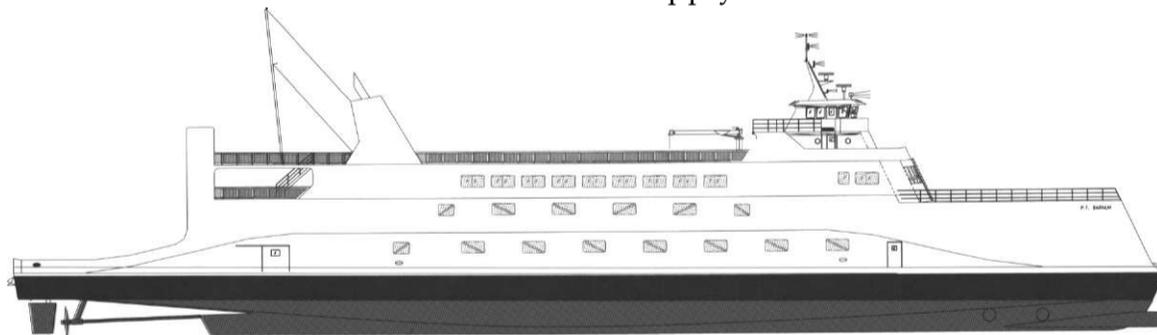
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