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REPORTER**
AND
ENGINEERING NEWS

Cruise Shipping

Poised for
international expansion

\$27 million rehab
completed on DRBA Ferry
Higher speed demands pose new
challenges for ship designers
Washington State Ferries
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JULY 1996

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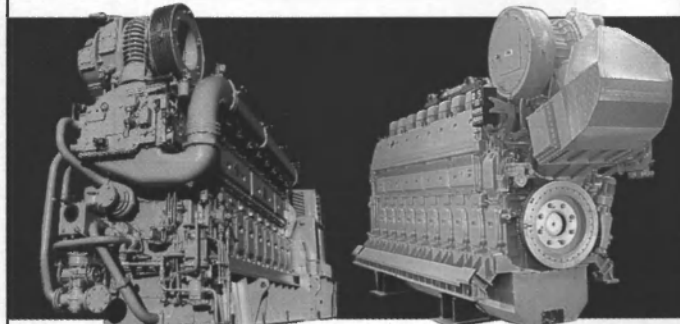
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On The Cover

This month's cover depicts the perspective of a Fincantieri crane operator viewing the stern of 100,000-ton superliner *Carnival Destiny*, under final outfitting at the Monfalcone yard. The Cruise Industry Annual begins on page 40.

20 The China Connection

European finance has secured a major interest in a series of new, standard-design cargo vessels being built in China.

— by Carol Fulford & Andy Smith

30 CAD/CAM • Picking up speed

As owners demand higher speeds from conventional-type ships, CAD/CAM solutions are being used to ensure vessel stability, safety and cost-effectiveness.

40 CRUISE INDUSTRY ANNUAL

The emergence of new tonnage has forced cruise lines to aggressively pursue higher capacity rates. Associate Editor Bridget Murphy spoke to top industry executives to get an insider's analysis of the market.

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COMING IN AUGUST...

LPD-17: A contract award on the last, new U.S. Navy project until the end of the century is expected in early autumn. *MR/EN* will review the bidding teams and provide an updated analysis of this high-profile project.

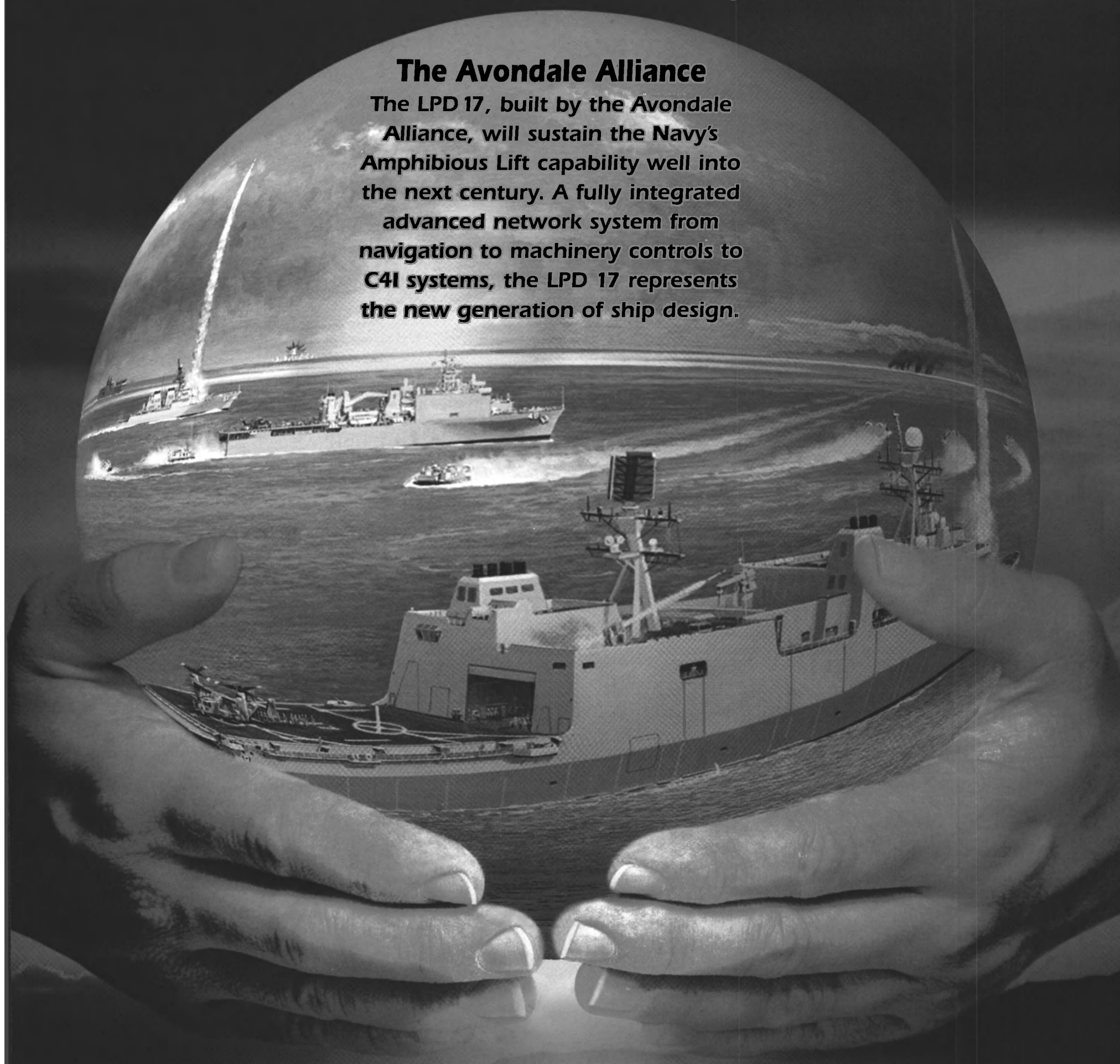
Gulf Coast Reviews: Business is booming in the Gulf. *MR/EN* will analyze the recent trend, and help forecast the near and long-term prospects.

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Atlantic Marine And Alabama Shipyard Team Up For Offshore Conversion

Atlantic Marine, Inc. and Alabama Shipyard, Inc. of Mobile, Ala., will join forces to perform the major conversion of Diamond Offshore's 528-ft. (164.5 m) drillship *Ocean Clipper*. Diamond Offshore, headquartered in Houston, has been involved in the offshore drilling industry for more than 25 years. The drillship will be converted from a conventional mooring to a dynamically positioned deepwater drill rig, capable of drilling in ultradeep water depths.

Alabama Shipyard will be performing derrick substructure renewals, cellar deck modifications and two pedestal crane additions. It will also be adding five thruster units and fabricating and installing sponsons for extra floatation. Atlantic Marine, Inc. will be performing major machinery modifications, including segregation of the engine room into two separate watertight compartments and installation of mudpumps. New

SCR drives will be installed, as well as a dynamic positioning system. Most of the equipment on the drillship will be upgraded to allow it to drill in deeper water. *Ocean Clipper* will also undergo routine drydocking repairs and services while on Atlantic Marine's drydock *Alabama*.

The vessel will be classed to ABS standards, and will be at Atlantic Marine for approximately eight months. Atlantic Marine, Inc. and Alabama Shipyard, Inc. are wholly owned subsidiaries of Atlantic Marine Holding Company of Jacksonville, Fla.

For more information on Atlantic Marine

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For more information on Alabama Shipyard

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"Speed creates new clients, both for passengers and freight"

Carl-Otto Dahlberg, Sene Ro's manager, is referring to

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Discharges eight products simultaneously

Astilleros Españoles continues to win interesting new contracts. For instance a trio of chemical

product tankers, two for the Norwegian 30-Tankers and one for the British owner Biscaya Bay.

The hulls have 24 stainless steel cargo tanks and the ship is able to discharge eight different products simultaneously.

First tuna ships to have processing decks and more on board

Three of the four vessels being built at Sene Ro's yard are even longer than the biggest tuna steamer ever built. Two of them will break new ground in the industry by having processing decks and plate freezing equipment on board.

The ships will rely on seawater temperature and seawater colour charts from satellites, load-spreading, rednet, speed logs and chartered spinnaker planes. This spinnaker net seems to be more economical than the costly helicopter landing pad and associated firefighting equipment installation.

A FPSO able to continue to produce well into the 21st century

The 'Ugoe Com' looks set to prove itself a valuable North Sea asset for Murvater which has formerly been active in the Far East market.

When Ugoe and Pagan have come to the end of their field lives, Bluewater will have a FPSO which should be able to continue production well into the 21st century.

An innovative arrangement for Sweferry

The cargo area of this multi-deck passenger ferry is configured in two lower levels and features an innovative arrangement for a main lift.

AESA in Sestao, Seville, Cadix and Puerto Real; ASTANO in Ferrol; ASTANDER in Santander; AJAANA in Gijón; BARRERAS in Vigo and MDE in Marín

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"Speed creates new clients, both for passengers and freight"

Carl-Otto Dahlberg, Sene Ro's manager, is referring to

the four ro-rox vessels to be built at the Puerto Real yard.

The new vessels will be able to operate at 22 knots, compared with the current speed of about 16 knots in these lines.

The four new ro-rox vessels in order at Puerto Real for Sene Ro-Bo will therefore offer a 35% increase in speed.

2,400 TEU (TMM) container ships to be run by a crew of 16

As well as capacity and speed, a priority was an

ability to operate and maintain each ship efficiently with a crew of 16.

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The length of this DFDS vessel was increased by inserting a new long mid

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Watch this space. It tells you how shipowners benefit from our profit policy. But follow this series because we have more to show for your profit.

(Nr. 4 of a series)

Circle 208 on Reader Service Card

Before you hang a computer on a process, you better make sure it's the right process. If it is a bad process, the computer will help you get the wrong answers quicker," said Capt.

Maurice Gauthier, LPD-17 program manager, U.S. Navy, when he was in New York recently.

His message, in context, was part of an overall description of how his team has had to change its

approach to the processes involved in procuring a U.S. Navy ship in today's tight economic times.

Considered in a broader context, the statement could be construed as a mandate for designing, build-

ing and owning ships beyond the year 2000.

Without belittling the importance of international accords, it seems that disproportionate attention

is often paid to the unpredictable, oft-changing political side of the maritime industry, when a focus on productive building practices and the formulation of long-range business plans would perhaps produce higher dividends.

At press time, the fate of the OECD agreement was still in question, as the agreement had been amended by the U.S. Congress to extend the terms of the popular Title XI program beyond the negotiated deadline. International reaction, to put it mildly, has been harsh.

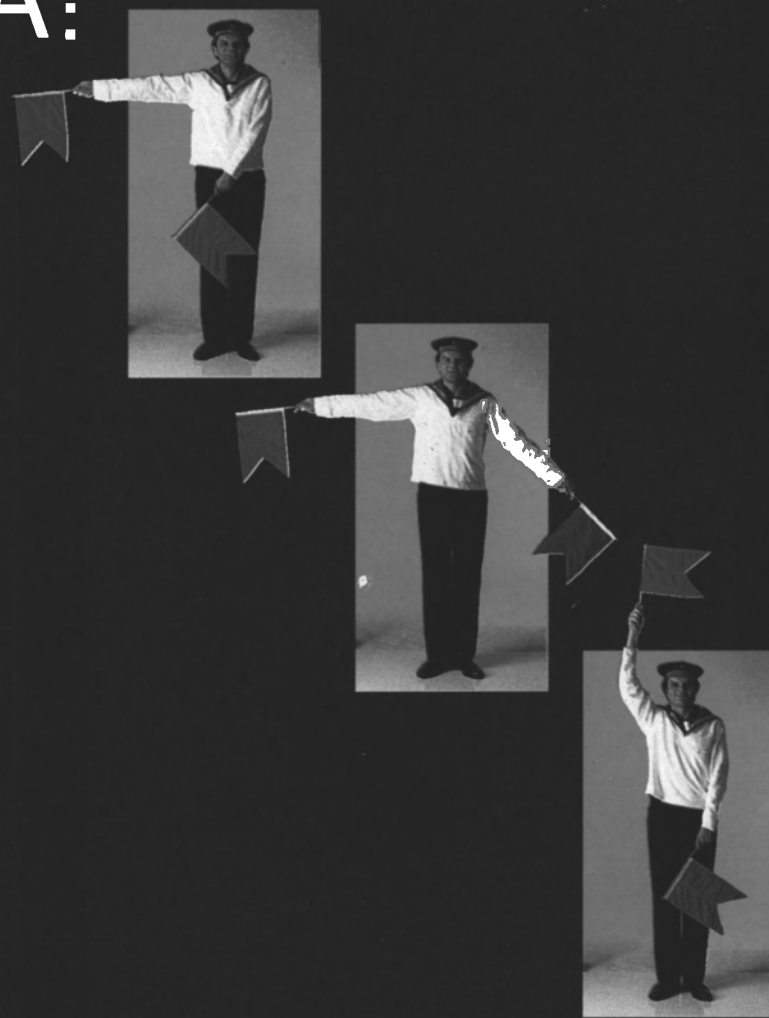
All news this month, however, is not dour. Our Cruise Industry Annual shows how several U.S.-based cruise ship operators can be considered the template for 'doing it right.'

Associate Editor Bridget Murphy took a whirlwind, three-day trip through South Florida to visit some of the most influential cruise ship executives in the world. Her report, complete with insights from Royal Caribbean's Richard Fain, Disney's Art Rodney and Carnival's Maurice Zarmati and Vicki Freed, starts on page 40.



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Washington State Ferry Awards Propulsion Contract To Siemens

by Kathleen Gleaves,
contributing editor

The Washington State Ferry (WSF) System recently awarded Siemens Energy and Automation, Inc. the contract for propulsion control system replacement on

three steel electric class ferries. The 256-ft. (78-m) vessels are part of the largest ferry fleet in the U.S., which consists of 22 auto ferries and three passenger-only vessels. The ferry system serves 20 terminals in Puget Sound, Wash., and Sidney, B.C.

The three ships were built in 1927, and completely rebuilt for WSF between 1985 and 1987. With nine years of propulsion control failure problems on record, the U.S. Coast Guard (USCG) required that the company choose between a permanent solution or the removal

of the vessels from service.

Problems have not only rendered ships dead in the water, but have also caused damage to docks, as the ships have lost control at crucial moments. Many incidents necessitated removing vessels from service, leaving the already overburdened ferry system short on its busiest runs.

In addition, dock repairs left various terminals out of service for periods ranging from several days to several weeks.

After an initial review of the Request For Proposal, there were only two competitive bidders left in the competition. While Siemens' bid price of \$6,888,138 for the three complete systems was reportedly slightly higher than the other competitors, both bids were well below WSF engineers' estimates of approximately \$7.5 million.

The final proposals underwent an intense technical evaluation procedure, which analyzed many different factors, and assigned numerical scores for each. More than half of all possible points went to performance and reliability factors, where the Siemens' proposal scored higher overall.

New Technology Needed

The obsolete analog system on the three WSF ferries has been problem-plagued since its installation. Replacement parts had to be custom-made, and quality control was reportedly low. The analog system settings varied with each of the three boats and were said to be difficult to troubleshoot.

The new digital product from Siemens is self-monitoring with built-in self-diagnostic capabilities. That is, internal sub-programs interpret trouble signals and component failures, and provide that information to the operator. Additionally, it uses open-stock parts, which are readily available from the manufacturer and third-party suppliers. The entire system has the added advantage of being composed of off-the-shelf components using industry-proven technology.

By contract, Siemens is required to support the system for 15 years, the projected end of the useful life of the vessels. WSF's long-range plans call for the replacement of these ships with higher-performance vessels.

The project requires removal and replacement of the propulsion controls and the electric propulsion drives. The new solid state motor drives will be built at the Siemens Industrial Drive Division in Alpharetta, Ga. The control console, computerized alarm and monitoring system and switchboard control system will be designed and built by Siemens Marine Systems in Montreal, Quebec. The alarm and monitoring system is



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Maritime Reporter/Engineering News

nearly identical to the system recently installed on M/V *Klahowya*, another WSF vessel.

Crew training was an important component in the bid evaluation. Siemens will provide three weeks of classroom training for each crew, as well as two months of onboard operating, maintenance and repair training. Work will begin after the busy summer season, with the M/V *Nisqually* first on the worklist. The 75-car, 800-passenger vessel will make voyage through the Hiram D. Chittenden Locks to Lake Union Dry Dock, and work will take approximately six months to complete. M/V *Illahee* and M/V *Quinault* will follow. To ensure a smooth refit, Siemens is setting up an on-site office near the Lake Union facility. Project Manager **Maryse Langevin** from Siemens Marine's headquarters in Montreal, and Contract Administrator **Nina Sdunzig** will staff the office, while **Andre Godin, P.E.**, will be the on-site engineer and liaison between the company and shipyard.

The WSF system has three Jumbo Mark II auto ferries under construction at Todd Shipyards in Seattle, Wash. Siemens is the propulsion control, and alarm and monitoring provider for these ships as well.

Exxon Finalizes Agreement In \$15 Billion Project

Project estimated to produce 2.5 billion barrels of crude oil, 15 trillion cubic feet of gas

Exxon Corporation announced that an agreement has been reached by the Sakhalin I Consortium to formally declare the Sakhalin I Production Sharing Agreement effective June 10, and begin evaluation work on the billion Sakhalin I project, offshore Sakhalin Island, worth an estimated \$15 billion.

The project would involve the development of an estimated 2.5 billion barrels of crude oil and condensate and 15 trillion-cubic-ft. of gas, equal to a total of 5 billion oil equivalent barrels, in three offshore fields. The fields are located in water depths of up to 165 ft. (50.3 m), 15 to 20 miles off the northeastern coast of Sakhalin Island.

K.T. Koonce, chairman of Exxon Neftegaz Ltd., an affiliate of Exxon Corporation, stressed the importance of this significant multinational project to the people of Sakhalin Island and the Russian Federation. "The Sakhalin I project should make a major contribution to economic growth in the Russian Far East region. According to our estimates, over the life of the project, Sakhalin I

could generate many billions of dollars in revenues from sales of hydrocarbons and be responsible for the creation of thousands of jobs. The majority of the investment and operating expenditures required for labor, materials and services is expected to go directly to the Russian private sector."

In keeping with the consortium's desire to proceed as rapidly as possible, a well will be drilled and tested, and state-of-the-art 3D

seismic work will be conducted this summer. The well will be drilled in the Arkutun-Dagi field using Sakhalinmorneftegas' OKHA drilling rig.

This is the first part of a \$200 to \$300-million resource appraisal program that is required to better define estimates of reserves in the three fields, Chayvo, Odoptu and Arkutun-Dagi. The appraisal program includes drilling, coring and testing additional wells, as well as

conducting additional 3D seismic surveys.

The multinational Sakhalin I Project Consortium includes two Russian companies, Rosneft-Sakhalin and Sakhalinmorneftegas-Shelf, the Japanese company Sakhalin Oil and Gas Development Co., Ltd., (SODECO) and Exxon Neftegaz Limited, an affiliate of Exxon Corporation and operator of the project. Exxon and SODECO each



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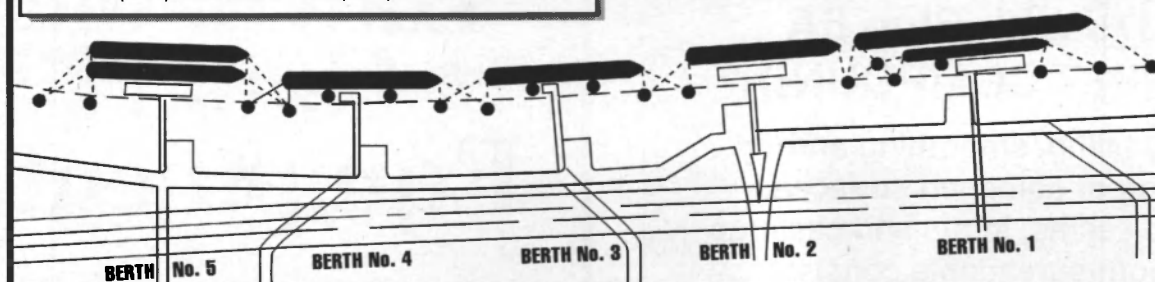
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have a 30 percent interest, while Sakhalinmorneftegas-Shelf and Rosneft-Sakhalin have a 23 and 17 percent interest, respectively.

Potential Development Description

The development of the three fields will involve a combination of large, ice-resistant platforms and subsea templates. Significant onshore facilities, pipelines and project infrastructure will have to be established on the island in order to support the project and the export of oil and gas. Portions of the onshore facilities and pipelines may be a joint industry project serving all offshore Sakhalin fields.

Production from the project will be available to both local and export markets. Russian members of the consortium and the foreign partners will be responsible for marketing their own respective shares of production.

Project Timeline

Feb. 1991 — Exxon and SODECO agreed to jointly pursue Sakhalin offshore tender opportunities.

Nov. 1993 — Russian Federation Government and Sakhalin Oblast grant rights to negotiate for Sakhalin I exploration and development including the Chayvo, Odopto, and Arkturm-Dagi fields to Exxon and SODECO.

Dec. 1993 — An agreement was signed by the Russian Federation Government, the Sakhalin Oblast, Sakhalinmorneftegaz, and Exxon/SODECO to perform Technical and Economic Calculations (TER) for the evaluation of the development of the Sakhalin I fields.

Sept. 1994 — The TER was submitted for expertise review and approved as the basis for further PSA negotiations.

May 1995 — Rosneft-Sakhalin and Sakhalinmorneftegaz-Shelf joined Exxon and SODECO in a Consortium to develop the Sakhalin I fields through the JOA.

June 1995 — The Sakhalin I PSA was approved by the Russian Federation Government, the Sakhalin Oblast, and the Consortium.

Jan. 1996 — The Russian Federation Government adopted the Law on Production Sharing. Work continues on additional legislative and normative acts that will be required to complete the legal and fiscal framework for PSAs.

June 1996 — Licenses are granted to the Consortium by the Russian Federation Government and the Sakhalin Oblast covering the Sakhalin I fields.

\$159 Million Navy Contract Awarded

The U.S. Navy has awarded a \$159 million contract to the Lockheed Martin-Raytheon-Northrop Grumman team for the design, development, integration, and testing of the New Attack Submarine (NASN) command, control, communications and intelligence (C3IS) for sonar, combat control and architecture subsystems.

As one of the principal subcontractors to Lockheed Martin Federal Systems, Raytheon Electronics Systems (RES) will receive an initial contract for approximately \$40 million dollars to begin design efforts on the program.

Raytheon will be responsible for the combat control subsystem, which coordinates all targeting and torpedo/missile launches, and for the transmit portion of the sonar subsystems.

"This is an important win for our Portsmouth, R.I., operations and helps solidify our role as a key player in designing and producing combat control systems for the Navy," said **Walter V. Trainor**, vice president and manager of naval programs for RES.

The NASN is the Navy's next-generation attack submarine and is designed to ensure that the Navy can maintain battlefield dominance of undersea warfare.

The Raytheon work will be performed at its Portsmouth, R.I. operations.

For more information on Raytheon
 Circle 61 on Reader Service Card

Maritime Reporter/Engineering News



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PROPULSION UPDATE

New Generation Of Propulsors Chosen For New Ferries

Aquamaster-Rauma of Finland has secured an order for eight 3,000-kW Contaz propulsors, to be fitted to a pair of train/car ferries recently ordered by DSB Rederi AS in Denmark. The order is viewed as a milestone by Aquamaster-Rauma, as it is an important step in establishing its propulsion system as a well-known brand.

The double-ended "drive though" passenger/car and railway ferries are built for service around the clock on the ferry route between Rødby in Denmark and Puttgarden in Germany. The ships will be built for DSB Rederi AS by Ørskov Staalskibsvaerft, Denmark, and are scheduled to be delivered in May and October 1997. The electrically driven propulsors are powered by ABB's Sami Megastar technology.

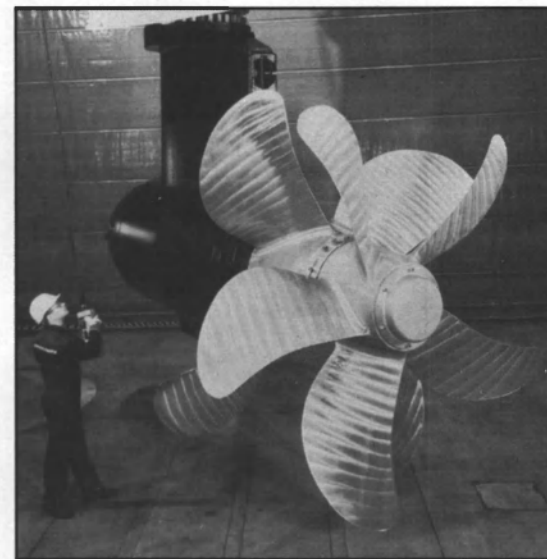
The propulsion system is designed for quick maneuvering and operation in all weather conditions. The normal service speed will be 16.5 knots, providing a crossing time of 44 minutes. The maximum service speed of 18.5 knots will

provide a 39-minute crossing time.

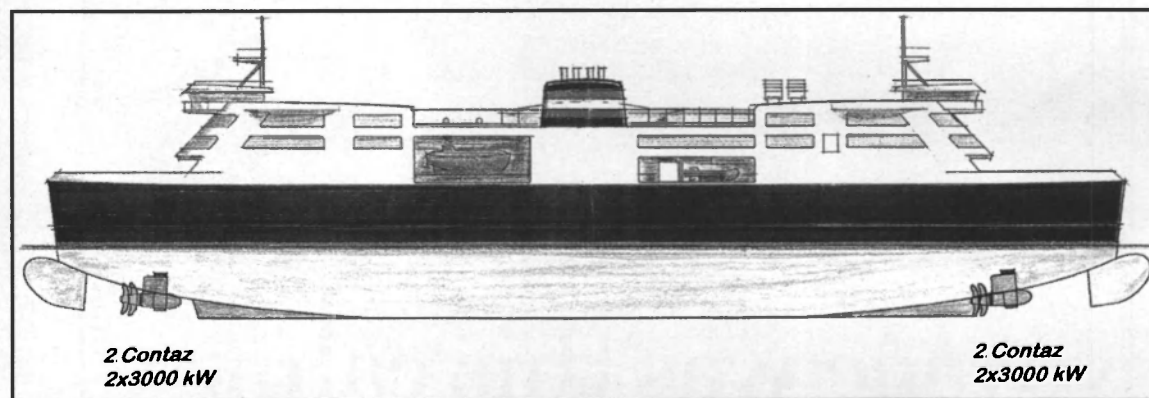
The Contaz propulsors will be fitted at the sides of each end of the ship, making it possible to obtain an optimum hull form and to fit a specially designed bulbous bow at each end. Based on the model tests, this concept, together with the high efficiency of contra-rotating propellers, is expected to exceed savings as much as 20 percent in fuel consumption compared with a conventional design. An additional benefit is that the building costs of the ship can be reduced with lower power and noise insulation demand.

The design is based on contra-rotating propeller technology, which is known for high propeller efficiency, as well as a low noise and vibration level. The Contaz propulsors are designed with a streamlined body form to allow higher speed than traditional thrusters.

The first new generation Contaz units were delivered at the beginning of the year for a Norwegian platform supply vessel to be supplied to DOF Management by Brattvaag Shipyard next summer. The vessel features a



pair of 2,200-kW Contaz units.
For more information on KaMeWa
Circle 14 on Reader Service Card



Main Particulars of Double-Ended Ferries

Propulsion	..... Diesel Electric
	..... 4 x 3,000-kW type ABB Sami megastar
Propulsion units	..... Aquamaster-Rauma
	..... 4 Contaz propulsors
Length	..... 465.8 ft. (142 m)
Breadth (over fender)	..... 83.3 ft. (25.4 m)
Max. draft	..... 19 ft. (5.8 m)
DWT	..... 2,400
Passengers	..... 900
Cars, upper deck	..... 126

New Medium-Sized Containership Design Nears Completion

A flexible new containership design, which maximizes payload and stability with only negligible increases in specific resistance/power requirements, is set to be debuted by a U.S. company.

Halter Marine Inc. of the Trinity Marine Group, in conjunction with the Advanced Research Projects Agency (ARPA) and the

U.S. Department of Defense (DOD), is nearing completion of the design development of the innovative, medium-sized containership. The Trinity Sea Shuttle design incorporates inventive concepts intended to make it a profitable vessel throughout its life cycle. "With the increasing requirement for medium-size, high payload con-

tainerships to accommodate the medium and short-length ocean and inter-island routes, the Trinity Sea Shuttle, with its unique flexibility in design, modular construction, and shallow draft and cargo capacity, fills the void nicely," said **John Dane III**, president, Trinity Marine Group. The basic design measures 402 ft. (123 m) long and has a maximum capacity of 946 TEUs. A "stretch" version measures 490 ft. (149 m) long and has a capacity of 1,234 TEUs.

Designed for the international market, the Sea Shuttle is available in several configurations including various length and beam dimensions, and either flush deck or hatchless versions. The vessel was purposely designed to be flexible and modular, so a variety of owner preferences in the vessel configuration and equipment options can be accommodated.

The design of the vessel permits a high degree of flexibility in the final configuration, such as an optional 88-ft. (27-m) mid-body plug, aft ramps for RoRo applications, multiple accommodation layouts, reefer plugs and loading flexibility.

For more information on the new containership design
Circle 18 on Reader Service Card




Stolt Parcel Takes Delivery Of Stolt Innovation From Danyard

Stolt Parcel Tankers, Inc., part of the Stolt-Nielsen SA group, has taken delivery of M/T *Stolt Innovation*, the first in a series of ten 37,000-ton Innovation-class chemical parcel tankers, from the Danyard shipyard in Frederikshavn, Denmark. Formally commissioned on May 29, the new ship incorporates features which set new standards of environmental protection, safety and operating efficiency. Seven of the Innovation-class ships are being built by Danyard, while the other three will be constructed by the Societe Nouvelle des Ateliers et Chantiers de l'Atlantique du Havre (SNACH) yard in Le Havre, France. The remaining nine tankers in the series will be delivered at regular intervals through the end of 1998.

M/T *Stolt Innovation* has 42 integral and four deck cargo tanks, all constructed of solid stainless steel, and all fitted with separate pump and pipeline and able to handle hazardous and corrosive cargoes (IMO Type 1). M/T *Stolt Innovation* is thought to be the first chemical tanker to be fitted with medium-speed, diesel-electric propulsion instead of a conventional slow-speed diesel propulsion.

Stolt-Nielsen SA is a leading provider of transportation services for bulk liquid chemicals, edible oils, acids and other specialty liquids.

Maritime Reporter/Engineering News

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Circle 294 on Reader Service Card

Raytheon To Purchase Assets Of Standard Radio

Raytheon Company announced that it has completed the transaction to purchase certain assets of the marine communication business of Standard Radio AB of Sweden. Standard (Stockholm, Sweden), is a manufacturer of shipboard communications equipment which complies with international requirements for the Global Maritime Distress and Safety System (GMDSS) and point-to-point communications systems for land-based applications. Sales of these products in 1995 were approximately \$7 million. These product lines will become part of Raytheon

Marine's marine electronics business with sales of more than \$200 million to the merchant shipping, commercial fishing, recreational boating and government markets worldwide.

Standard Radio product lines are highly complementary with Raytheon Marine's existing radar and navigation products. This acquisition will also allow Raytheon to compete more effectively in the worldwide marketplace because the combined companies can now offer shipowners and builders complete solutions for integrat-

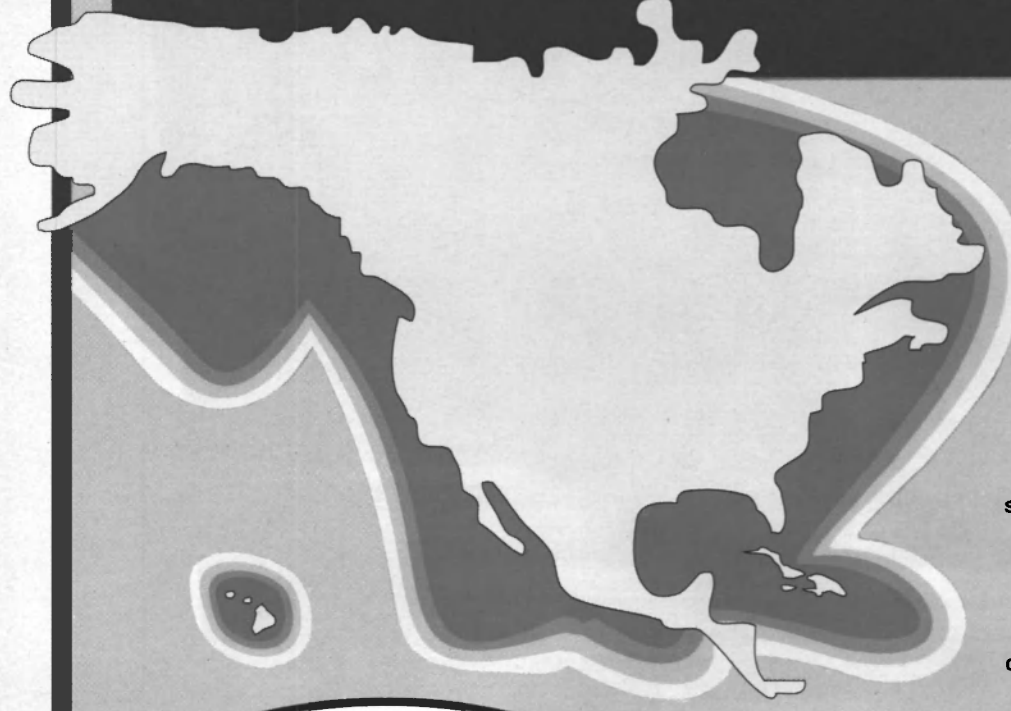
ed ship control, communications systems, and sensor inputs from radar, global positioning systems and gyro compasses. Raytheon Marine employs more than 1,000 people worldwide, with operations in Manchester, N.H. (U.S.); Portsmouth (U.K.); and Kiel (Germany). Raytheon Company, headquartered in Lexington, Mass., is a \$12-billion international, high technology company which operates in four businesses: commercial and defense electronics; engineering and construction; aviation; and major appliances.

Keel Laid For World's Largest FPSO

The initial keel section for the world's largest newbuilding Floating, Production, Storage and Offloading (FPSO) vessel was laid in the 556 x 93-m building dock at Harland & Wolff, Belfast. The weldment, a centerline keel section weighing 461 tons and measuring 36 x 17 x 6.5 m, was lowered into position using an 840-ton capacity Goliath crane. The FPSO is being built to store 950,000 barrels of oil, for use at the Schlehallion discovery, west of Shetland.

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"Watch" On The One-Man Bridge Continues

The debate over the acceptability of one-officer watch at night was recently revived at the meeting of the International Maritime Organization (IMO). The result of the meeting — among other safety measures discussed and adopted — was to continue trials involving ships with just one officer on watch during dark hours.

The trials are scheduled to continue until the end of 1997, at which time the test results will be submitted to the IMO for further evaluation.

The trials were dropped last year following pressure from several member states. After the trials conclude in 1997, the member states will reconsider the advisability of amending the convention on Standards of Training and Watchkeeping for Seafarers (STCW) to permit solo watchkeeping at night.

Radio Holland Completes Innovative Installations

Radio Holland recently completed several innovative installations. One involved an integrated voyage event recording package, a system which integrates electronic charting systems and voice data from the bridge. All pertinent navigational data, such as the electronic chart that is in use, GPS position, speed, heading, course, route, way points, tide and currents, wind speed and direction, water depth, radar targets and data, cross track error, rate of turn, date and time, can be replayed via an off-the-shelf IBM compatible personal computer. One recorder can handle up to 64 input channels, with up to 21 days of history.

Other recent jobs for the supplier include the installation of custom-made anti-hijacking equipment (for cruise liners) and thermal imaging cameras for non-cruise line marine applications.

For more information from Radio Holland Circle 143 on Reader Service Card

USS Inchon Redesignated For New Mine Warfare Mission



USS Inchon has returned to Fleet duty following a 15-month conversion at Ingalls Shipbuilding in Pascagoula, Miss.

Helicopter carrier USS *Inchon* was redesignated for a new mission as a mine countermeasures command, control and support ship on May 24 at Ingalls Shipbuilding, a division of Litton Industries. The ship, which has been at Ingalls undergoing a significant conversion and overhaul for the past 15 months, sailed from the shipyard on May 29. The 602-ft. (183.4-m), 18,340-ton ship has a crew of 650, and will be homeported in Ingleside, Texas.

"What has happened in this ship's conversion represents a revolutionary change," said Radm. **John D. Pearson**, USN, commander, Mine Warfare Command. "I want to acknowledge the efforts of 'Team Inchon' — Ingalls Shipbuilding, SupShip (Supervisor of Shipbuilding) personnel and the crew of USS *Inchon*, and emphasize the fantastic work of the hull, mechanical and electrical elements of this shipyard."

Ingalls built USS *Inchon*, and originally delivered the ship in 1970.

For more information on Ingalls
Circle 1 on Reader Service Card

Kvaerner Delivers Additional LNG Carrier To UAE

The delivery of Kvaerner Masa-Yards' second 135,000-sq.-m. LNG carrier *Mraweh*, ordered by Abu Dhabi National Oil Company (ADNOC), of the United Arab Emirates (UAE), took place on June 3. The flag ceremony was held onboard the vessel, which is stationed at the southern coast of England, after extensive gas trials in the area.

Mraweh is one of the largest LNG carriers in the world, and will be followed by two sister-ships in 1997. The order for four LNG carriers was placed in April 1993. The first vessel, *Mubaraz*, was delivered in January, and has since been successfully engaged in transporting LNG from the Das Island of Abu Dhabi Gas Liquefaction Company to Tokyo Electric Power Company (TEPCO) in Japan.

The LNG cargo containment system is based on the Kvaerner Moss-type spherical aluminum tank concept. These LNG carriers are the first 135,000-sq.-m. capacity carriers with only four spherical cargo tanks. The LNG tank manufacturing method was developed at the Turku New Shipyard.

For more information on Kvaerner Masa-Yards
Circle 53 on Reader Service Card

Mraweh main particulars

Length o.a.	951.4 ft. (290 m)
Breadth	157.8 ft. (48.1 m)
Design draft	37 ft. (11.3 m)
Gross tonnage	116,703
Service speed	19.5 knots

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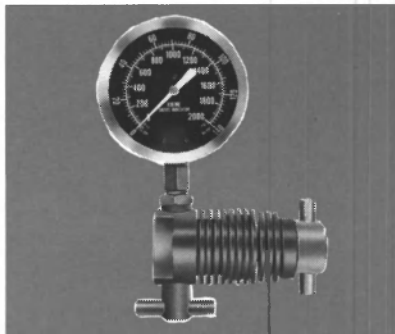
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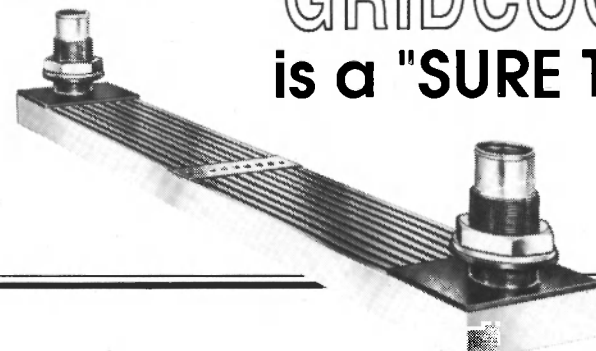
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ABS Launches Products To Advance Ship Safety

American Bureau of Shipping (ABS) has introduced SafeHull '96 and SafeNet, announced Chairman **Frank J. Iarossi**. SafeHull '96 is an extension of ABS' revolutionary SafeHull system, a dynamic-based method for design and evaluation of ship structures. The SafeHull '96 initiative extends this technology from tankers and bulk carriers to containerships. It also introduces more flexible and user-friendly features including Window PC and workstation operating environments.

"The capability to perform dynamic analyses through SafeHull has armed ABS with a unique and powerful tool. This gives us the capability to analyze ship structures from a real life, first principles basis, in a way not previously avail-

able to the marine industry," said Mr. Iarossi. "Having developed its use to identify critical structural areas during the design and evaluation phase and to realistically account for the dynamic loading pattern a ship experiences throughout its lifetime at sea, ABS is now taking the application of SafeHull into another dimension by incorporating it into an entirely new ship management product called SafeNet."

SafeNet is a life cycle ship management and information network designed to assist shipowners with the increasingly complex task of managing their vessels.

The network will reportedly give owners the capability to directly access all classification-related technical and survey information for

both the machinery and hull structure on ABS vessels. ABS and the owner will be able to work together to continually assess the integrity of both hull and machinery in order to develop a planned maintenance program for executing surveys, maintenance and repair.

The mission of ABS is to promote the security of life, property and the environment through the development and verification of standards for the design, construction and operational maintenance of ships and marine-related facilities. In keeping with this mission, SafeHull and SafeNet have been developed in response to needs expressed by the marine industry.

For more information on ABS
Circle 118 on Reader Service Card

P&O Orders Two Containerships From Japanese Shipyard

P&O Containers has signed an agreement with Japanese Shipyard IHI to build what will reportedly be two of the world's largest containerships. The new ships will each have a capacity of 6,674 TEUs, greater than any containership currently in service, and will be driven by one of the most powerful marine diesel engines ever built.

When the vessels are delivered in

1998, it is expected that they will join the Grand Alliance operation between Europe and the Far East.

"The investment in ships of this size reflects not only the continuing growth of world trade and containerized cargo in particular, but also the benefits of scale coming from our membership of the Grand Alliance," said P&O Managing Director **Robert Woods**. "By utilizing ships with this capacity, we are able to manage our tonnage effectively, and together with our partners in the Grand Alliance, provide a service that will meet the demands of our customers in the future."

Astilleros Espanoles Signs Contract For Two Containerships

Astilleros Espanoles has secured a contract for a series of two containerships which will be built at its Barreras yard in Vigo. The order has been placed by Naviera del Odriel, a Spanish owner operating in partnership with Sea-Land, a leader in cargo transport.

Total capacity of the ships will be 1,000 TEU — 200 of which will be refrigerated. A flexible design has been adopted, therefore containers

of different lengths and heights can be accommodated. The vessels will be operated between mainland Spain and the Canary Islands, as well as around the Mediterranean Sea.

For more information on
Astilleros Espanoles
Circle 19 on Reader Service Card

Main Particulars

Length o.a.	475.7 ft. (145 m)
Breadth, molded	75.4 ft. (23 m)
Speed	19 knots
Main engine	Manises Diesel Engine Co.

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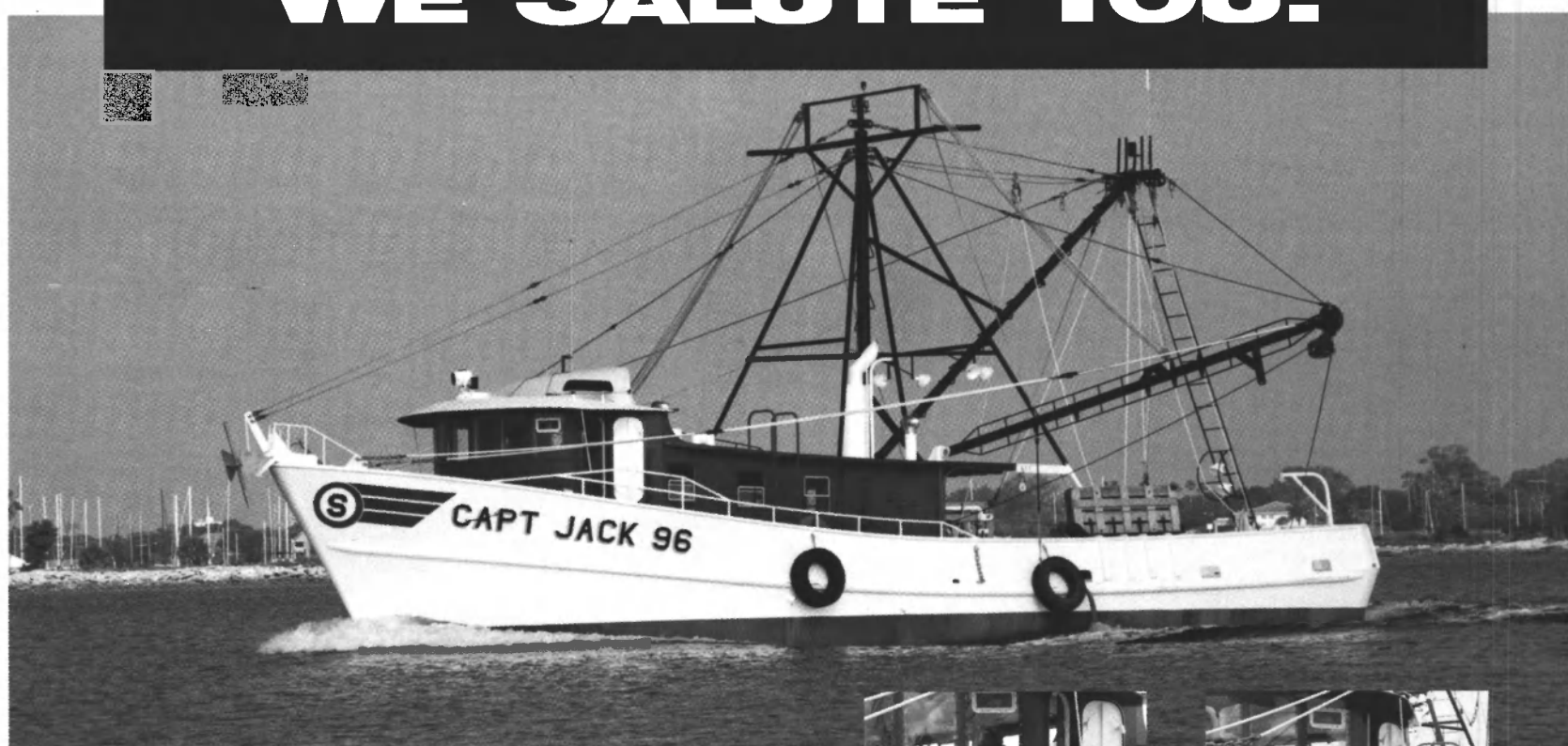
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On May 10, 1996, peers, friends and associates from all areas of the seafood industry and all over the world, gathered at Sahlman Seafoods, Inc.'s office in Tampa, Florida, to pay tribute to its CEO, Jack Sahlman. The newest vessel to join the fleet, the "Capt. Jack '96," was christened by her namesake, and a reception was held where food, drink and good company were enjoyed by all. The event was sponsored by Sahlman's fleet builder Steiner Shipyard, Inc., and other major vendors.



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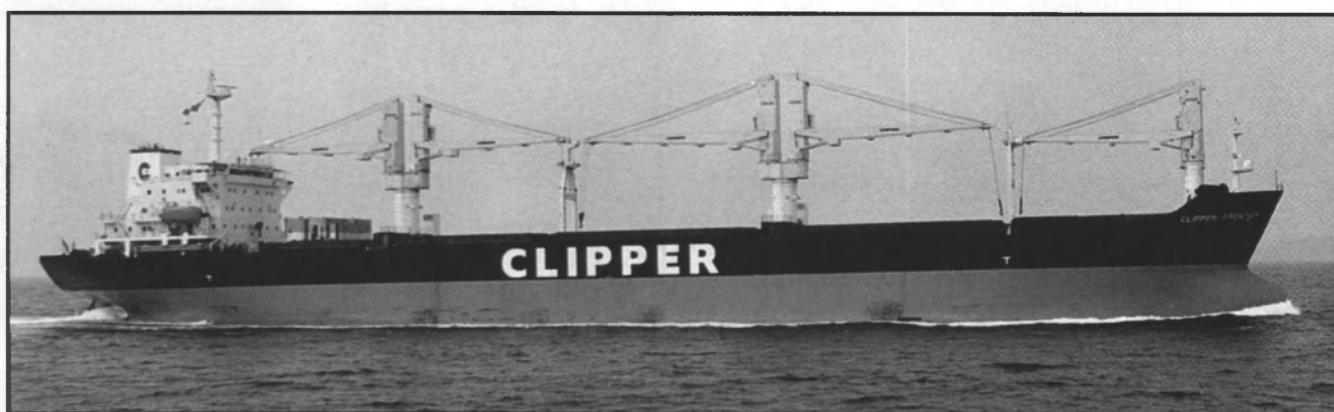
European money backs standard cargo carrier concept

by
Carol Fullford & Andy Smith
contributing editors

European finance has secured a major interest in a series of new, standard-design cargo vessels being built by the Dalian Shipyard in China. The first, *Clipper Fantasy*, has now been delivered to her owners and chartered to Denmark's East Asiatic Company.

Scandinavian and German companies, incorporating numerous joint ventures, constitute the lead investors in this and the nine additional confirmed orders (including recently completed *Clipper Frontier* and *Isabe Oldendorf* orders). The 28,000-dwt *Fantasy* class, multi-purpose cargo vessel is the first design from GTR Campbell of Quebec to reach production since George Campbell designed the *Freedom*, *Fortune* and *Friendship* classes of the 1960s and 70s. These classes of ships were produced in substantial numbers and represent perhaps the most successful series of standard designs since World War II.

The *Fantasy* class has been developed jointly by GTR Campbell with Algoship Designers Ltd. of Nassau, and the Dalian Ship Design and Research Institute. A primary consideration was to produce handy-sized, multi-purpose cargo vessels, capable of entering secondary ports where water is limited and cargo handling facilities are basic, or even non-existent. In the past, this requirement was met by the



legendary Liberty ship, a vessel which offered a cargo capacity of 10,000 tons at 10 knots. The ships were available in large numbers after World War II, but by the 1960s, the aging ships were in need of renewal.

The first GTR Campbell design, the 14,000-dwt *Freedom*, emerged as a major contender for the Liberty replacement. The new design featured a tonnage capacity approximately 50 percent greater than the Liberty ships, with a service speed increase of 45 percent to 14.5 knots. Subsequent GTR Campbell designs, such as *Fortune*, included increases in dwt to 21,000 tons, while service speed remained fairly constant at 14 to 15 knots. This proved to be the optimum balance between fuel economy and speeds. Again there is a demand for the replacement of this type of standard vessel, but the demand has been for a vessel with increased tonnage, which is in line with the general growth in ship tonnage over the last 20 years. There is also a need for substantially

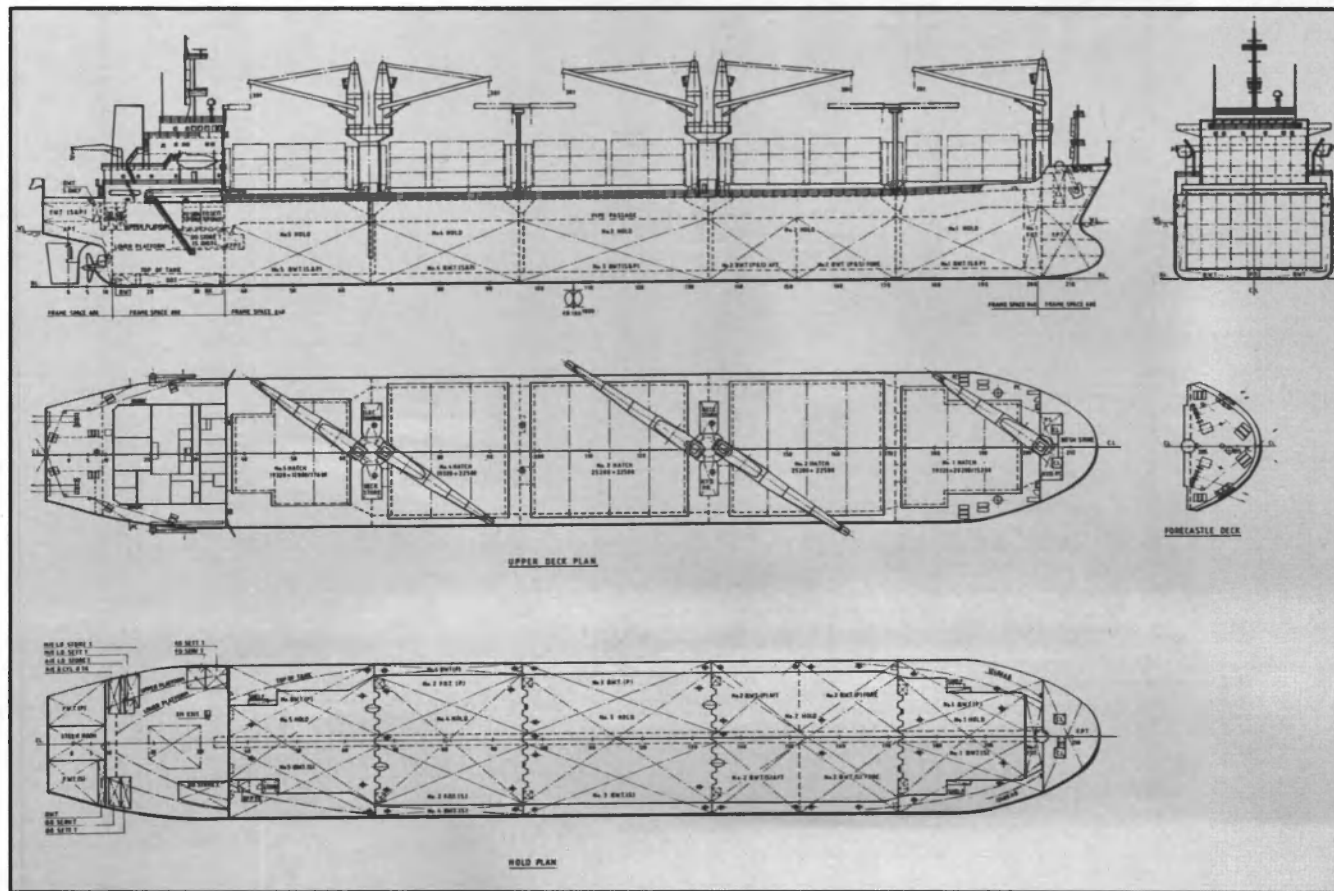
improving container carrying ability. It is already clear from the advanced order situation that there is significant demand in the marketplace for such a class of vessel.

Design Specifics

The *Fantasy* is an open, multi-purpose geared dry cargo container and self trimming dry bulk carrier. It measures 594 ft. (181 m) long with a beam of 85-ft. (26 m). Construction is to American Bureau of Shipping's (ABS) standards, classed A1 (E) Multi-purpose Dry Cargo/Container Carrier, Strengthened for heavy cargoes. In addition, *Fantasy* meets all national and international maritime regulations as applicable to a vessel of its size and type.

A detailed analysis of the hull structure has been carried out using finite element techniques as part of the ABS DLA (Dynamic Loading Approach) program. The ABS SafeHull program has also been used as part of the structural analysis. In form, the hull is conventional, with five holds forward of the bridge/machinery block. It incorporates a bulbous bow and openwater transom stern. Construction includes a double hull to comply with future requirements for ballast handling in restricted waters. To eliminate the carriage of ballast water in the cargo holds, ballast capacity of 10,900-cu.-m. is provided. In addition, the double hull ensures the holds are as rectangular as required for the carriage of containers. Grain and bale capacity are 36,311 and 35,452-cu.-m. respectively.

One unusual feature of the hull is the fitting of a wake equalizing duct, designed and patented by the Shanghai Ship Research Institute for reducing end vibration and for save energy. Testing of the device, in conjunction with a stern bulb, indicated energy savings of four to six percent. In practice, trials of *Clipper Fantasy*, which does not incorporate a stern bulb, returned energy savings of a similar level. Each of the five holds is closed by flat-topped, double-skin, hydraulically operated folding steel hatch covers, designed by the Marine Equipment Division of Nakata Mac Corp. For cargo handling, five



Libherr pedestal electro-hydraulic deck cranes are provided.

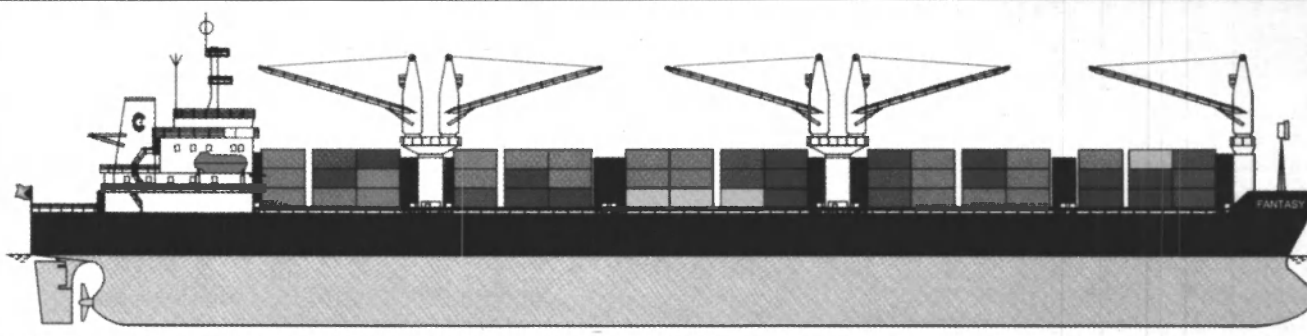
Much emphasis in the Fantasy design has been placed on container capability, and up to 1,130 TEUs are accommodated above and below deck, including 12 reefer units. Below deck stowage is in five tiers for a capacity of 680 TEUs. All containers are secured with Peck & Hale lashing arrangements. Ship load planning and evaluation is carried out on an HEC Cargomax Loading Instrument, supplied by Pacrim Martec Co. of San Francisco. Operating in Windows, it calculates basic ship stability and strength, damage stability, grain stability, tank ullage conversion, container entry with bay plan, container lashing and hull deflection.

All the holds are equipped with a smoke detection system from Unitor Ship Services, which also supplied a CO2 fire extinguishing system for the engine room and holds. Other safety equipment includes two fully enclosed, 25-person lifeboats built by the Beihai Shipyard — one of which is designated as a rescue boat — and one six-person and two 25-person inflatable liferafts. The lifeboat davits have been supplied by the Zhenjiang Marine Auxiliary Machinery Works.

Propulsion for *Clipper Fantasy* comes from a Dalian-built MAN B&W 5S50MC, producing 5,760 kW at 115.9 rpm service rating (6,400 kW at 120 rpm maximum continuous rating). This powerplant drives a four-bladed propeller for a fully laden service speed of 14 knots with a daily fuel consumption of 23.5 tons. Total bunker capacity of 1,300-cu.-m gives the ship an endurance of approximately 16,000 nm.

A shaft generator rated at 500-kW provides power when the main engine is running between 84 and 128 rpm. Additional electrical load is met by two diesel generator sets, each consisting of a Yanmar M200L-EN six-cylinder diesel rated at 552-kW at 720 rpm, and driving a Taiyo 500-kW/450 kVA alternator. The advantage of this arrangement is that during the voyage, power is produced by the low operating cost main engine and running time, hence maintenance costs, of the auxiliary sets, is greatly reduced. On board steam requirements are met by a Friedrich und Karl Bay composite boiler with MDO oil and exhaust gas firing.

Alfa Laval supplied the fuel treatment equipment, a system which includes two heavy fuel oil purifiers, one marine diesel oil purifier, a main engine lube oil purifier and filter and duplex fuel oil filter. The Fantasy design incorporates 28 pumps supplied by the Naniwa Pump Mfg. Co. Ltd. Other engine room machinery installed includes: a Taiyo USC-50 R.C. oily water separator; a Taiyomodel SBT-25 sewage treat-



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EUROPEAN UPDATE

ment plant; flowmeter systems from Mar-In Controls B.V.; and a Sunflame incinerator model OSV-30SA unit rated at 300,000 kCal/h. The hydraulic steering gear fitted is from Porsgrunn Steering Gear AS, produced in Norway. The specific model fitted is designated 425-80/2 and has an effective torque of

760 kNm at 60 bars working pressure.

Clipper Fantasy is outfitted with all requisite safety, navigation and communications equipment including INMARSAT B and C, and a full GMDSS outfit. The bridge is configured for One-Man Bridge Operation (OMBO) with a

large console across the front containing the main navigation and machinery control instrumentation.

The radar outfit has been supplied by Kelvin Hughes, and comprises a pair of Nucleus 2 series 6000 units -- one an ARPA display and the other a true motion dis-

play. Both have full color displays and, for ease of use, are operated by a single trackball and three buttons. Additional navigation and communications systems include: a JRC model JLR-6000MKz GPS navigation receiver; Sperry magnetic compass, gyrocompass and adaptive digital gyropilot; JRC MF/HF radio; an INMARSAT C station; and two VHF radio telephones.

ABB supplied the INMARSAT B station, fax and telex terminals, and OKI supplied the vessel's the internal telephone system.

The fourth Fantasy class vessel is scheduled to be delivered to German owners this October. The remainder of the delivery program currently runs through to April 1998, when the tenth vessel should be ready. Negotiations are reported to be underway.

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Supply ship sisters evoke memories

Recent activities on Scotland's River Clyde, once the heart of a prosperous U.K. shipbuilding industry, brought back memories of former glory when two new platform supply vessels were launched within a few days of each other.

Stirling Forth was first to enter the water, launched from the famous Govan yard, which is now part of the Kvaerner Group. This was followed by the launch of its sistership *Stirling Clyde*, at the Port Glasgow yard of Ferguson Shipbuilders, just a few miles downriver. The vessels were designed by Norwegian naval architects Vik and Sandvik in consultation with owner Stirling Shipping, and are identical 272 x 62.3-ft. (82.9 x 19-m) vessels valued at \$38 million. Following a scheduled July delivery, both ships will begin a five-year charter with Shell U.K. Exploration and Production, the operator for both Shell and Esso in the U.K. sector of the North Sea.

Although the ships are fairly conventional for supply vessels in terms of layout and configuration, the twin vessels will, according to the owner, be among the largest and most sophisticated to operate in the region. The dynamic positioning system and a comprehensive array of thrusters from Brunvoll are designed to make the vessels easy to maneuver and handle. Three 746-kW tunnel stern thrusters, one at the bow and two at the stern, and an 895-kW azimuthing thruster are provided, as well as a Simrad Albatross

ADP700 dynamic positioning system, complete with joystick control. This system will interface to a fan beam laser and DGPS reference systems.

The engines -- a pair of 2,460-kW Wartsila 6R32E diesels -- are located well forward under the aft superstructure bulkhead, with long shafts running to the Wartsila gearboxes and Leroy Somer shaft alternators situated right aft. These engines turn 11.2-ft. (3.4-m) diameter controllable pitch propellers, giving a service speed of 12 knots and a maximum of about 14 knots. Two Cummins diesel powered generators are also provided, and the azimuthing thruster at the bow has its own dedicated Cummins driven alternator. The forward port quarter of the engine room contains a workshop, and an engine control room with an L-shaped console is centrally located at the rear.

Below the well deck, which measures 185 x 52.5-ft. (56.4 x 16-m), are the mud, brine, drill water, freshwater and fuel oil tanks, together with 14,000-cu.-ft. of dry bulk capacity in eight vertical tanks. Deck machinery, mainly supplied by Ulstein, includes two deepwater winches, two anchor handling winches, a deck crane (3 tons at 12 m) and two tugger winches. Safety equipment includes four Jason's Cradles, a 9-man MOB boat and davit-launched liferafts for 24 persons.

Accommodation for the 12 officers and crew is of a particularly high standard -- in single cabins all with private toilet and shower facilities spread over three decks. Up to 12 "guests" can also be accommodated in three large cabins situated on the main deck. Other facilities include a hospital, large day room with sufficient seating for the entire crew, mess, general office and laundry.

The addition of these two new sisterships will bring Stirling Shipping's offshore fleet to a total of 14 vessels, consolidating the company's position as the largest operator in the U.K. sector.

New facility broadens Dutch yard's scope

The decision by Royal Schelde, the Netherlands' internationally renowned, 120-year old shipyard, to build a brand new shipbuilding facility at Vlissingen-Oost has paid off with its recent delivery of *Captain George*, a 251 x 71.4-ft. (76.6 x 21.8-m) catamaran fast ferry. (Vessels with a beam greater than 68.89 ft (21 m) cannot be built

at Schelde Shipbuilding's main yard in the center of Vlissingen.)

The primary catalyst in deciding to open the new facility was the order from the Royal Netherlands Navy to build a 82-ft. (25-m) wide Amphibious Transport Ship (ATS). Contrastingly, Mr. E.M.M. Bilterijst, Schelde's Marketing

and Sales manager was quoted as saying, "The decrease in contracts to

Captain George was built by the Netherlands Royal Schelde and delivered to Piraeus-based owners Greek Catamaran Lines Maritime Company



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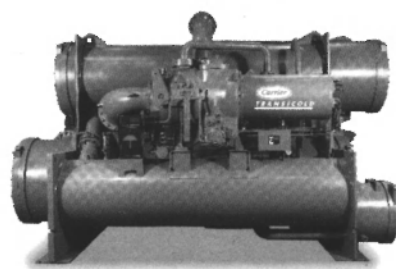
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be expected from the Navy made us decide to aim our efforts at other market segments."

However, the company carried out an analysis of merchant vessels built throughout the world from 1989 to 1994 and found that 68 percent had a maximum beam of between 69 and 93.5 ft. (21 and 28.5 m.). The building of the new construction site became imperative when the company realized that they were precluded from tendering for more than two-thirds of the vessels required.

Built in one of the two huge construction halls at Schelde-East, as the new facility has now

been named, *Captain George* is an aluminum catamaran with four levels above its twin hulls. The vessel has a sleek, streamlined appearance which belies its capacity of 152 cars and 630 passengers.

Propulsion is by four waterjets, two per hull, each driven by a 5,700-kW Caterpillar 3616 DITA diesel engine. This configuration gives the vessel a fully loaded service speed in excess of 36 knots at design condition. Fully laden and with 41 tons of fuel, the endurance at service speed is approximately 300 nm.

The main passenger deck is located immedi-

ately above the two car decks and is divided into two tourist class lounges with a total of 480 seats, and a club class lounge accommodating 100. An additional 40 first class passengers can be seated in an atrium on the aft of the bridge deck.

Captain George has been delivered to Piraeus-based owners Greek Catamaran Lines Maritime Company, and will be in regular service linking Italy and Greece in time for the peak summer traffic.






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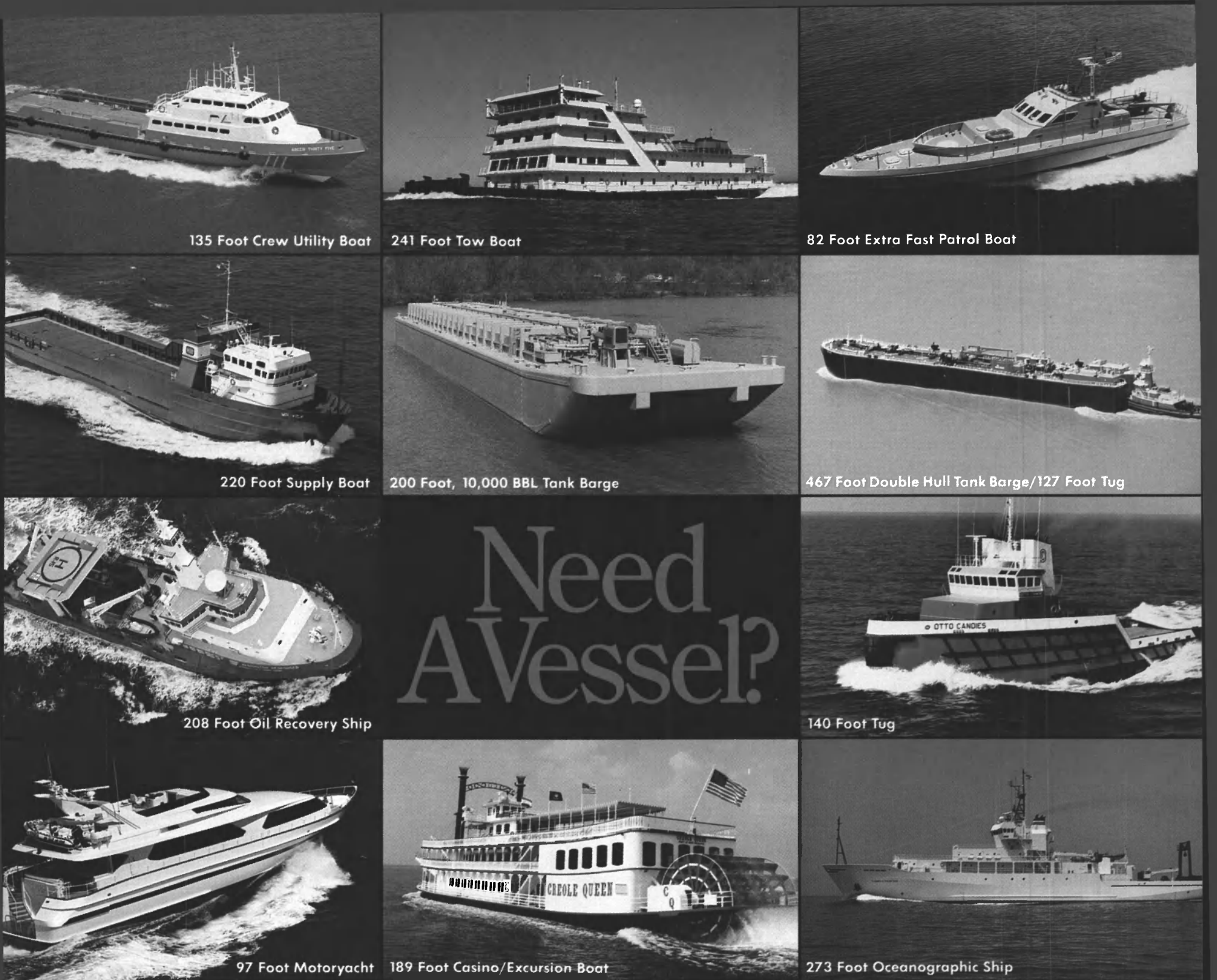
High tech equipment from Japanese-based steelmaker and diversified engineering company NKK Corp. is transforming Kawasaki Port from a purely industrial facility to an international commercial port that is expected to meet the containerized distribution needs of the next century, according to a spokesperson from NKK, which supplied all the core equipment and automated terminal operations systems under a full turnkey project. The first phase of construction of the Kawasaki Port Container Terminal has been completed, and the facility can handle vessels up to 50,000 dwt with a 46 ft. (14 m) deep berth.

Considered an innovative breakthrough in Japan's port facilities, the container terminal employs two giant dual-trolley container cranes, and eight rail-mounted gantry (RMG) cranes linked to NKK-ACTS automated container terminal operation system. These were all supplied by NKK Steel Structure & Machinery Division, as part of the \$60 million contract. The facility, based on a reclaimed island adjacent to NKK's Ohgishima steel complex, operates 24 hours a day, 365 days a year. According to an NKK spokesperson, the NKK-ACTS computer system incorporates a number of high-tech information processing systems including loading/unloading scheduling, container storage control, optimum handling instruction, reefer-container monitoring and EDI (electronic data interchange) outside telecommunication systems.

The second phase will add three container cranes and six RMG cranes. When the second phase of the project is complete, scheduled in 2001, the facility will accommodate 80,000 dwt vessels.

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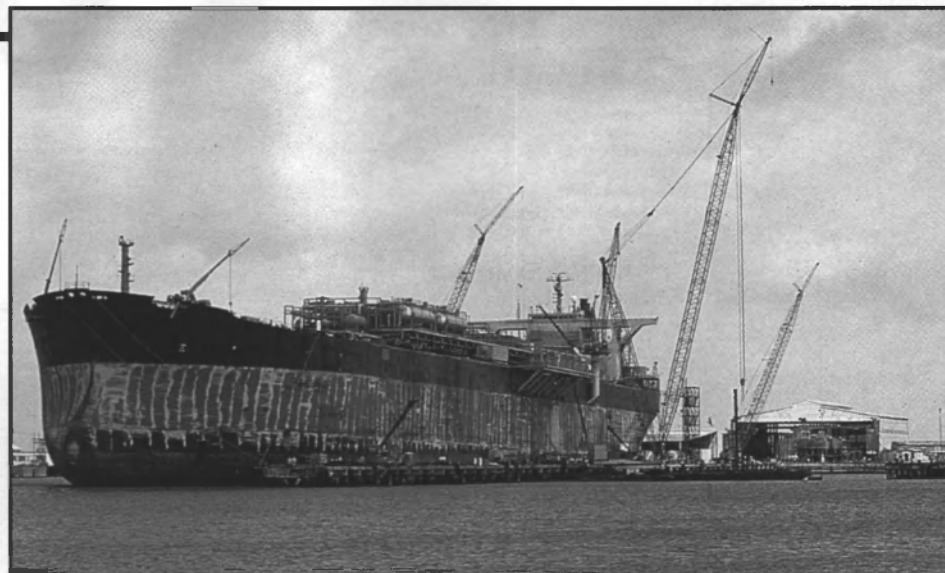
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Oceaneering Completes FPSO Conversion

A 268,000-dwt crude oil tanker was converted to a floating production, storage and offloading system (FPSO), named *Zafiro Producer*, by Oceaneering International. Oceaneering purchased the vessel from Mobil, and Mobil will lease the completed FPSO from Oceaneering for processing up to 80,000 barrels of crude oil per day at the Zafiro field, which is offshore Bioko Island, Equatorial Guinea.

The vessel — which will have a storage capacity of 1.2 million barrels of crude oil — was originally the *MT Swift*, built in Japan by Mitsui at the Tamano shipyard in 1973 for a Japanese owner.

Following its purchase by Oceaneering, the vessel was taken to PMB/Bechtel Pelican Island Facility (the former Todd Shipyard) in



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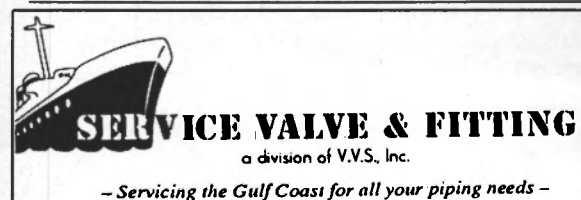
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Galveston, Texas, where the repairs and principal conversion work was performed afloat. The vessel was to have sailed no later than June 21 for Europe, where it was to be dry-docked at a Portuguese shipyard for shell plate repairs, hull coating and final ABS-class inspection. The schedule calls for the vessel to move onto West Africa from Portugal, and it is to be installed at the Zafiro field by mid-August.

Some highlights of the conversion include:

- At 268,000 dwt, *Zafiro Producer* will be the second largest vessel ever converted to an FPSO when it enters production service;
- The 80,000/bpd, 40-mmscf production process system is one of the largest yet installed aboard an FPSO; and
- The vessel will be installed in a water depth of 600 ft. (182.8 m), reportedly the greatest depth to date for a spread-moored FPSO, and the greatest depth for a floating production system offshore West Africa.

For more information on Oceaneering
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NOTE: For more information on this innovative conversion, please see the Ship & Boatbuilding Technology section of MR/EN's August 1996 edition.

MES Delivers Bulk Carrier Forward 3



The 46,678-dwt bulk carrier *Forward 3* (Hull No. 1426), built at the Tamano Works of Mitsui Engineering & Shipbuilding Co., Ltd. (MES), has been completed and delivered to its owner Mi-Das Line SA. *Forward 3* is a medium-sized bulk carrier with five cargo holds and four cranes all together.

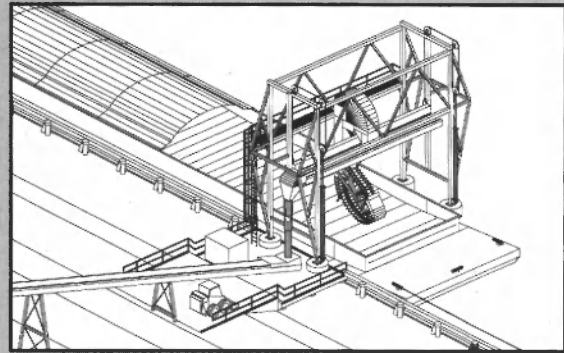
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Forward 3 Particulars

Length o.a.	622.7 ft. (189.8 m)
Length b.p.	593.8 ft. (181 m)
Breadth (molded)	101.7 ft. (31 m)
Depth (molded)	54.1 ft. (16.5 m)
Draft (molded)	38 ft. (11.6 m)
DWT	46,678
Main engine	Mitsui-MAN B&W 6550MC diesel
Classification	NK
Flag	Panama

Maritime Reporter/Engineering News

**Continuous Barge Unloader Offered
By Timstar**



Timstar Barge Unloader Model SB-750 is shown mounted on pylons.

Timstar's bucket chain technology for continuous ship unloaders is now available for barge unloading. This high-speed chain technology reportedly allows inexpensive equipment that is small in size.

The Timstar Barge Unloader Model SB-750 reportedly handles 750 tons per hour in free-flowing, abrasive cargo of any density. It is available in either a fixed or gantry design and mounts on pylons or floating barges.

Each Timstar unit is custom-built to meet customer needs.

The Timstar Barge Unloader reportedly offers flexibility in capacity and mobility, and additional units may be added to increase capacity. Timstar also offers self-unloaders, ocean-going barge unloaders and Panamax ship unloaders.

For more information on Timstar
Circle 71 on Reader Service Card

**Bay Fabrication Renovates Ferry
Grand Isle**



Bay Fabrication, Inc. of Panama City, Fla. has delivered the double-ended ferry *Grand Isle* to Lake Champlain Transportation Co. Inc. of Burlington, Vt., after an extensive refurbishment program which included the addition of a 38.6 ft. (11.7 m) midbody section. *Grand Isle* was built in 1953 at Tampa Marine Co. with overall dimensions of 137.6 x 43 x 11.6 ft. (42 x 13.1 x 3.5 m), and has operated throughout the years on Lake Champlain, operating year-round, or at least until the ice became too thick for operation.

Due partly to *Grand Isle's* age and Lake Champlain's Transportation Co.'s purchase of three new and larger vessels over the past few years, the operating time of *Grand Isle* has been substantially reduced. The owners had to make a decision whether to sell or refurbish the vessel to modern standards. After opting for revamping, Bay Fabrication was chosen for the work. The 176 x 43 x 11.6 (53.6 x 13.1 x 3.5 m) modified *Grand Isle* can now accommodate five semi-tractor units in addition to several

smaller trucks, or 40 automobiles with no trucks. Passenger capacity has been raised from 130 to 200. Design work for the vessel's modernization was provided by John W. Gilbert Associates, Inc. of Boston.

For more information on Bay Fabrication
Circle 69 on Reader Service Card

**Elf Floating Production Unit Ready To
Leave For Nkossa Field**



French petroleum company Elf Aquitaine's 721-ft. (219.7-m) floating production unit left the port of Fos-sur-Mer on the Mediterranean coast of France on March 16 for a voyage of approximately six weeks, to its Nkossa oil field. Located 37 miles off the coast of Congo, West Africa, Nkossa is reportedly the deepest offshore development yet undertaken in the Gulf of Guinea in West Africa, the largest operated by Elf Congo, and one of the most important carried out by Elf Aquitaine.

The pre-stressed concrete barge is reportedly

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the largest of its type to be built. Placed on it are size modules which form an entire production unit weighing 11,000 metric tons. The modules are used for accommodation and central control, utilities, electricity generation, compression of gas for re-injection, crude oil treatment and liquid petroleum gas production.

The Nkossa field was discovered by Elf Congo on the exploration permit called Haute Mer in 1984.

It is located 9,800 ft. (2,987 m) under the sea floor in a water depth which varies from 500 to 1,000 ft. (152.4 to 304.8 m). Production of a high quality oil comparable to Brent crude will begin this year, and is estimated to continue for 30 years. The production plateau will reach 120,000 barrels per day.

Partners in the Nkossa field and Haute Mer license are Elf Congo (operator) at 51 percent, Chevron

Overseas (Congo) Ltd. at 30 percent, Hydro-Congo at 15 percent and Engen Exploration (Congo) Ltd. at four percent.

Alfa Laval Control Systems Receive Certification

The control systems SattCon 05, SattCon OP45 and SattCon 200

from Alfa Laval Automation have been certified by Det Norske Veritas in compliance with the organization's rules for classification of ships and mobile offshore units. SattCon 200 is a programmable logical controller (PLC) for medium to large applications — from 200 inputs and outputs (I/O) to more than 2,000 I/Os. Since SattCon is built up in flexible modules which use a remotely distributed I/O architecture, it is suitable for marine applications. SattCon 05 is also a modular PLC, but it is more suitable for smaller applications.

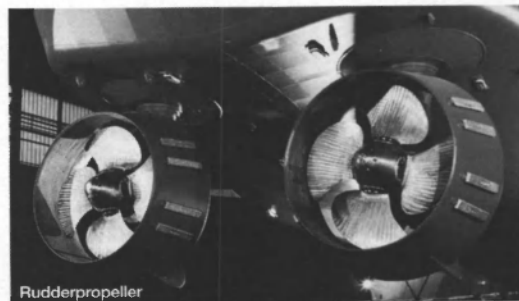
Both control systems offer multifunctionality, since they use PID loops, text and alarm handling, supervision functions and various necessary communication solutions.

The operator panel SattCon OP45 is a system which integrates the operators' display and keyboard in one unit. SattCon OP45 is suitable for smaller control tasks, including operator functions in a distributed configuration such as needed onboard ships.

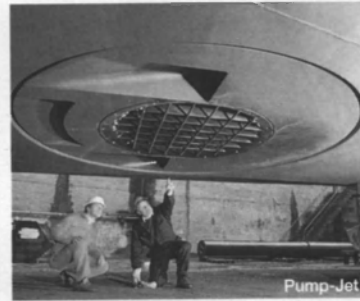
SattCon 200 has a wide range of CPUs which increases its flexibility. The fast remote I/O and integrated terminals also save installation costs. Maintenance is facilitated by I/O fault detection and faulty I/O modules detection.

For more information on Alfa Laval
Circle 16 on Reader Service Card

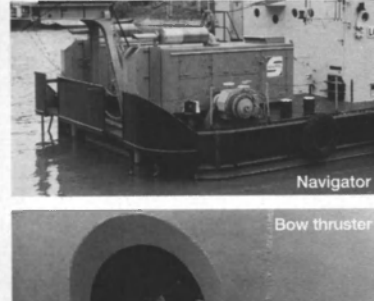
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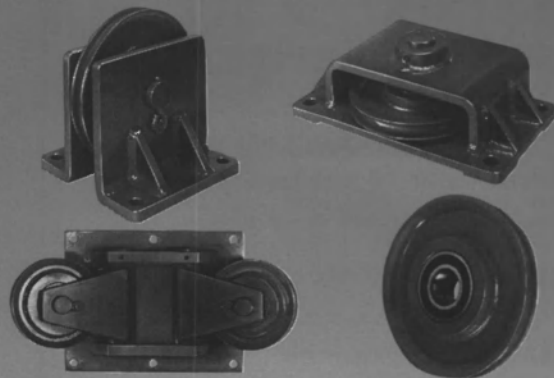
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Engineering Research Overhaul Announced

The Australian Maritime Engineering Cooperative Research Center (AMERC) has announced a major restructuring of its research program aimed at capturing new opportunities for Australia in a sector with enormous growth potential. Announced by Chairman Dr. Don Williams at AMERC '96, the first annual meeting of all researchers and participants of AMERC at the Launceston (Tasmania) headquarters, the restructuring signals a new direction in Australia's already internationally recognized maritime engineering sector. The new research program will encompass all forms of ships, structures for offshore oil and gas activities, as well as fisheries technologies. The first major initiative will be an extensive market evaluation to quantify opportunities from the ocean for Australia. "We have already built a strong research resource to tackle industry's research problems and we are continually attracting some of the country's leading companies as participants in our research program," said Dr. Williams. "What we are aiming for now is to turn our efforts toward capitalizing on new opportunities presented to us, and the bottom line is to ensure that research results are quickly translated into practical use by the Australian industry."

Pool Energy Makes Several Offshore Investments

Pool Energy Services Co. announced letters of intent for two international transactions. It entered into a letter of intent to acquire the 51 percent interest (that it does not already own) in its Malaysia joint venture, Antah Drilling Sdn. Bhd. Antah Drilling's assets include a state-of-the-art, 2,000-hp platform drilling rig and a platform workover rig. The platform drilling rig is scheduled to commence operations offshore Australia in the third quarter of 1996 for Esso Australia Ltd. under a three-year contract. The platform workover rig is currently working offshore Malaysia for Esso Production Malaysia Inc.

The company has also entered into a letter of intent to acquire a 51 percent interest in a newly formed Argentinian corporation that will own and operate nine land drilling rigs and 11 land workover rigs. The two transactions are subject to, among other things, the negotiation of definitive agreements.

"In addition to the scheduled commencement of operation of a 2,000-hp platform drilling rig in the Gulf of Mexico in the third quarter of this year, the recently announced agreement to acquire the operating assets of Western Oil Well Service Co., and the recently consummated purchase of our partner's interest in Pool Santana Limited, the transactions announced should also enhance the company's results in the future," said **Jim Jongbloed**, chairman, president and CEO.

Company Initiates Cruise Operation Between California And Mexico

International Basic Resources, Inc.'s subsidiary, Ensenada Cruiseport Village, S.A. de C.V., has entered into a memorandum of understanding with Piscadera Management Co. N.V. for the commencement of daily cruise ship service between San Diego and Ensenada, Baja California, Mexico.

Piscadera, a Netherlands Antilles company with hotel and gaming operations in Curacao, has concluded negotiations to charter its first cruise ship and expects to begin daily service between San Diego and Ensenada on August 1, 1996. The ship's activities will include gaming as well as food and beverage service.

Ensenada Cruiseport Village has received the approval of the Ensenada Port Authority for a conceptual master plan for a cruiseport village in Ensenada, designed to simultaneously accommodate four of the largest cruise ships.

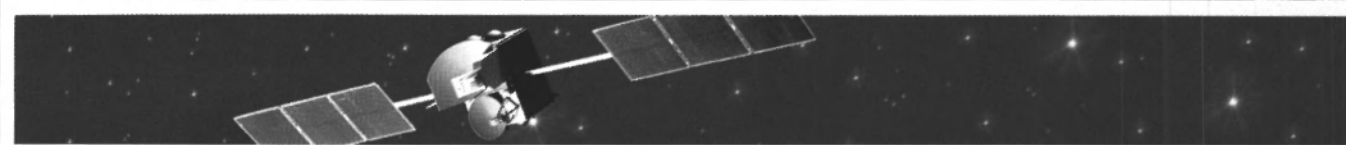
The daily cruise service is expected to generate at least 340 port calls per year at Cruiseport Ensenada.

Ensenada Cruiseport Village, S.A. de C.V. has agreed to enter into the five-year agreement with Piscadera Management Co., N.V. for joint promotional activities for the daily service and passenger activities during Cruiseport Ensenada port calls, in addition to the daily cruise service.

Steamers' Charters Latest Containership

Steamers Maritime Holdings Limited has chartered its latest containership to Swiss-based main line operator Norasia. The 605-TEU *Rajah Brooke* will be plying in the Arabian Gulf during the one-year charter, which was scheduled to commence in June. Classed by Germanischer Lloyd, *Rajah Brooke*

is equipped with two 40-MT cranes and 50 reefer points for refrigerated containers. The 7,800-dwt ship, capable of a speed of 16.5 knots, has three cargo holds fitted with foldable hatch covers. *Rajah Brooke* is the first in a series of vessels ordered by Steamers in its new initiative to invest in container feeder ships. The company has an additional eight container vessels under construction for delivery in 1997 and 1998.



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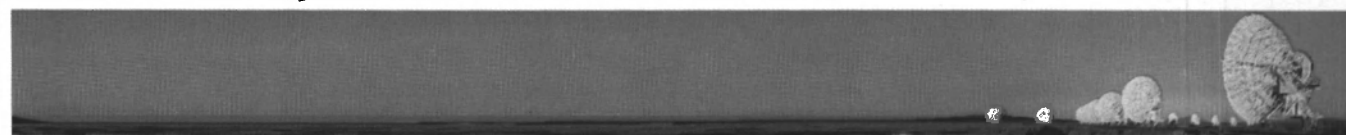


The passion for the sea drives men to sailing; it's better to know that one can rely on safe communication links with shore stations, with other vessels, with the various units of the fleet. TELECOM ITALIA, the company which operates telecommunications in Italy, now also manages services previously provided by SIRM, concerning maritime radio links and assistance to navigation, guaranteeing communications and radio traffic, also via satellite. TELECOM ITALIA's offer for the sea further includes sale, installation, maintenance and service for equipment and integrated navigation systems, all complying with the most recent national and international regulations and projected according to the most advanced technologies. Now, merchant ships, fishing boats and pleasure crafts have something new in common: TELECOM ITALIA's security in maritime communications.

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Knot So Fast

Today's focus in the shipping world is increasingly on fast ships. However, the trend is also towards higher speeds for conventional tonnage — vessels such as containerships, RoRos and bulkers. And while the speed increases are only up to five knots, this has important implications and is a challenge for the ship designer. To ensure stability, safety and performance criteria are met, it is important to identify and solve problems during the design process.

Fuel costs, of course, is a very important factor which directly affects the speed of ships, but the focus on fuel cost varies.

For example, the general thought in the 1960s and early 1970s was to increase ship speeds, with the consequent higher power demands and higher fuel consumption.

This trend was abruptly broken with the oil crisis in 1973, and as a result, speeds were reduced, sometimes drastically, to decrease fuel costs.

The next trend to increase speeds started in the late 80s.

The Need For Speed

Towards the end of the 1980s, a change was noted, as several projects were initiated, specifying fast transport. While the projects mainly involved ferries, it was notable that plans called for ships of 1,000 dwt and larger at speeds of 35 knots and above. At the same time, a demand for higher speeds in the RoRo and container-ship segments was discovered, and the typical speed increase raised services speeds to around 25 knots.

Speed Affects Design

The development of hull lines is mainly an evolutionary process where the requirements of the cargo and cargo handling are important. The design of the hull lines has to be, in general, completed within a short time frame, and is concerned with the actual ship. In depth optimizations are rarely made, but rather refinements and extension of existing designers. A speed increase from 20 to 25 knots has implications not only on fuel consumption, but also on

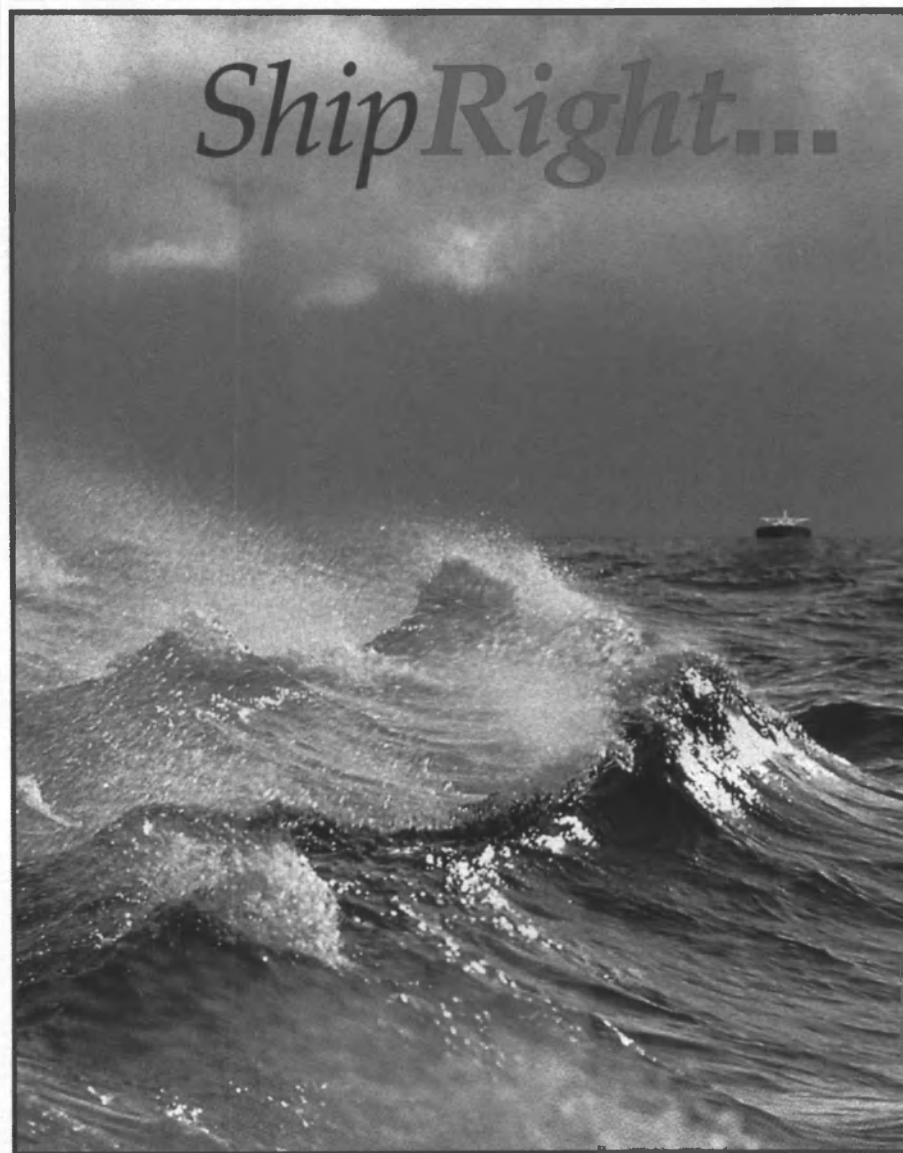
vibration and noise levels, sea loads and to some extent on maneuvering properties. This implies that a more careful and systematic design procedure is needed.

Speed-power relation and the choice of the optimal dimensions should be considered at the outset of the project. While experience and data bases exist to help make correct choices, these resources need to be complemented, as modern ship forms imply dimensional relations outside earlier experiences.

Another area of concern with increasing speeds is that of noise and vibration. With ship speeds increasing, vibration problems have seemed to reappear, despite improved methods to predict vibration and noise. It should also be noted that the common hull shapes with rather flat aftbodies appear to be more susceptible to pressure pulses.

Design Tools

In the past, the main tools for the hydrodynamic design of ships were model tests and



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CAD/CAM

experience. The model tests were, in general, quite time consuming and focused on the speed-power relation. The limited time for the design also meant that the design goal generally was to provide a satisfying solution rather than an optimized design.

The availability of computational methods as Computational Fluid Dynamics (CFD) for resistance and propulsion, time simulation of ship's motions, finite element analyses of vibrations and noises, etc., provide possibilities to investigate the relative merits of different design alternatives within a limited time frame. In this way, different design concepts can be analyzed with regard to speed-power, vibrations, sea loads and other aspects almost simultaneously. However, to obtain a high assurance of the project, model tests are recommended to verify the computational results.

The Future

The demands on sea transport will focus more and more on competitiveness, safety and environmental aspects. Competitiveness means not only low fuel consumption, but also low sea loads, good maneuverability and low vibration and noise levels. Ships which do not comply with basic regulations and requirements in regard to complying with safety and environmental demands will not be accepted, and it can be anticipated that such demands will only increase. Future ships will require larger design efforts and will consequently demand efficient and reliable design procedures. In regard to ship hydrodynamics and related fields, the development of computational tools will continue, and such methods will be used more. Most aspects of ship hydrodynamics — which earlier relied on model test results — can now be treated computationally, primarily for comparisons and optimization of the designs. With more extensive use of computational methods, improvements in performance seem to be possible. As an example, CFD calculations have been used in an optimization test on resistance, and the results indicate reductions in the order of 10 percent. Model tests will still be required to verify and validate computational results. Design work will thus include both computational work and model tests.

The preceding article was excerpted from an article authored by Willem B. van Berlekom, senior vice president, and Bjorn Allenstrom, vice president ship design development, of SSPA Maritime Consulting AB (Goteborg, Sweden)

Autoship Releases Autoship 6

Autoship 6 is now shipping, and the manufacturer claims it sets new standards in hull design software, offering an array of technical

and ease-of-use improvements. Autoship 6 includes a new high quality Z-Buffer rendering, which offers Gouraud shading, accurate hidden surface removal, up to 10 light sources and material properties allowing simulation of dull or shiny materials of any color.

Approaching photorealistic, the rendering is reportedly good enough for presentations. Autoship also reports it is six to 10 times faster than the flat shaded rendering in Autoship 5.

For more information on Autoship 6 Circle 112 on Reader Service Card

Improve Delivery Time and Cost for ship production...

Users of TRIBON have reported major improvements in delivery time and costs for ship production.

For example, one major European shipyard has improved order to delivery time to 18 months for a first of class feeder container ship and 7 months for ships in a series.

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From Initial Design to Production

TRIBON is a design and information system created to fit the specific business needs of the shipbuilding industry. TRIBON applications cover the complete process from initial design to generation of production information so data need only be entered once.

TRIBON is an Expert system

Shipbuilding knowledge accumulated over 25 years is implemented in TRIBON. This means that the system allows designers to be extremely productive creating designs. In addition TRIBON has customisable standards which allow a customer to build in the rules that are used in production at his own site so that designs are tailored to use the available production facilities in the most economical way.

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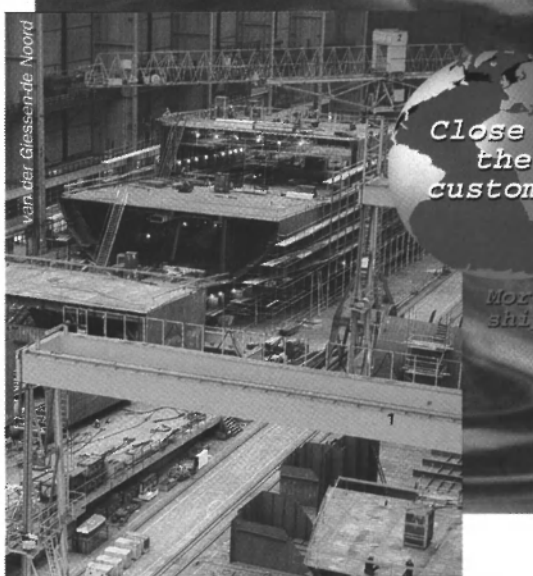
The core of the TRIBON system is the Product Information Model which is used to integrate all stages and disciplines of design and build strategy work and make them concurrently available to all designers and planners. This shortens the overall process by allowing different types of designers and planners to work in parallel.

Automatic Production Information

TRIBON will automatically generate production information for a design in accordance with the build strategy and the customisable shipbuilding expertise built into the system.

The types of machinery supported by TRIBON are constantly expanding with improvements in shipyard facilities and robot technology. KCS is heavily involved in a series of yard modernisation projects in Europe, Korea, and Japan where the use of TRIBON is critical to control new equipment being installed and gaining cost savings in production.

with the TRIBON Shipbuilding system



KCS operates worldwide. We place a high importance on continuing support of our customers, so to complement the support services of our head office in Sweden, KCS local offices have been established in China, Germany, Japan, Russia, South Korea, Singapore, UK and USA.

More than a third of world shipbuilding orderbook

Design and information systems from KCS are in service at more than 230 shipbuilders and design engineers offices all over the world. Today these companies carry out the design and production for more than a third of all ships in the complete world shipbuilding orderbook. This large base of customers are continually creating new ideas and projects to improve the TRIBON system.

The KCS Family Concept

The TRIBON system is developed in close cooperation with our customers in what we call the KCS Family Concept. The Family Concept is a framework for communicating and working together with our customers. Ideas and plans are exchanged regularly in a number different forum such as Partner Meetings, Reference Groups, Workshops, and Users Meetings. For example, Users Meetings are organised once a year to give customers from all over the world the chance to get together and discuss system development and improvement. At the 1995 meeting there were 205 customers from 26 countries.

Please send me further information about TRIBON Shipbuilding system.

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CAD/CAM

New 3D Geometry Engine Solid Modeller Introduced

Denab Robotics now offers a Parasolid-based option to its simulation software products which reportedly gives engineers advanced solid modelling capabilities and the tools for an effective integration into engineering applications. The major benefit of this capability to the Deneb software is direct access to Parasolid CAD part files with zero data loss from the Deneb simulation environment. Since there is no longer a need to translate large CAD files each time there is a revision, users will see at least a 50 percent reduction in model building time. Overall, the Deneb Parasolid capability will decrease data acquisition time by approximately 80 to 90 percent, helping to bring engineering and manufacturing closer together in a true simultaneous engineering environment.

For more information from Denab
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KCS' Tribon Chosen By Korean, Ukraine Yards

Hyundai Heavy Industries, special & naval shipbuilding division, has purchased the hull, work preparation and the complete outfitting application of the Tribon system. Also, 61 Communards Shipyard, a commercial and naval shipbuilder in Nikolaev, Ukraine, has bought the hull and complete outfitting applications of the Tribon System. Tribon — from Kockums Computer Systems (KCS) — is an integrated design and information system which covers all aspects of design from initial design to production. Design and information systems from KCS are in service at more than 250 shipbuilders and design engineering offices around the world.

For more information from KCS
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Astilleros Españoles, Sener Forge Agreement

Spanish state-owned shipbuilding group Division de Construcción Naval (DCN) has signed a license agreement with Senermar, the Spanish firm of naval architects, for the use of Foran 30, CAD/CAM/CAE systems for ship design and production as well as an agreement for technical collaboration. All DCN yards — Astilleros Espanoles (AES) Astano H.J. Barreras, Juliana Constructora Gijonesa, Astilleros Y Talleres De Santander (Astander) and the diesel engine factory Manises Diesel Engine — devoted to new-

buildings have been using the Foran general design package since 1993 to carry out tender designs and final stability calculations. It is the first time that AESA has opted for the full Foran V30 system. Two years ago, DCN considered the strategic need for a

change in its CAD/CAM/CAE tools. In February 1996, DCN and Sener started discussing the contract, which covers not only the license to use the entire Foran system, but also a technical collaboration agreement to jointly undertake new developments and give fresh

technological impetus to DCN through the use of the Foran system. In the short and medium term, Sener and DCN will be working specifically in the area of robotics, assessment of tasks, production data management and work progress control.

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The Marine Travelift 300 BFM mobile boat hoist is proving itself as a real versatile performer in large boat handling. Originally thought of as a hoist for work boats and commercial fishing boats, the 300 BFM hoist easily meets the challenge of handling today's upsized pleasure craft.

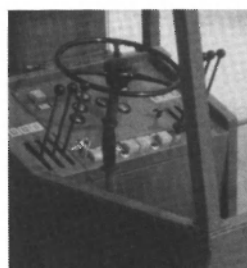
The many design features, which are standard on the 300 BFM hoist, make it easy to handle even the most difficult lifts. The open end design speeds boat loading and unloading, while the beam forward design increases boat clearance for masts and boat bridges.

Two speed hoisting and two speed drive, along with the unit's 90° pivot steering, reduces boat handling time and increases maneuverability, along with boat handling and service opportunities. Our automatic load equaliz-

ing feature provides synchronized sling adjustment and confident boat handling.

The 300 BFM mobile boat hoist features a high strength, low alloy steel super structure with stainless hydraulic tubing for a long, trouble-free service life. Maintenance is easy with low mount, easily accessible power plant and hydraulic compartments.

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Full instrumentation is located in the operator's compartment for travel, steering, hoisting, sling spacing and load controls.



Adjustable sling spacing is hydraulic powered.

potential and outstanding resale value when you decide to increase load capacities.

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KCS Unveils Tribon Dotori Details

Kockums Computer Systems (KCS) recently announced technical details of the new Tribon Dotori module, which has seamlessly integrated into the Tribon system. The feature focuses on reducing worker hours during the assembly and erection phases. The Dotori feature of Tribon is an implementation of NC instructions for a continuously varying bevel angle in fillet welded joints associated with the assembly of adjacent structural components.

Tribon now supports the definition and use of bevelling for fillet welding whenever there is to

be a dependence on the connection angle between the elements involved and/or their material thickness. Dotori can be applied to calculate bevels in many situations, for example, in webs of shell profiles and lugs of cutouts. The Dotori feature automatically generates information to control the angle of the cutting heads with a variation according to rules specified by the customer. The latest cutting machines for both plate and stiffener piece parts have the capability of controlling and changing the angle of the cutting heads.

The user specifies an unrestricted number of instances of complex bevel definitions based on an extended number of basic bevel codes, thus setting up the customer's own preferred standards affecting the design, and which will automatically be used

in production. In doing so, the customer assigns values to a number of parameters (including chamfers, opening angles, nose and/or knees and gaps between the center of the joint and the edge of the plate after preparation) and may in a convenient way specify the rules under which each type will be applied at the various joint types.

Different bevel rules can be set up for different production lines, depending on the types of parts to be processed. In each instance, the connection angles are then automatically calculated from the Tribon Product Information Model; during processing the nominal part geometries are modified in an automatic manner.

KCS is touting Dotori as a means for world class shipbuilders to reduce building time and cost through lower numbers of worker hours in the assembly and the erection processes. It complies with Japanese Quality Standards and improves the accuracy of parts manufacturing. In short, Dotori is designed to:

- ensure a first-time fit of the component

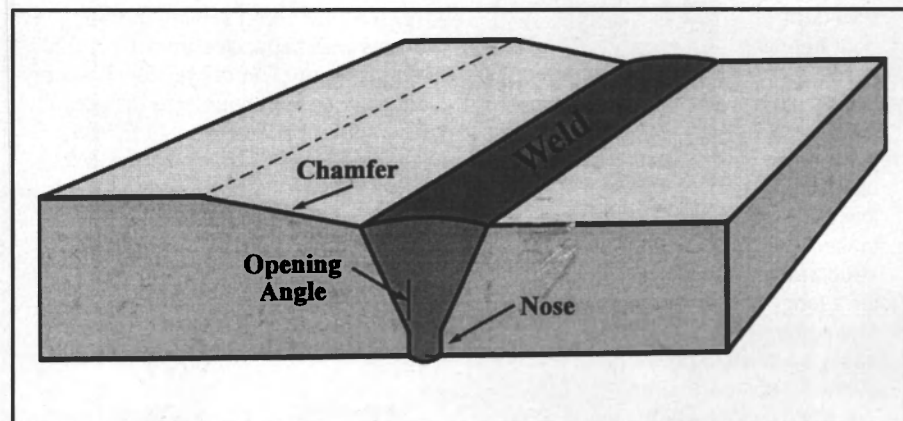
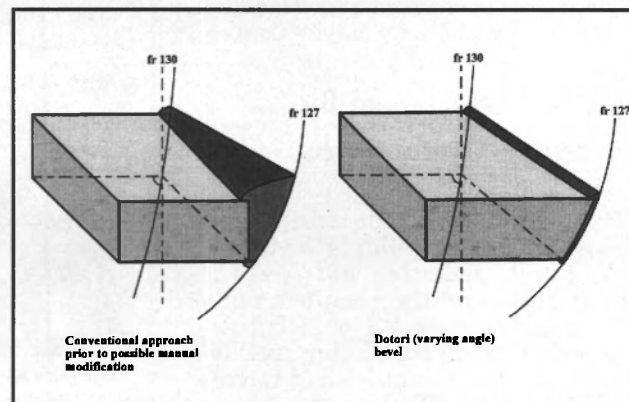


Fig. 1: A butt joint with chamfer.

Fig. 2: Pictured is the difference in fillet welding between a traditional vertically cut plate part and a plate part that is cut to fit the connection angle.



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structural items at all of the assembly, thus contributing to a reduction or complete elimination of excess material;

- offer significantly reduced welding by suitable selection from a greatly increased number of bevel options. For example, minimizing extra machining resulting from chamfers;

- lead to extremely low rework levels because of the reliable, automated process which reduces the possibilities of human error;

- present the true cross-sections of joints; and

- facilitate the output of appropriate bevel notes and boring sketches from the nesting module.

For more information from KCS
Circle 115 on Reader Service Card

Intergraph Upgrades 3-D Mechanical Design And Drafting Software

Intergraph Corp. announced that Solid Edge, the company's new 3-D mechanical design and drafting software, and Imagineer, a 2-D precision drawing program, have been added to the NAVAIR/SPAWAR CAD-2 contract. Solid Edge combines advanced parametric, feature-based, solid modeling tools with the Windows environment. Solid Edge incorporates Object Linking and Embedding for Design and Modeling (OLE D&M) extensions that provide users with the familiar Windows cut-and-paste, drag-and-drop integration when using 3-D mechanical parts and assembly models. Imagineer Technical is a 2-D precision drawing tool that bridges the gap between complicated CAD software and basic drawing packages.

"Both products share the remarkable ease of use provided by leading-edge Windows technologies, making them intuitive in practice and eliminating the need for complex, costly training," said Tom Baybrook, vice president of marketing, Intergraph Federal Systems.

For more information from Intergraph
Circle 116 on Reader Service Card

Griffin Orders New Containership

Durban-based Griffin Shipping Holdings has ordered a 1,728-TEU containership from Poland's Szczecin yard. The 23,000-dwt vessel will be delivered in the second half of 1998. "This ship will fit neatly with our strategic focus on the super feeder sector of the containership market. It will be a sis-

tership to *Quadrant Express*, which we took delivery of last year and which has performed extremely well," said Mike Meehan, managing director of Griffin. The new building order is of the B170-class, and will have a service speed of 19.7 knots. It will be self-sustaining, with three 40-ton cranes. Griffin will manage the ship from its Hong Kong office, and expects to place it on long term charter with a first class liner operator.

"This will bring to four the number of Szczecin-built ships which we own," said Mr. Meehan. "The three we already operate have proven themselves commercially attractive to good charterers, and I am confident that this new vessel will substantially enhance our already growing earnings from containerships."

Mr. Meehan expects the overall cost of the vessel on delivery to be approximately \$310 million, but

the actual contract price is confidential. Financing will be through traditional bank finance, as well as the company's own resources. Griffin holds an additional three options for similar vessels at Szczecin for delivery in 1999.

Griffin Shipping Holdings owns and manages a fleet of multi-purpose vessels, mid-size containerships and handy-size bulk carriers through Hong Kong-based Griffin Shipping (Asia).

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Avondale Delivers Navy Ship; Launches Product/Chemical Carrier

Nearly 12 years of ship construction contracts came to an end in May with the delivery of T-AO 203, USNS *Laramie*, by Avondale Industries, Inc. to the U.S. Navy. *Laramie* was the 16th ship of the T-AO 203 187 class which Avondale has built and delivered since the keel was laid for the first ship of the class, USNS *Henry J. Kaiser* (T-AO 187) in August 1984. These commercial fleet replenishment oilers are operated for the U.S. Navy by the Military Sealift Command.

Laramie, like her sisterships *Rappahannock* and *Patuxent*, was designed and built with dou-

ble hull sides and bottoms to satisfy OPA 90 requirements. The separation between the two hulls is a minimum of 6 ft. (1.8 m) on the sides and 6.5 ft. (2 m) on the bottom. The replenishment oilers measure 677.5 ft. (206.5 m) long, with a beam of 97.5 ft. (29.7 m) and a maximum draft of 36 ft. (10.9 m), and are powered by twin, 10-cylinder, medium-speed diesel engines. Capable of achieving service speeds of 20 knots, the twin-screw propeller design reportedly provides the vessels with improved directional stability, ease of control and mission reliability under combat conditions.



Pictured (l to r): (witnessing) Captain David W. Widdon, U.S. Navy, supervisor of Shipbuilding; Edward Barrett, Military Sealift Command, Ship Introduction program manager; T. Shen, U.S. Naval Sea Systems Command, T-AO project manager. (signing) William E. Watson, Avondale Industries, Inc., T-AO program manager; Captain R.J. Russell, Military Sealift Command, master T-AO 203; and Richard C. Bloom, Military Sealift Command, senior on-site construction representative.

Signing for the delivery were William E. Watson, Avondale Industries, Inc. T-AO program manager; Captain R.J. Russell, Military Sealift Command, master T-AO 203; and Richard C. Bloom, Military Sealift

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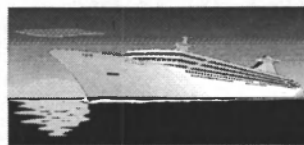
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ITS '96

In early September, Seattle will host an extraordinary, if not unique collection of maritime events. According to Allan Brunton-Reed, the U.K.-based organizer of the 14th International Tug & Salvage Convention and Exhibition (ITS '96), this is more by accident than design, since Superyacht Northwest '96, now in its fourth year, also chose the same time and venue. Since trade space at both exhibitions was sold out at an early stage, the organizers of the separate events decided to join forces and launch Workboat Northwest '96.

All three events will be held during the same week at the new Bell Harbor facility on the waterfront in downtown Seattle. ITS '96 will run from September 9 to 13, and Superyacht Northwest '96 and Workboat Northwest '96 will take place from September 11 to 14. Trade visitors to one event will be given complimentary access to the other two.

Workboat Northwest '96 will be housed in a tented structure on the apron adjacent to the Bell Harbor International Conference Center, and the organizers of ITS '96 have reserved 800 ft. of mooring space alongside the apron so that local tug owners can moor their craft.

Workboat builders exhibiting at Workboat Northwest '96 are also expected to make use of this facility to display their latest vessels. Crowley's *American Salvor*, reportedly the largest salvage vessel on the North American West coast, will also be stationed alongside for the week. The gleaming superyachts will be moored at Bell Harbor Marina.

On the afternoon of September 11, a tug and salvage display/demonstration will take place as part of ITS '96, which is expected to be one of the world's largest gathering of international towage and salvage professionals, with delegates from more than 40 countries.

For more information on Workboat Northwest, contact Kristie Ferguson, 135 Lake St., Ste. 115, Kirkland, WA 98033, tel: (206) 827-3200; fax: (206) 827-7455.

For more information on ITS '96, contact the ITS '96 Secretariat at 19 Bridge Road, Hampton Court, East Molesey, Surrey, KT8 9EU U.K., tel: +44 (0) 181 941 7878; fax: +44 (0) 181 941 8787.

Command, senior on-site construction representative. Witnessing were Captain **David W. Widdon**, U.S. Navy supervisor of Shipbuilding, New Orleans; **Edward Barrett**, Military Sealift Command, Ship Introduction program manager; and **T. Shen**, U.S. Naval Sea Systems Command, T-AO project manager.

In addition, on May 17, Avondale launched the first of four double hull product/chemical carriers for American Heavy Lift Shipping Company (AHL) of New Orleans. Attending the side launching were representatives from AHL, Maritime Administration, American Bureau of Shipping and Avondale.

This marked the first launching of a commercial double hull tanker in the U.S., designed and con-

structed to comply with OPA 90 requirements.

Immediately after the launching, the double hull forebody was floated into Avondale's 20,000-ton drydock for joining to an AHL existing stern from which the existing forebody had been removed. Extensive enhancements are also being made to the existing stern. The completed AHL product/chemical carrier is scheduled for delivery this

September. This will be the first commercial ship delivered by Avondale since 1984.

For more information on Avondale
Circle 70 on Reader Service Card



Pictured is the launching of the first of four double hull product/chemical carriers to be built by Avondale for AHL.

Stena Line Installs Windows-Based ECS On Fast Catamaran Ferries



Stena Lynx II is shown approaching Clais harbor.

Ferry operator Stena Line has installed PC Maritime's Electronic Chart System (ECS) Navmaster Professional, with U.K. Hydrographic Office ARCS charts, aboard its high-speed catamaran ferry *Stena Lynx II*. Sistership *Stena Lynx I* is the next ferry scheduled to have Navmaster onboard.

"There's no forward view for passengers, only side windows," explained Captain **Roger Emmins** of *Stena Lynx II*. "So the bridge display showing *Stena Lynx II*'s track is 'piped' through to video screens in the cabins, allowing passengers to follow our route as it's plotted on the chart. This makes the journey more interesting, and if any passengers are feeling seasick, it's encouraging for them to see how quickly we're reaching our destination."

Stena Lynx II routinely reaches 36 knots, carrying up to 600 passengers. Navmaster is reportedly the only Windows-based electronic chart system licensed for ARCS.

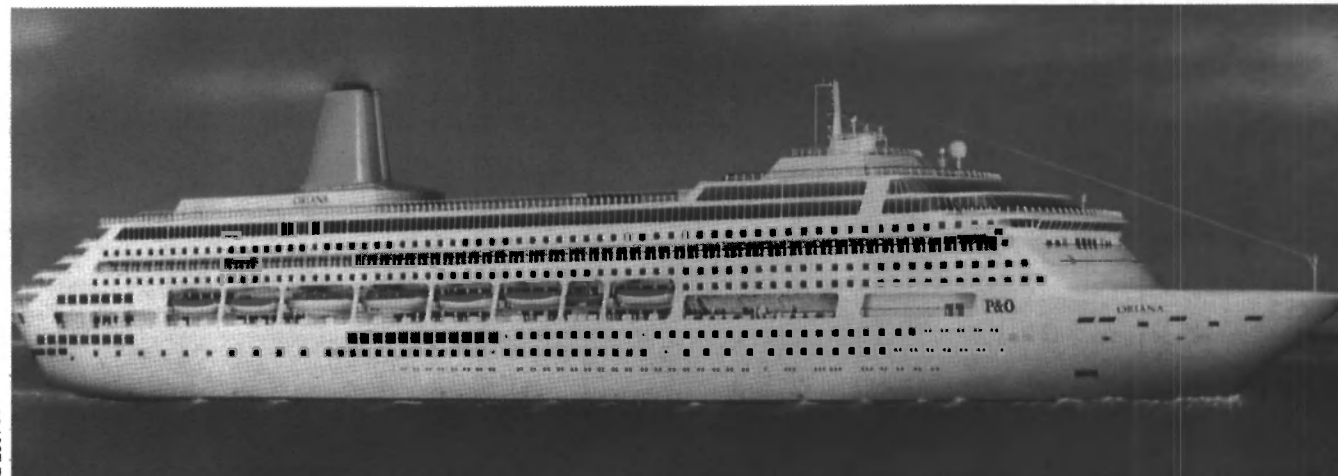
A key development criterion was for the software to be compatible with future electronic chart developments. Navmaster is independent of chart type; new chart formats can reportedly be accommodated without altering the core functions, giving users an assured upgrade route should they wish to upgrade to ENC charts and ECDIS in the future.

For more information on PC Maritime
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July, 1996

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Pegasus One Christened At Fincantieri



The state-of-the-art fast ferry MDV12000 *Pegasus One*, built by Fincantieri's Riva Trigoso Shipyard for Ocean Bridge Investments, was recently christened. The vessel is the outcome of research studies made by Fincantieri regarding hulls capable of developing high speeds in rough seas. The new 312-ft. (95-m) fast ferry is powered by four MTU 20V 1163 TB73L diesel engines with a total power rating of 24,000 kW.

The *Pegasus One* is designed to carry 600 passengers and more than 170 cars. Car embarking/disembarking is carried out through a large stern door on the main car

deck, and through three moving ramps which connect the two garage decks.

High Tech...Inside and Out

The *Pegasus One* features high technological outfitting solutions on the inside of the vessel as well. The advanced technology of Metalleido — manufacturer of all of *Pegasus One's* indoor panels — made it possible for interior decorator Arredamenti Porto to furnish a highly advanced interior outfit. These new composite panels were developed and patented by

Metalleido in Genova during five years of research within the Brite Euram program, which was financed by the European Economic Community.

The composite panels, called Mitlight, reportedly feature excellent mechanical properties. Mitlight is made according to a patented process based upon glass-fiber reinforced, three-dimensional fabric which has also been patented.

The new material successfully passed the ISO 9705 "Full Scale Room Corner Test" required by the

MSC 40 (64) Resolution.
For more information from Fincantieri
Circle 105 on Reader Service

Pegasus One Main Particulars

Main engines	..... MTU
Waterjets	..... KaMaWa
Length o.a.	..... 312 ft. (95 m)
Beam	..... 52 ft. (16 m)
Draft	..... 9 ft. (2.7 m)
Max. dwt	..... 400
Hull construction High tensile steel
Passengers 600
Cars 170
Service speed 36 knots
Max. speed 40 knots

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Events A dinner banquet will be held at the 85,000 sq-ft Ft. Lauderdale Museum of Discovery and Science. The museum features the five-story high IMAX theater screen and over 200 hands-on exhibits. Also planned are several tours of Navy and commercial ships including the US Customs Service's *Blue Thunder* high speed drug intervention boat.

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July, 1996

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50 Hz 1500	16 kW	24 kW	33 kW
Model	M55C	M65C-4	M65C-6
60 Hz 1800	55 kW	65 kW	65 kW
50 Hz 1500	45 kW	50 kW	50 kW
Model	M80C	M99C	
60 Hz 1800	80 kW	99 kW	
50 Hz 1500	N/A	80 kW	

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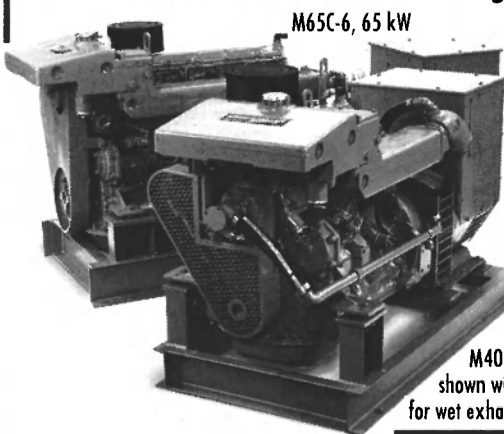
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M40C, 40 kW
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39



Meeting New Berth Demands: Cruise Leaders Reignite Search For First-Time Business

ABOVE: Royal Caribbean's *Grandeur of the Seas* newbuild is shown in Kvaerner Masa-Yards' docks. The 73,000-ton, \$300-million ship is scheduled for November delivery.

By Bridget A. Murphy,
associate editor

Ship orders are in, joint ventures are underway, consolidations are spreading and a new player has emerged; yet the key to long-term profitability in cruise shipping lies in the success of one strategy — the industry's ability to attract first-time passengers. In the struggle to stay afloat, some cruise lines have stressed product differentiation in an attempt to capture specific passenger segments. Others have touted aggressive new-build schedules and European expansion programs as the panacea for continued growth. However, it has become increasingly clear that the industry must continue to convert "potentials" into "clients" if it is to support the volume of new berths produced before the turn of the century.

A recent debate within the Cruise Lines International Association (CLIA) concerning setting aside funds for generic advertising targeted at promoting cruising in the U.S. has recalled this idea in the minds of cruise executives. As stated by Carnival Cruise Lines' Vice President of Sales Maurice Zarmati: "Every time you advertise a bow, it doesn't really matter whose logo is on it ... We need more bow advertising." And many tend to agree with him, including Royal Caribbean Cruises Ltd. Chairman and CEO Richard Fain, Disney Cruise Line President Art Rodney and Carnival Marketing and Sales Senior Vice President Vicki Freed. These executives discussed the cruise marketplace and company strategies for growing business, as well as confided their views on the CLIA debate during recent sessions with *MR/EN*.

A Crown Tradition

Nautically speaking, a "crown" is the thick, arching end of a ship's anchor shaft that provides stability and strength; a fitting logo for Royal Caribbean Cruises Ltd. (RCCL) — a line which has emerged as a dominant player in the sector, consistently posting generous profits over nearly three decades of operation. Richard Fain's description of the market conditions that contribute to the success of his outfit is classically understated: "Where there have been more ships, there have been more passengers," he said, adding, "I think it's looking good. I feel a lot more bullish today than I did a year or two ago."

Mr. Fain admitted that passenger rates have fallen short of his expectations, although he countered claims of diminishing passenger counts by reasoning that 19 percent more pas-



Richard Fain makes no secret of his company's plans to infiltrate the European market.

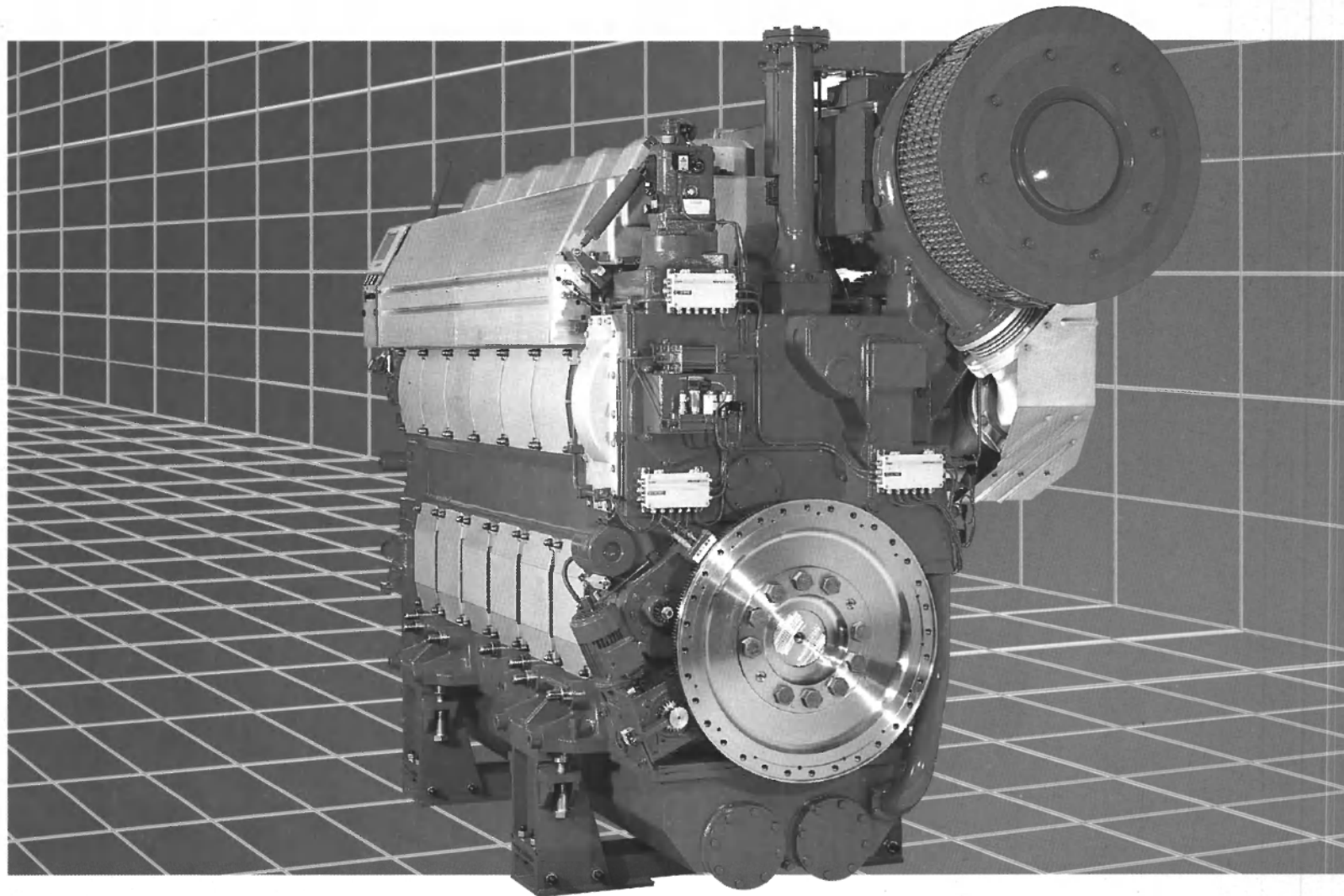
photo: Bridget A. Murphy

sengers have been carried on ships, despite the 13 percent overall drop in capacity. The Royal Caribbean chairman agreed that the practice of "deeply discounting" fares, instituted in order to woo passengers, has contributed to an overall cheapening of his company's cruise product. "In 25 years, we have not been satisfied with the compensation we've received given the quality of the product we're offering," said Mr. Fain. In order to reverse this situation, without discouraging first-timers, he explained RCCL's updated strategy: "Discounting is now not across the board ... We will offer a series of specific, specialty discounts. We've become much more sophisticated in the targeting of discounts."

Although he expressed support for "overcoming myths of cruising," the Royal Caribbean executive discussed CLIA's proposal to fund generic ads with an air of caution, saying: "Nobody wants to spend money on what they feel is not an effective campaign, and everyone has an idea of what is an effective campaign." However, Mr. Fain did stress the importance of increasing the visibility of cruising as a strategy for attracting passengers, and in this context, he spoke about the emergence of Disney Cruise Line.

"Disney's entry will add visibility and credibility to the industry and I think that's very good," stated Mr. Fain. He said that the company will bring recognition to cruise shipping as a major substantive industry in the U.S., and as a "significant economic engine for this country." He went on to compare RCCL's product with his perception of the product Disney

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will offer. "What cruising does is says 'we'll have a family vacation that everybody likes.' We're offering what I would call a family vacation, where Disney will be offering 'guilt trips,'" said Mr. Fain. He defined guilt trips as the penance parents pay for favoring the workplace over time at home with their children, and added: "There is a need for these guilt trips ... They will be wonderful for the industry." Projections aside, Mr. Fain concluded: "Disney will not be a significant competitor in terms of capacity in the cruise industry. It is targeted at a very specific niche."

A Royal Expansion Strategy

Moving beyond a discussion of the general marketplace, the RCCL executive zeroed in on his company's highly publicized strategy for growing business — the recruitment of international passengers. "We've made no secret of our goal of building our European base. Most of building market shares comes from building new ships for these markets," said Mr. Fain.

One of RCCL's most recent attempts to increase its European marketshare fell flat when negotiations with Italian cruise interest Costa Crociere were broken off for undisclosed reasons. Briefly commenting on this matter,

Mr. Fain said: "Costa has a very good market position. The idea of doing something with them was quite attractive to both of us. We both worked hard at studying it and came to the mutual conclusion that each of us would be better on our own." He further stated: "We will continue to look at opportunities to strengthen our European base. It doesn't look like investing in another cruise line is likely to be the way we'd go at this point."

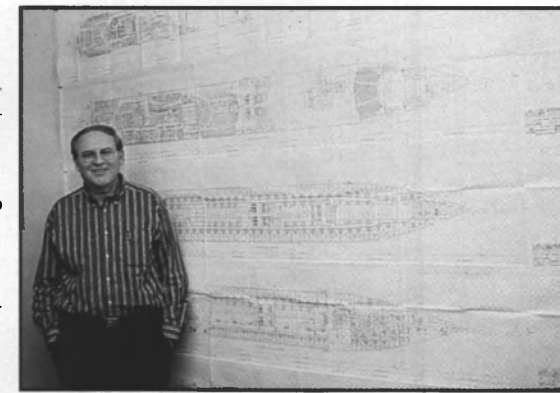
While he declined the opportunity to discuss the recent Carnival-Airtours deal, which provides a competitor with an indisputable presence in Europe, Mr. Fain did entertain questions on the possibility of increasing his company's foothold in the Far East. "Potential is there. I have to say it is a long-term potential. Positioning *Sun Viking* in the Far East allows us to build up expertise slowly and methodically. I think you will see us exploit that expertise in years to come," said Royal Caribbean's chairman.

Mickey Casts Off To Sea

In June 1994, the Disney enterprise plunged into rarely chartered waters by founding its own cruise line, and shortly thereafter named cruise veteran Art Rodney to the presidency of

its new affiliate, Disney Cruise Line (DCL).

According to Mr. Rodney, Disney took the initial steps to invest in vessel ownership based on its desire to be part of the industry's growth. "It was a natural evolution. Disney is in the entertainment industry. A cruise ship was a natural extension of our core business," said the Disney cruise executive. Whether Disney's past affiliation with Premier Cruise Line influenced the corporation to test the waters is unknown, but Mr. Rodney was willing to discuss the break in ties with Premier: "I think we felt we could do a better job operating a cruise line, and that we wanted to control our name and prod-



Art Rodney exhibits the building plans for Disney's cruise vessels at DCL's corporate offices in Orlando.

New Ships: 1996 And Beyond

Cruise Line	Ship	Delivery Date	Berths	Tonnage	Cost (\$M)
1996					
Carnival Cruise Lines	Inspiration	4/96	2,021	70,367	\$270
Carnival Cruise Lines	Carnival Destiny	11/96	2,600	100,000	\$400
Celebrity Cruises	Galaxy	11/96	1,870	73,000	\$320
Costa Cruises	Costa Victoria	7/96	1,928	75,000	\$300
Dolphin Cruise Line	IslandBreeze	5/96	1,102	38,175	N/A
Holland America Line	Veendam	4/96	1,266	55,000	\$231
Norwegian Cruise Line	Norwegian Crown	3/96	1,040	34,250	N/A
Royal Caribbean Cruises Ltd.	Splendour of the Seas	3/96	1,804	70,000	\$325
Royal Caribbean Cruises Ltd.	Grandeur of the Seas	11/96	1,950	73,000	\$300
Seabourn Cruise Line	Seabourn Legend	7/96	204	10,000	N/A
World Explorer Cruises	Universe Explorer	7/96	708	23,500	N/A
1997					
Celebrity Cruises	Mercury	11/97	1,870	74,000	\$320
Costa Cruises	Costa Olympia	1997	2,050	78,000	\$350
Holland America Line	Rotterdam VI	10/97	1,318	62,000	\$250
Princess Cruises	Dawn Princess	1997	1,950	77,000	\$275
Radisson Seven Seas Cruises	Paul Gauguin	12/97	320	16,000	N/A
Royal Caribbean Cruises Ltd.	Enchantment of the Seas	9/97	1,950	73,000	\$300
Royal Caribbean Cruises Ltd.	Rhapsody of the Seas	4/97	2,000	75,000	\$275
1998					
Carnival Cruise Lines	Elation	1998	2,021	70,000	\$300
Carnival Cruise Lines	Paradise	1998	2,021	70,000	\$300
Carnival Cruise Lines	Carnival Triumph	1999	2,600	100,000	\$400
*Disney Cruise Line	Disney Magic	1/98	1,740	85,000	N/A
*Disney Cruise Line	Disney Wonder	12/98	1,740	85,000	N/A
Princess Cruises	Grand Princess	1998	2,600	104,000	\$385
Royal Caribbean Cruises Ltd.	Vision of the Seas	4/98	2,000	75,000	\$278
Silversea Cruises	Unnamed	1998	396	22,000	\$200+
1999					
Silversea Cruises	Unnamed	1999	396	22,000	\$200+
Princess Cruises	Sea Princess	1999	1,950	77,000	N/A

Source: Cruise Lines International Association.
*CLIA membership begins in January 1997.

uct," the DCL president told *MR/EN*.

He also confirmed rumors that DCL will focus its attention on booking first-time passengers. "We want to try to break down the barriers. First-timers will have much more confidence trying a cruise with Disney than anybody else ... We expect to get a lot of people who haven't cruised yet," said Mr. Rodney.

But how will the 85,000-ton *Disney Magic* and *Disney Wonder* fair in a market that will be flooded by new tonnage by 1998? The Disney executive qualified his answer by putting it into context with market conditions. "I think what we're seeing is a lot of opportunity in the industry because the industry is building a lot of new ships right now. The older ships are the ones that are feeling it," said Mr. Rodney.

"SOLAS (Safety of Life At Sea Convention) will help to tighten up the demand for the newer ships," continued Mr. Rodney, adding, "Our brand is differentiated from the rest of the industry ... Based on our research, the customer considers us in a whole different quadrant. We're in a different league. Our ships will be Disney ships and that's what we're selling." But this inherent product differentiation will apparently not dissuade the cruise line from supporting CLIA ads aimed at promoting cruise shipping at large. Although Disney's CLIA membership won't kick in until January 1997, "Our position right now is that we will participate in the advertising," said Mr. Rodney.

New Arrival Makes Waves

Since announcing plans to enter cruise shipping, Disney has spared no expense in its efforts to penetrate the sector. With architectural plans completed for the private Disney cruise terminal — Terminal No. 8 — to be raised at Port Canaveral, construction will be bidded out this summer. DCL also acquired Gorda Cay — a 1,000-acre, private Bahamian island that will be used as a vessel day-stop location. And these two ventures are in addition to enlisting the expertise of Fincantieri — one the world's most renowned cruise new-building yards — and Lloyd's Register, a premier classification society.

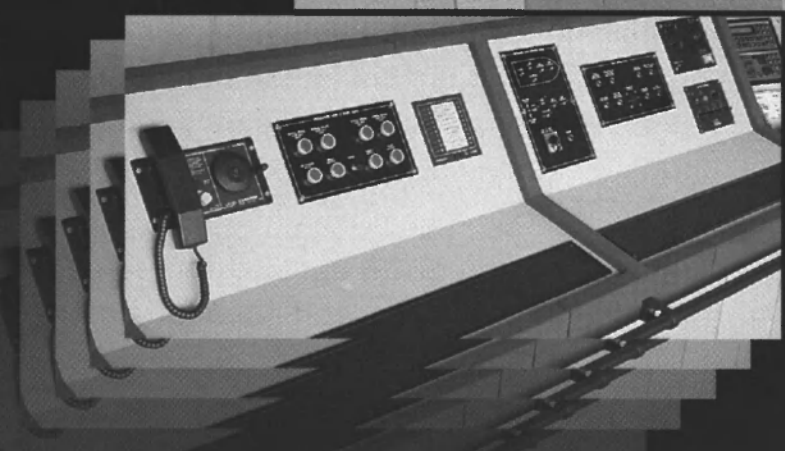
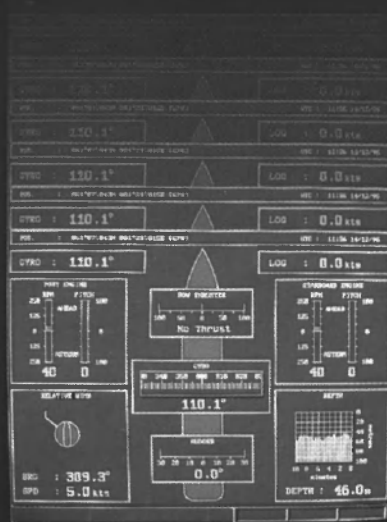
According to Mr. Rodney, the decision to go with Fincantieri came down to three key factors: price; delivery time and design interpretation. He said that the yard "did a very good job of interpreting what our designers wanted,"

Maritime Reporter/Engineering News

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and was able to meet Disney's abbreviated time schedule. "They were the most competitive when it came down to it," he concluded.

On the safety front, despite the obvious advantage of not having to retrofit ships for compliance with MARPOL (marine pollution) and SOLAS requirements, DCL and Lloyd's have already begun structuring safety management plans for shoreside facilities in preparation for the 1998 requirements of the International Safety Management (ISM) Code. "We have a task force put together and we're hoping to get certified before we start operating," said Mr. Rodney.

With funds sunken into a private terminal, private island, in-house design team and premier builder and classification society just for starters, Disney Cruise Line has displayed the makings of a sector powerhouse. On several occasions, Mr. Rodney has spoken of Disney's desire to build an entire fleet of ships, although for the record he noted: "Nothing has been committed beyond the two ships. If we're successful, as we think we'll be, certainly we'll build additional ships." And although DCL has no plans at this time to build ships specifically for the Euro market, "We will get a lot of Europeans coming to Port Canaveral to take our seven-day packages," the DCL president said.

With seemingly inexhaustible resources and marketing muscle, the arrival of Disney on the cruise scene will undoubtedly enhance the image and profitability of the sector. The question that remains to be answered, as hinted at by Mr. Rodney, is whose pockets those profits will end up in.

Business Booms Aboard Fun Ships

With a goal of converting landlubbers to seagoing vacationers, Carnival Cruise Lines (CCL) has launched its "Vacation Getaway" campaign, which specifically taps into people's misgivings about a taking a cruise by guaranteeing refunds and paid



Vicki Freed on CLIA's generic ads: "I'm an optimist, but I think people are going to look at their own individual brands ... The fall doesn't look healthy for many of them."

fares home to dissatisfied passengers who disembark at the first port of call. According to Vicki Freed, the idea behind this campaign is to "Motivate people who are sitting on the fence to try a cruise."

"As an industry, we need to grow the first-timer cruisers," continued Ms. Freed, adding, "Only seven percent of the population has tried a cruise." And despite this low percentage, business seems to be booming aboard Carnival's fun ships. Maurice Zarmati pointed to the construction of a twin office building on Carnival's Miami premises as evidence of the company's expansion. "I'm happy to report that business at Carnival is excellent. 1995 was a banner year ... We've been running at over 100 percent occupancy for the last 20 years."

Mr. Zarmati laid out Carnival's strategies for absorbing its 51 percent planned growth: "The number one area of opportunity for Carnival is to continue to look for first-time cruisers. Our second biggest opportunity is to turn a good portion of the agency community into sellers rather than distributors." He recalled that for every one person who takes a cruise, nine people take land-based vacations. "Our brokers need to behave the same way other businesses that compete for that discretionary dollar behave ... The customer is either spending it here or somewhere else, but he or she is going to spend it," said the Carnival exec.

Both CCL executives expressed support for CLIA's efforts to promote cruise shipping to the general public. "People right now are looking at the trees, not the whole forest. You can't look at your individual tree for a long period of time," said Ms. Freed. She also encouraged cruise interests to learn from the success of the agricultural industry's generic ads: "Somehow the industry was able to discuss the product and not the brand — knowing that everybody would get their fair share." Mr. Zarmati offered further rationalization for Carnival's stance: "We don't consider another cruise line a competitor. The reason is, once you sail a ship, you've done your job."

Having recently acquired a valuable business lever in Europe via the Airtours deal, the Carnival executives discussed the company's plans for taking the fun ship concept to Europe. "Now that we have some ownership in what we believe is one of the finest U.K. (travel) agencies ... our ships are just waiting to welcome our guests," said Mr. Zarmati. He said that in the U.K., Carnival "has had a number of sales training and product training seminars informing their front line salespeople," and added, "As they (Airtours) put their resources at our avail-



photo: Bridget A. Murphy

According to Maurice Zarmati, "First-time cruisers have no idea about cruises. The repeater is the one who looks for the discounts."

ability in Scandinavia, we will bring in our team." The Carnival exec also leaked news of company plans to send 2,400 U.K. agents from the Airtours-owned Going Places travel chain to Italy to spend a night aboard *Carnival Destiny* after it leaves Fincantieri's Monfalcone yard, before the ship's inaugural journey to the U.S. East Coast. "We're hoping to bring most of the Going Places distribution system to Venice to experience our new ship," said the Carnival rep, although he said plans have yet to be finalized.

Ms. Freed offered further comment on CCL's Euro strategy: "At some point, as the cruise market here becomes more and more sophisticated, a good place to deploy the older vessels — vessels built in the 1980s — would be Europe."

U.S. Yard Contracts: Potential P.R.

Vehicles?

With the cruise sector's search for new passengers coinciding with the U.S. government and maritime industry's push to drum up domestic commercial shipbuilding business, perhaps it not far fetched to suggest a mutually-supportive relationship. Giving U.S. yards a slice of cruise newbuild action might be a brilliant plot for capturing the attention of a significant American workforce.

And although, realistically, newbuild contracts are probably more than a few years down the pike for U.S. yards, San Diego-based yard National Steel and Shipbuilding Co. (NASSCO) has paved the way by formulating its own cruise ship design with funds from the government-sponsored Maritech program.

As stated by Richard Fain, "There is no reason why the U.S. should not be able to reinvigorate its shipbuilding capabilities if it wanted to do so." He added: "American shipyard labor is equal to or less expensive than the labor at



Meyer Werft Lays Keel For 73,000-Ton Mercury

According to reports issued from Papenburg, Germany, on May 29, the first block of the cruise vessel *Mercury* under construction at Meyer Werft was lifted into place by a 600-ton gantry crane, and lowered down onto keel blocks in the yard's covered building dock.

Mercury is the last in a series of three cruise vessels contracted to the yard by Miami-based Celebrity Cruises. The first of the series — *Century* — entered service in 1995, and *Galaxy* will follow this year. The first block of the new vessel is 63.9 ft. (19.5 m) long, 105.6 ft. (32.2 m) wide and weighs 550 tons. With an overall length of 865.8 ft. (263.9 m) and a breadth of 105.6 ft. (32.2 m), the 73,000-gt *Mercury* will be capable of carrying 1,866 passengers. An engine output of 37,130 kw will reportedly provide the ship with a speed of 21.5 knots. Following its delivery in late 1997, *Mercury* will operate cruises to the Eastern and Western Caribbean.

The first block of Celebrity Cruises' *Mercury* was recently lowered down onto keel blocks. In the background, sister vessel *Galaxy* nears completion.

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the yards where we build ships." The RCCL chairman also said that the quality of work of U.S. yards is equal to or better than the skills of European counterparts, and with foreign subsidies falling, American yards might at last see an opportunity in the cruise sector. However, he noted: "Cruise ships require specialization that isn't usable for other products. That may make it less desirable in the near term as a focus."

Art Rodney also spoke about Disney's efforts to keep a chunk of its business in the U.S.: "We did try to diversify and get as much business for the U.S. suppliers as possible. GE did get a major contract." He also expressed support for U.S. commercial shipbuilding and spoke about Newport News' sparsely publicized role in the Disney ship bid process. "Newport News participated in the bidding process when we considered building our ships." According to Mr. **Rodney**, the yard did not offer Disney a price quote. "They were not in a position to meet our timetable, so they withdrew basically," said the cruise executive.

It seems reasonable to suggest that as cruise lines look to implement capacity-boosting strategies with the debut of new tonnage, U.S. berth-builders and equipment suppliers should not be overlooked as a possible jumping off point for increasing cruise shipping awareness within the general public.

Cruise Notes

Show organizers have announced that the 1997 **Cruise Shipping** event has been scheduled to take place March 11-15 at the Miami Beach Convention Center. Contact Miller Freeman (Princeton) Inc. at tel: (609) 452-9414, or fax: (609) 452-9374 for more information.

The **Cruise Lines International Association (CLIA)** has announced that it will welcome its newest member, Disney Cruise Line, next January. CLIA has also launched a web site, found at <http://www.ten-io.com/clia>.

According to reports issued from **Sperry Marine**, the company will supply the integrated bridge systems for *Disney Magic*. "We provided Disney with detailed system designs and they liked what they saw," said Sperry Senior Manager Frank Socoli. "Disney was also quite impressed with Sperry Marine because we manufacture the vast majority of our own system components. They felt we would be better able to provide a well-integrated system and be in a better position to support it with reliable service," added the Sperry rep.

Princess Cruises has reportedly unveiled the industry's first direct ship telephone service. Starting in April,

passengers aboard *Sun Princess*, *Crown Princess* and *Star Princess* were instantly connected with the broadcast center or purser's office aboard the ships after dialing 1-900-CALL SHIP, without contact with Inmarsat or knowledge of the vessel identification number or ocean region code.

Ashland Chemical's Drew Marine Division now manufactures automated monitoring systems that reportedly allow cruise ships to efficiently maintain vital operating systems in spite of continuing crew reductions. The company's AWT and ACWT automated water treatment systems provide com-

puterized, continuous monitoring and control of water chemical conditions in steam generating and diesel cooling water systems, helping to extend equipment life through real-time remediation of harmful water conditions that can contribute to corrosion.

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chairman and chief executive officer of **Renaissance Cruises, Inc.**, announced that the company's affiliate -- R Shipping, Inc. -- signed a binding letter of intent with the GEC Alsthom subsidiary **Chantiers de l'Atlantique** for the construction of three, 600-passen-

ger cruise ships. Projected cost for the three vessels is in excess of \$500 million.

In May, **Celebrity Cruises** entered the Alaskan market, with the positioning of its 46,811-ton luxury vessel *Horizon* in the state, for a series of seven-night

Inside Passage and Glacier Route voyages. According to **Celebrity** President Richard E. Sacco, "The repositioning of the fleet has enabled **Celebrity** to enter this market with a stimulating Alaska cruise experience combined with **Celebrity's** distinctive,

premium level of award-winning onboard service and cuisine." The vessel had just completed a season in San Juan.

On March 18, in a special ceremony at **Chantiers de l'Atlantique** shipyard in St. Nazaire, France, **Royal Caribbean Cruises Ltd.** Chairman and CEO Richard Fain accepted delivery of the company's newest ship -- 1,800-passenger, 69,130-ton *Splendour of the Seas*. *Splendour* is the first of five ships the company will introduce during the next two years, with additional passenger capacity totaling 7,900 passengers. For more information, visit the cruise line's web site at <http://www.royalcaribbean.com>.

British company **Gradus Lighting Ltd.** has introduced a new, low lighting system designed to provide clear and bright illumination for safe evacuation of passengers from smoke-filled cruise vessel areas. The system, *Pathfinder*, has been specifically formulated for compliance with IMO's 1997 requirements.

Early in 1996, **Holland American Line (HAL)** announced that its flagship *Rotterdam* would be officially retired from service in September 1997. On March 13, HAL said that its newest cruise vessel, scheduled to enter service on August 1, in time for the company's one hundred twenty-fifth anniversary, had been named *Rotterdam VI*. The 62,000-ton, 1,320-passenger ship is under construction at **Fincantieri's** Marghera facility. The cruise line also reaffirmed its historic ties to Holland by reflagging seven of its eight large luxury cruise ships in the Netherlands on May 13.

In April, U.K.-based **Information Management Consultants (IMC)** became the new owners of Ocean Satellite Television, bringing together the passenger services of both companies. "This move will allow us to give our cruise customers a much wider choice of news products," said Bernie Thomas, one of IMC's joint managing directors. IMC can now offer newly developed services to cruise passengers, such as personal stock portfolio daily reports and credit card validation while at sea.

SeaVision, Inc. introduced its new interactive television system at Cruise Shipping '96. This system is a further development of the system installed on **Norwegian Cruise Line's** *Dreamward* in September 1995, which provides passengers with a wide variety of services, including shore excursion preview and purchasing, room service, wine ordering, gaming and in-cabin movies.

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of commercial shipboard satellite systems, has introduced its TV-at-Sea systems, which transmit satellite television programs to ships in all the major ocean areas. A fully stabilized antenna is part of the Model 2494 system, which locks the satellite onto the ship as it pitches and rolls. An RCA DDS receiver is provided as part of the system, and decodes the digital programming from DIRECTV and USSB.

IGC Satellite Services provides cruise ship passengers with the technology to make phone calls, send faxes and e-mail, access the Internet and make use of video conferencing while at sea. According to a company rep, "Our maritime experts are taking the cruise industry into the twenty-first century by allowing passengers on a cruise to communicate how and when they want." One-minute calls cost a reported \$9.50.

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Ateliers & Chantiers du Havre To Supply Cruise Ship Fin Stabilizer

Ateliers & Chantiers du Havre (ACH) will supply its Alpha-Fin stabilizer to Chantiers de l'Atlantique for installation on cruise ship **Paul Gauguin** building at the French yard for Radisson Seven Seas Cruises. The fin system, the result of 30 years of experience in roll stabilization for merchant and military vessels, consists of a main body with two associated trailing edge fixed flaps. According to ACH, the cavitation tunnel and towing tank tests have

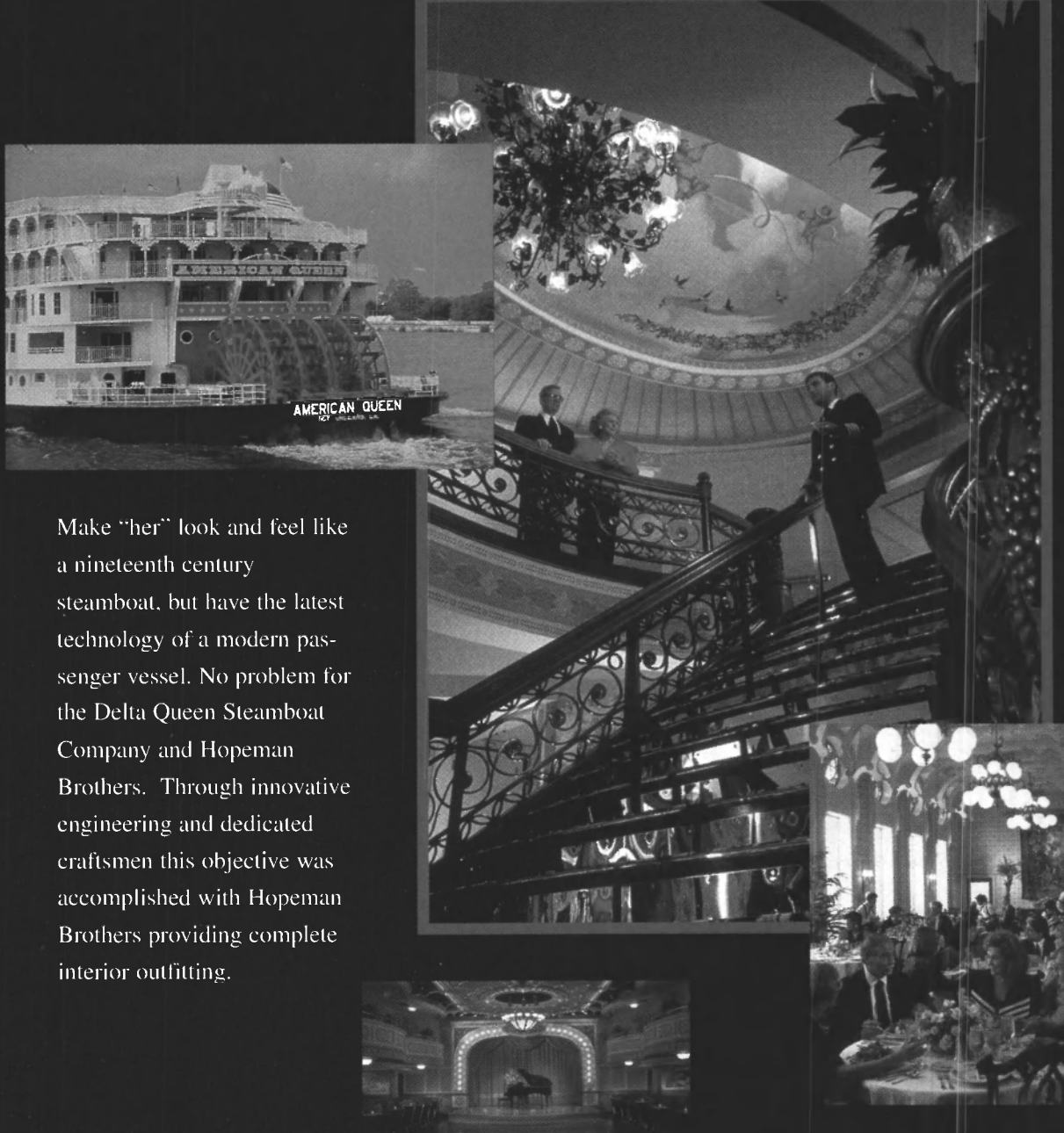
illustrated several hydrodynamic advantages associated with use of the fin stabilizer, namely: 35 percent improvement in lift coefficient; 35 percent reduction in drag coefficient; a larger stall angle; and a reduction in cavitation in the common operating range.

These factors will combine to reduce drag motion, resulting in increased fuel savings. Risks associated with jamming flap joints are also avoided; as the new fin has been stripped of fin/flap joints — making it simpler to manufacture and easier to maintain.

GE Secures Disney Orders

GE Marine won the contract to supply electric propulsion and control systems for the two new Disney ships. GE will supply two 25,000-hp propulsion motors, associated LCI drives, PLC-based controls and more.

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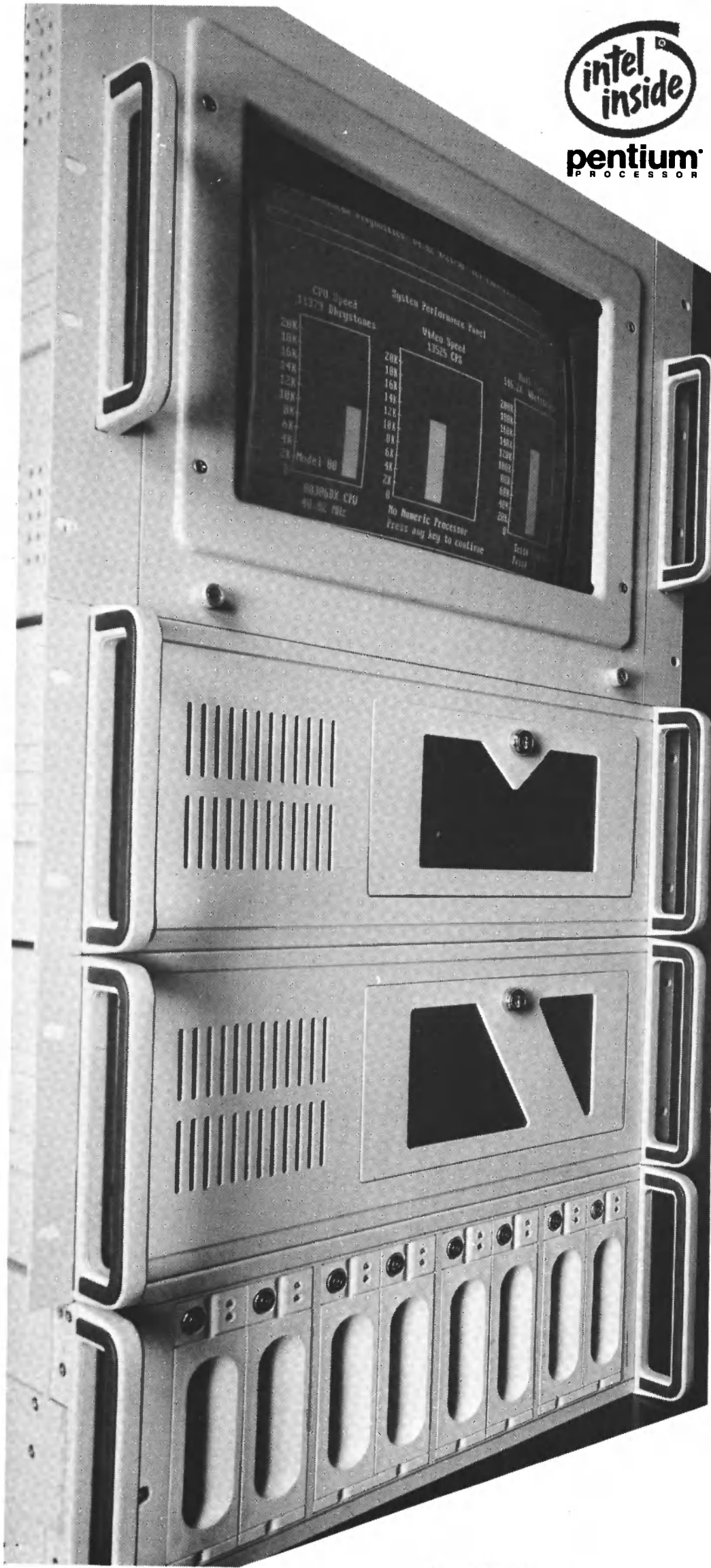
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Diesel Engine Guide

The following section is a collection of news and information from some of the world's leading marine diesel engine manufacturers. It is intended to inform readers of recent and near-term developments, in a

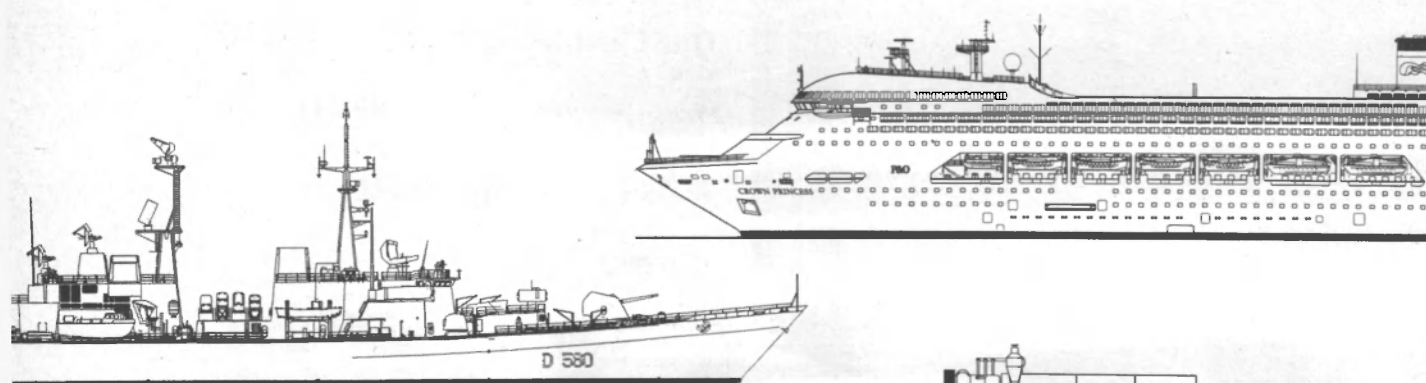
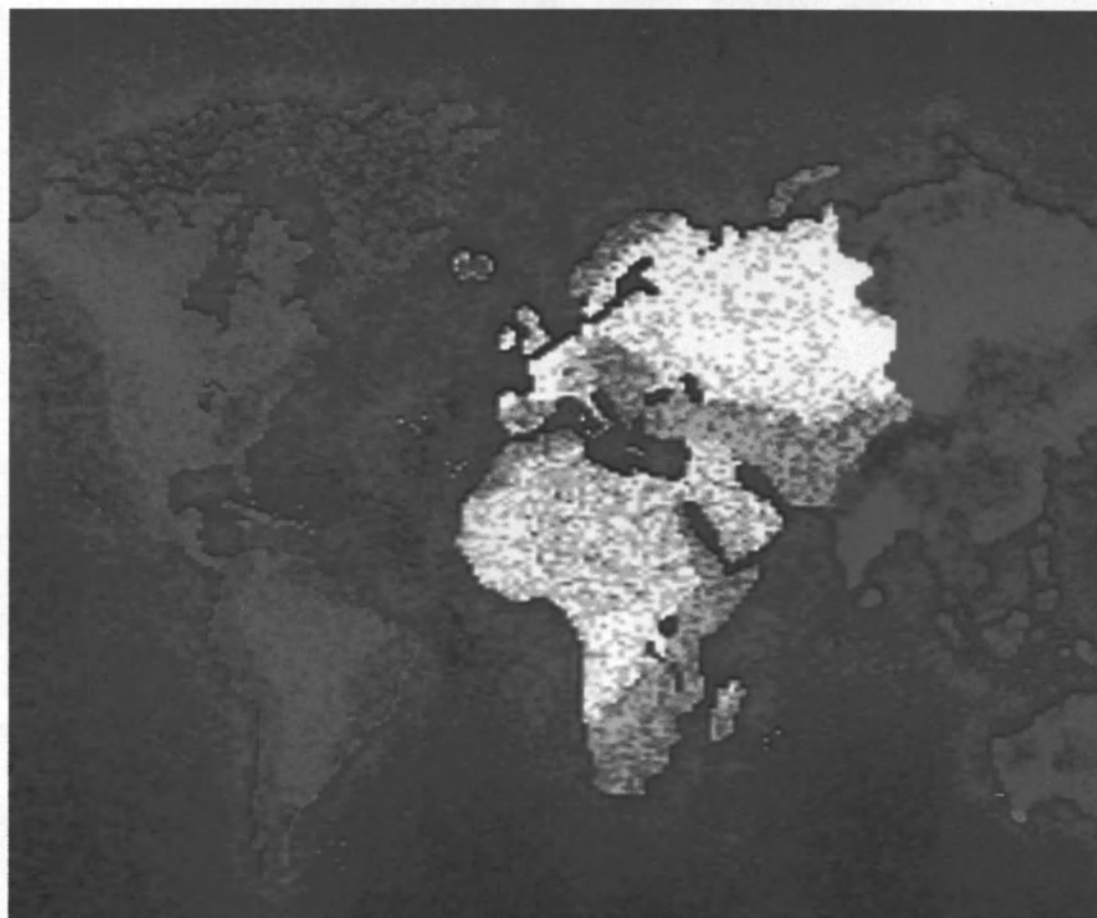
quick-read format. To receive additional, technical details from any of the manufacturers mentioned in this section, please circle the appropriate number on the Reader Service Card bound in this edition.

FINCANTIERI IS BUILDING FOR THE SEA

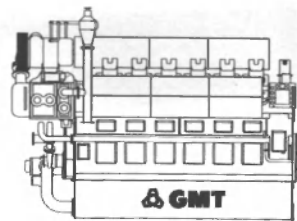
Fincantieri is the largest and most diversified shipbuilding yard in the Mediterranean, and one of the largest in Europe. The operational capability and structures of the oldest and most glorious Italian companies of the sector have met in Fincantieri, during its more than two century long history. An accumulated, improved, and continuously updated wealth of experience acquired through the construction of over 7,000 vessels of all types allows today Fincantieri to offer technologically advanced answers to all marine operators' requirements, thanks to its organization structure made up of three Divisions: Merchant Shipbuilding and Conversions, Naval Constructions, and Diesel Engines.

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Circle 229 on Reader Service Card



Alaska Diesel

Circle 75 on Reader Service Card
Alaska Diesel Electric makes Northern Lights generator sets (5-708 kW), Lugger propulsion diesels (67-1300 HP) and the STARS anti-soot system. Northern Lights and Lugger have reportedly earned a reputation for reliability and smooth operation. New Luggers include the 700-hp L6140AL2 and the 410-hp L6108A2.

Caterpillar

Circle 119 on Reader Service Card
Caterpillar Engine Division has announced new, higher ratings for CAT 3612 and 3616 marine propulsion engines for fast craft. The 3612 gains 190 kW (269 bhp) for a fast commercial vessel rating of 4,250 kW (5,700 bhp) at 1,000 rpm. The 3616 gains 203 kW (305 bhp) with the new rating, for a total output of 5,650 kW (7,575 bhp) at 1,000 rpm. Special ratings, with specific load profiles matched to military applications, bring ratings for these two largest Caterpillar engines even higher: to 4,625 kW (6,200 bhp) at 1,000 rpm for the 3612, and 6,150 kW (8,245 bhp) at 1,000 rpm for the 3616.

Daytona Marine Engine Corp.

Circle 85 on Reader Service Card
Daytona Marine's engine line ranges from 80 to 925 hp covering continuous duty, commercial duty and pleasure craft ratings. A new range of light weight marine diesels will be introduced later this year, covering 50 to 200+ hp. An engine in the 100-hp range, weighing 300 lbs and measuring 25-in. or less in all dimensions will be typical of these new engines.

Deere Power Systems

Circle 86 on Reader Service Card
Building on the success of its John Deere PowerTech .9 to 8.1 L engines produced last year, Deere Power Systems Group has introduced Hog Deere PowerTech 10.5 to 12.5 L engines, offering up to 375 and 500 hp, respectively, for a variety of applications. In addition to meeting current and anticipated off-road emissions regulations, PowerTech 10.5 and 12.5 L engines reportedly maintain the standard of reliability and durability established by John Deere engines. Features include the camshaft located high in the head, reportedly resulting in the elimination of pushrods and lifters; more precise control valve events; fewer parts; fewer wear points and an extended valve adjustment period.

Detroit Diesel

Circle 89 on Reader Service Card
Detroit Diesel Corporation is engaged in the design, manufacture, remanufacture, sale and service of heavy-duty diesel and alternative fuel engines, automotive diesel engines and related products. The company offers a complete line of diesel engines from five to 10,000 hp for the marine, power generation and military markets. Detroit Diesel serves these markets directly and through a worldwide network of more than 2,500 authorized distributors and dealers.

Dieselmotorenwerk Vulkan GmbH

Circle 80 on Reader Service Card
Dieselmotorenwerk Vulkan GmbH (DMV) is a manufacturer of diesel engines up to 68,520 kW under licenses of MAN B&W, New Sulzer Diesel, and MHI. DMV also produces spare parts for

Diesel Engine Guide

two-stroke engines, propellers, castings of cast iron components for diesel engines, and repairs of two and four stroke engines.

Electro-Motive Division

Circle 96 on Reader Service Card

The Electro-Motive Division (EMD) of General Motors Corp. produces diesel power for marine propulsion, offshore and land-based oil well drilling rigs, power generation and other industries. A complete line of GM/EMD engines is reportedly available to meet requirements for marine propulsion and marine generator set applications. A complete power package with engine, reverse-reduction gear or generator and accessories is available through the EMD Power Products Distribution Network worldwide. Propulsion units are also reportedly available without skid mounting for direct application to the vessel structure.

For marine propulsion, EMD offers eight, 12, and 16-cylinder Roots-Blown 645E6 series engines and eight, 12, 16 and 20-cylinder turbocharged 645F7B and 710G7B diesels. The Roots-Blown models offer a power range from 1,050 to 2,100 hp at 900 rpm. The turbocharged engine rating range begins at 1,700 hp for the eight-cylinder 645F7B. For genset applications, EMD engines cover a continuous output range from 745 to 3,580 kW at 60 Hz-900 rpm and 570 to 2,980 kW at 50 Hz-750 rpm. Electro-Motive continues its ongoing research efforts to improve engine performance, particularly in the areas of fuel efficiency and emissions with an emphasis on electronic fuel injection.

Fairbanks Morse Engine

Division/Coltec Industries

Circle 88 on Reader Service Card

Fairbanks Morse offers a complete line of modern diesel engines produced for both marine and stationary applications. A variety of medium-speed engines from 640 to 29,322 bhp is also available.

GEC Alsthom

Ruston Diesel

Circle 79 on Reader Service Card

GEC Alsthom Ruston Diesel's medium-speed engines provide main propulsion and auxiliary power — 780 to 7,080 kWb — for a wide range of commercial and naval vessels. The company first supplied engines for towing power in 1935, and maintains a profile in today's market. In 1990, Ruston powered the first 242.7 ft (74 m) wave piercing catamaran in its record breaking crossing of the Atlantic. To date, the company has powered 22 fast ferries. In 1995, the company introduced a 20-cylinder version of its engine, meeting the demand for higher power. Since its release, the engine has been specified for nine vessels.

KHD Canada

Circle 77 on Reader Service Card

KHD Canada is a wholly-owned subsidiary of Deutz MWM of Germany. Deutz MWM has launched the 616 engine series, an efficient, high performance diesel reportedly capable of providing up to 1,360 kW at 2,300 rpm at only 2,600 kg. The 620 series is being lightened with an improved block and more efficient cooling system.

Krupp MaK

Circle 120 on Reader Service Card

The Krupp Group has been involved in the building of diesel engines since their invention 100 years ago. Today, Krupp MaK develops and manufactures medium-speed, four-stroke engines, in the power range of 930 to 10,000 kW for main propulsion and electrical power generation duties. In June, Krupp MaK released its latest engine, the M25, with a power range of 1,740 to 2,700 kW.

MAN B&W Diesel AG

Circle 84 on Reader Service Card

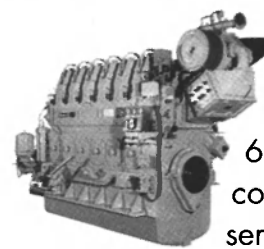
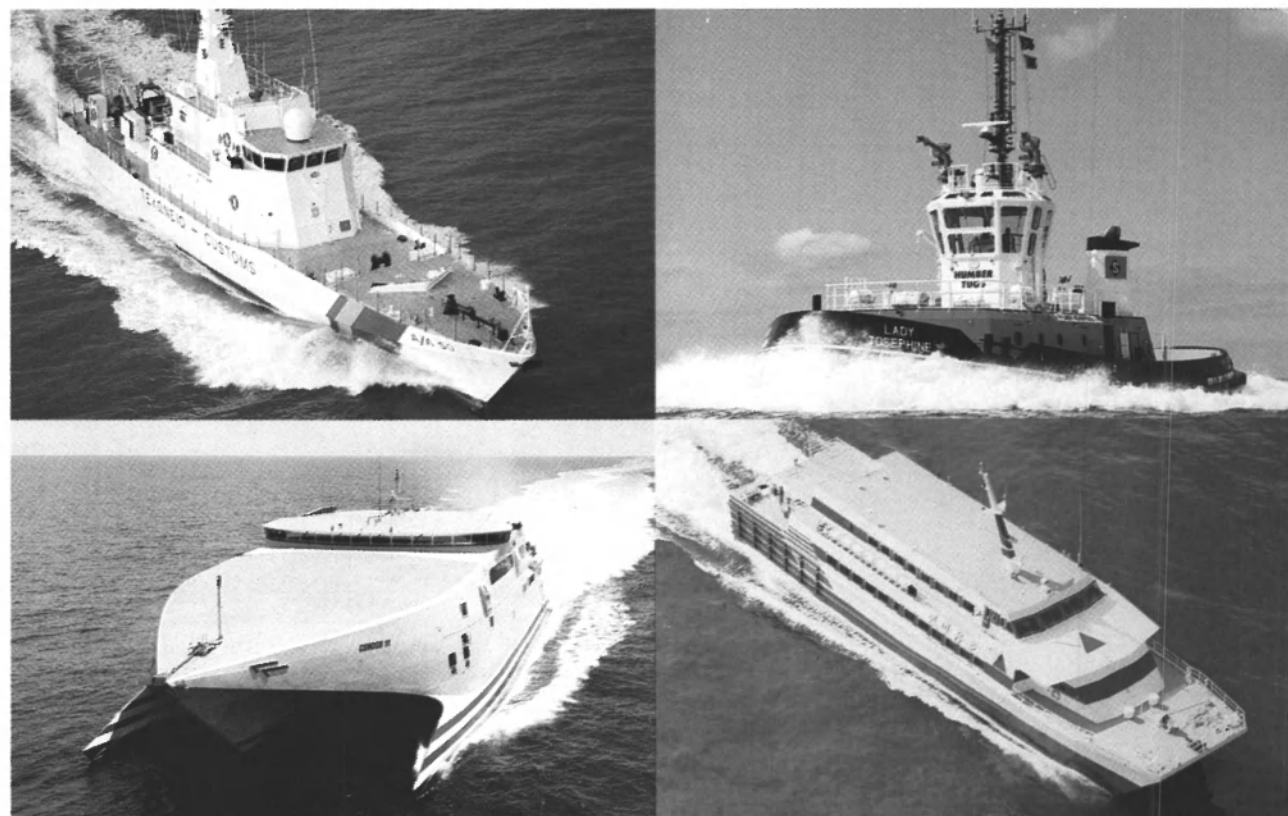
MAN B&W Diesel is building two and four-stroke engines of ratings from 450 to 68,520 kW, a range covering the full scope of applications in the marine (propulsion of power generation) and stationary sectors. By its catalyst technology and with total energy and combined heat and power generation systems for optimized energy exploitation, MAN B&W Diesel contributes to environmental protection and

energy economy in the power generation sector. The environmentally friendly power generation systems reportedly reach primary energy conversion levels of up to 90 percent. MAN B&W Diesel also engages in the development and production of exhaust gas turbochargers and power turbines, as well as oil and gas burners for the private and industrial sectors.

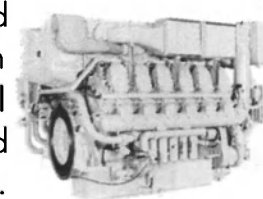
MAN B&W Diesel A/S

MAN B&W Diesel A/S' two-stroke MC engine program covers a wide range of the power pro-

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Diesel Engine Guide

duction scale, from the S26MC, four-cylinder model, which generates 1,600 kW, to the K98MC-C, 12-cylinder version, which generates 68,520 kW. All MC engines can be delivered to comply with the IMO speed dependent NOx limit.

MAN B&W Alpha

MAN B&W Alpha Diesel offers genuine propulsion packages which include all core elements — main diesel engines, reduction gearboxes, propellers and control systems. It offers

packages in power ranges from 1,000 to 12,500-hp.

Holeby Diesel

The marine genset program from MAN B&W Diesel's Holeby Diesel comprises the 16, 23, 28 and 32 series engines, available in power ranges from 500 to 4,000 kW. All units are factory tested and delivered in a ready-to-start state. Further, the units are designed for compactness and ease of installation.

Mitsubishi Heavy Industries, Ltd.

Circle 87 on Reader Service Card
Mitsubishi Heavy Industries offers Marine Star Speed Diesel engines — UEC 33, 43, 60, 75 and 85 LSI series, as well as MET turbochargers for two and four-stroke diesel engines — MET 33, 42, 53, 66 and 83 SE series.

MTU

Circle 121 on Reader Service Card
MTU diesels are liquid-cooled, compact four-

stroke engines. Its program includes the 099, 183, 331, 396, 595 and 1163 series units. MTU's 396 series engines include a six, 8, 12 and 16-cylinder diesels with power ratings ranging from 540 to 2,560 kW. The entire range of the MTU stable spans the power spectrum from 80 kW to 7,400 kW.

New Sulzer Diesel

Circle 76 on Reader Service Card
In the past 18 months, New Sulzer Diesel Ltd. has announced four new marine engine designs and they are now all represented in the company's orderbook. These designs include the first orders for what will reportedly be the world's most powerful diesel engines — the 12-cylinder RTA96C of 89,640 bhp output. Twelve-cylinder engines will power the two 6,674 TEU container-ships recently contracted in Japan, while two 5,750 TEU container-ships also booked in Japan will have 11-cylinder RTA96C engines. Two 8,700-dwt RoRo vessels ordered by Tar Line in Italy, will have the first examples of the new, larger-bore Sulzer medium-speed engine type, the ZA50S. Each ship will be fitted with twin 9ZA50S engines of 20,340 bhp combined output. In addition, there is a growing orderbook for the RTA58T and RTA48T mid-range, low-speed diesel engines. The 42 engines of these types currently on order are for 45,000-dwt open-hatch bulkers booked in Poland; Aframax, Panamax and Handymax bulkers in Japan; and container-ships in the Peoples Republic of China.

S.E.M.T. Pielstick

Circle 81 on Reader Service Card
S.E.M.T. Pielstick ensures design, research and development, manufacturing, sales and after-sales service of its four-stroke diesel engines. The company's product range starts from the PA4 high speed engine with a power of 480 kW at 1,200 rpm and reaches 25,000 kW per unit with the medium speed PC type. With more than 36 million kW in operation worldwide, S.E.M.T. Pielstick is a market leader of four-stroke diesel engines: 3,530 engines on-board merchant ships; 1,250 engines operating in 558 naval vessels belonging to 35 countries; 10 million kW for the production of energy worldwide and 6,200 engines fitted on locomotives and dumpers.

Ulstein Bergen AS

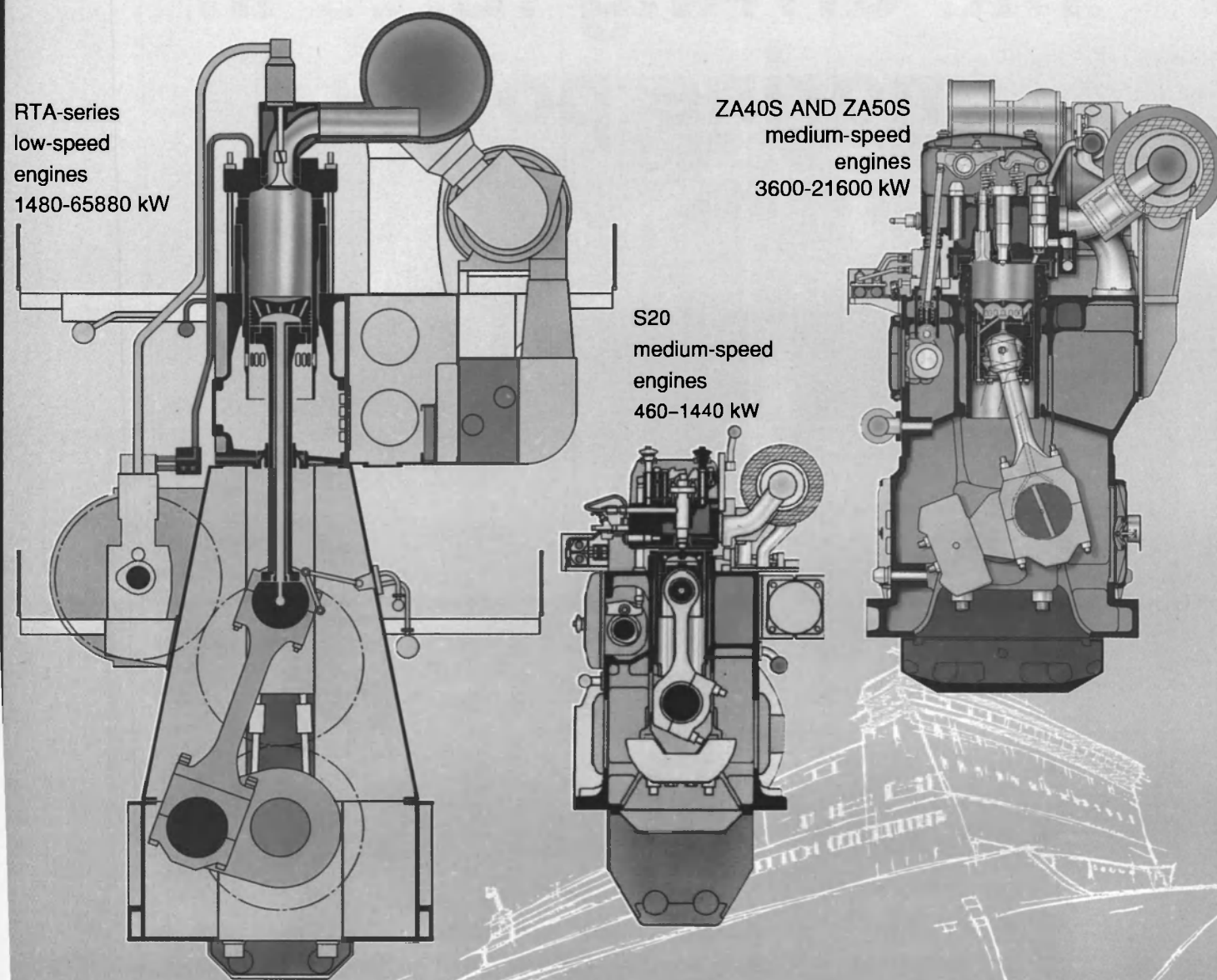
Circle 83 on Reader Service Card
Ulstein Bergen AS manufactures medium speed diesel engines for ship main propulsion and electric power generation. More than 5,000 engines are in operation worldwide in a variety of marine applications. The Ulstein Bergen product range is covered by the K-type engine from 500 to 4,000 kW, and the B-type engine from 2,650 to 4,000 kW. At the end of this year, the BV-type will be introduced, extending the range to 8,000 kW.

Wartsila Diesel

Circle 78 on Reader Service Card
Wartsila Diesel will commence prototype testing on what is reportedly the largest medium speed engine, the Wartsila 64. The new generation of Wartsila Diesel engines has been developed in response to the market's demands for higher efficiency at lower emission levels, combined with further enhanced reliability and reduced lifetime cost.

Other dimensions of Wartsila Diesel's R&D

Dependable power for your ships



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engines
460-1440 kW

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Telefax: (052) 212 49 17

Circle 265 on Reader Service Card

activities include technology projects which aim at developing world-class technologies that can be implemented in Wartsila Diesel engines based on market demands. An example is the antipolishing ring, which has reduced the lubricating oil cost of the engine to one-third, and doubled the cylinder liner lifetime. Another example is the gas diesel technology which has proven very successful in floating production installations. On the emission control side, low NOx combustion has made it possible to meet the coming IMO regulations with all Wartsila Diesel engines, and for most them, a considerable reduction of fuel consumption was achieved simultaneously. The direct water injection technology released in 1995 brings NOx levels down to approximately half the level of the IMO curve. For the stringent regulations, the compact SCR has been developed.

Cummins Marine

Circle 141 on Reader Service Card

In a continuing effort to update its product line, Cummins Marine introduced the enhanced KTA50-M2 as an ideal power choice for a variety of commercial applications. The initial expectation for limited production has already

been exceeded, and engines are now being installed around the world, including Germany, Korea and Southeast Asia. The KTA50-M2 features Centry electronics, which offer adjustable all-speed governing, intermediate speed controls, dual power curves and improved transient response.

Valve Co. Offers Exhaust And Valve Solutions

The Valve Company specializes in the field of diesel engine exhaust and valve operation, as well as maintenance, technical assistance and problem solving. A combination of nimonic valves and the turnomat valve rotators are offered for HFO burning engines. This combination, together with improved cages reportedly leads to increased reliability, prolonged TBO and reduced downtime.

For more information

Circle 90 on Reader Service Card

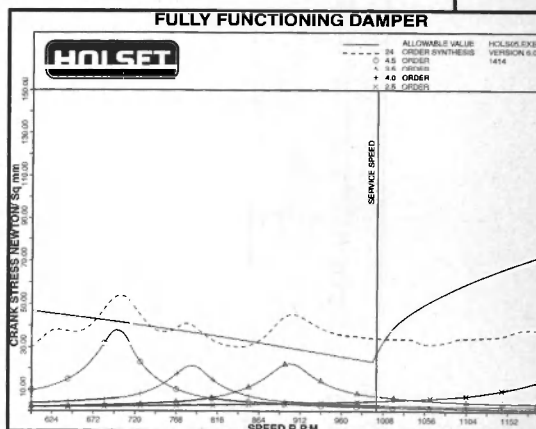
Vibration Damper Maintenance Affects Engine Life Cycle

The complex dynamics and higher engine cylinder excitations of modern diesel engines require dampers for controlling resonant torsional vibration, and for ensuring a long service life. A fully functioning viscous damper works in preventing fatigue or failure of marine propulsion engines and drive trains. Reportedly, more than 50 percent of medium speed diesels and 15 percent of slow speed diesels are fitted with dampers. Most crankshaft vibration dampers use silicone fluid as the damping medium. The damper casing is rigidly attached to the fore end of the crankshaft, and encapsulates an inertia ring. The fluid restrains the internal inertia ring and dissipates vibratory energy as heat through the external surfaces of the damper casing. This provides a cost-effective solution for crankshaft protection, reduced gear wear and lower engine noise. The efficient operation of the viscous damper can be assessed by sampling the silicone fluid within the damper. However, many engineers and maintenance technicians fail to take periodic samples of the viscous silicone fluid for analysis.

Holset Engineering is one manufacturer that provides both test kits and laboratory analysis of damper fluid. Holset Technical Coordinator Terry Howard recommends a laboratory analysis of damper fluid every 15,000 hours of engine operation: "Fluid sampling is the only way to ensure the damper is still detuning or damping the harmful effects of vibratory energy. Neglect it and you could be facing an expensive damper rebuild, or risk serious damage to the engine and drive train." Holset Engineering, located in Cincinnati, Ohio, reportedly developed the viscous damper technology "from its embryo stages in 1952, to being an enabling part of the engine transmission package development over the past 40 years," said Mr. Howard.

For more information on Holset Engineering

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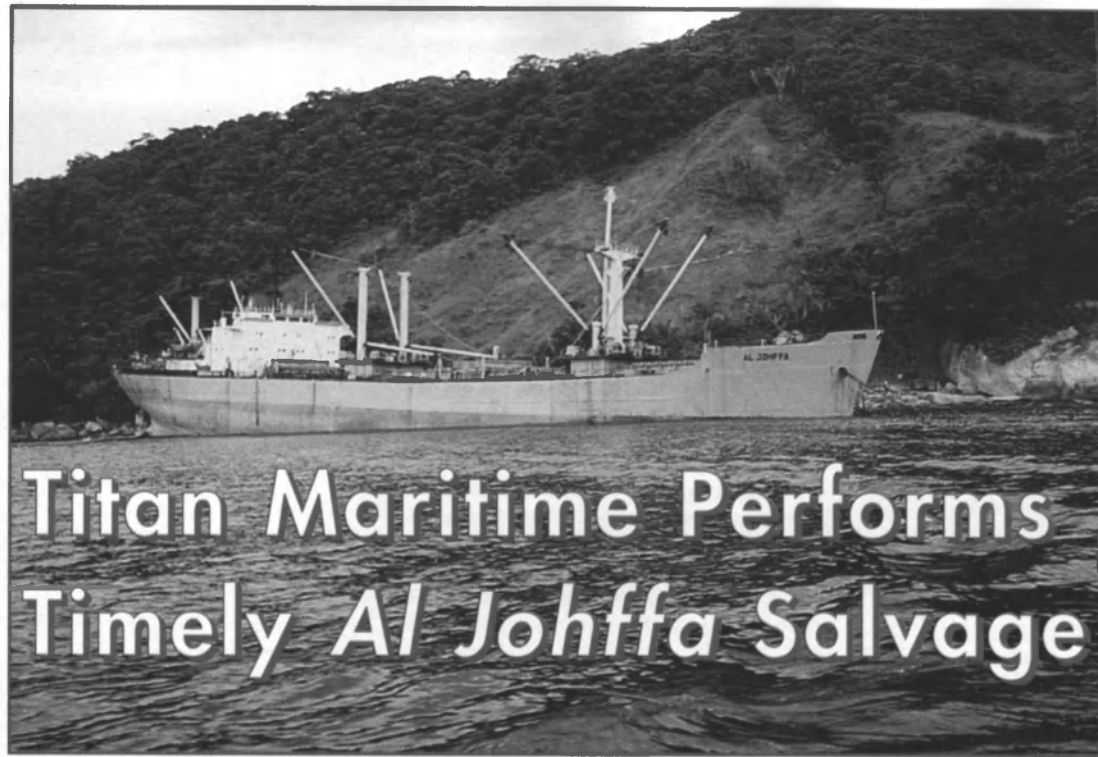
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Titan Maritime Performs Timely Al Johffa Salvage

On February 12, during a storm off the Brazilian coast, 15,000-dwt SD 14 design ship *Al Johffa* went aground in Santos Bay, Brazil, just days before the start of a carnival. Recognizing the danger of having a large oil spill on the beaches during a heightened tourist season, the vessel's owners and their P&I club — Ocean Marine of London — quickly contracted Ft. Lauderdale, Fla.-based Titan Maritime Industries to remove the spilled oil using local equipment and personnel. The contract was let on February 15, and was followed by a scramble to obtain the necessary equipment and a barge to pump to.

The pumping operation began with the use of "spate" pumps and untested plastic suction and discharge hoses, and continued until four days later — by which time 438-cu.-m. of oil and slops had been transferred. During the oil removal, Titan's on-scene Salvage Master Guy Wood performed a dive inspection in order to formulate a plan for salvaging *Al Johffa*.

The ship was lying hard aground on granite for the entire length of its port side, with the number one and two holds tidal, and a slow leak in hold number three. Only three double bottoms were left intact out of 10, and her drafts were approximately 27 ft. (8.2 m) forward and seven ft. (2.1 m) aft. The salvage master reported that there was also a rock pinnacle sticking up three ft. (.9 m) inside the number six double bottom, the shaft tunnel was flooded, and a rock was sticking up about 10 ft.

(3.04 m) inside the number two hold. The minimum water depth on the starboard side was 22 ft. (6.7 m).

Captain Wood decided that refloating would be possible, and removing the wreck by cutting it up would be prohibitively expensive. Despite hiring out of local equipment, a strike in the Brazilian Customs Office delayed equipment transfers from the U.S., and the vessel suffered additional damage — including the settling of the bow three ft. further underwater — resulting from the onslaught of another storm.

A salvage team of 24 workers worked around the clock welding down and bracing tween deck hatches for the number two hold, and sealing the number one hold as the tide permitted. The last hatches welded shut — measuring 30 x 30 in. — were the forward trimming hatches on the port and starboard sides — a task which took two workers two tide cycles to accomplish. On February 19, with the assistance of two local harbor tugs with 2,200-hp each, *Al Johffa* was refloated just as another front passed through the area.

The vessel was taken to be anchored with a skeleton crew and remained for four days in seas of up to 10 ft. (3 m) before waves were calm enough to permit removal of salvage equipment. If the ship had remained aground, she would have undoubtedly broken up.

On February 23, *Al Johffa* navigated to a position 393 ft. (120 m) southeast of Santos. The valves that had been used to pressurize the

Going ... Going ... GONE

Severe hull damage and relentless stormy weather helped decide the ultimate fate of *Al Johffa*.



number one and two holds were opened, bleeding air out and causing the ship to sink by the bow. In the vessel's final moments, her stern stood straight up in the water and the damage to the number six double bottom and tunnel side tanks could be clearly seen.

For more information on Titan Maritime Industries, Inc.

Circle 117 on Reader Service Card

Canadian Mounted Police Boat

Propulsion Notes

MES Delivers Low-Speed Diesel Powerplant To CEM

An international consortium consisting of Mitsui Engineering & Shipbuilding Co., Ltd. (MES) and its fully-owned subsidiary Burmeister & Wain Scandinavian Contractor AS (BWSC) have delivered a 100-MW, low-speed, two-stroke, diesel-driven electric powerplant — one of the most powerful in the world — to Companhia de electricidade de Macau (CEM). The plant consists of two Mitsui-

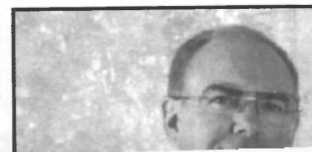
use on the Navy's next generation of surface warships, but could also be applied in commercial ships. A smaller motor aboard ship means more room for other valuable systems for cargo.

For more information on NNS
Circle 94 on Reader Service Card

Pequots Order First Taurus 60M Marine Turbines For U.S. Waters

The Mashantucket Pequot Tribal Council has ordered two 5.2-MW (7,000-hp) Taurus 60M marine gas turbines from Solar Turbines Inc.,

a subsidiary of Caterpillar Inc., to power the first of a line of luxurious, high-speed 330-passenger TriCat ferry boats the Tribe will build in its new Pequot River Shipworks at New London, Conn. The twin gas turbine engines will power waterjet units that can



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Diesel Engine Guide

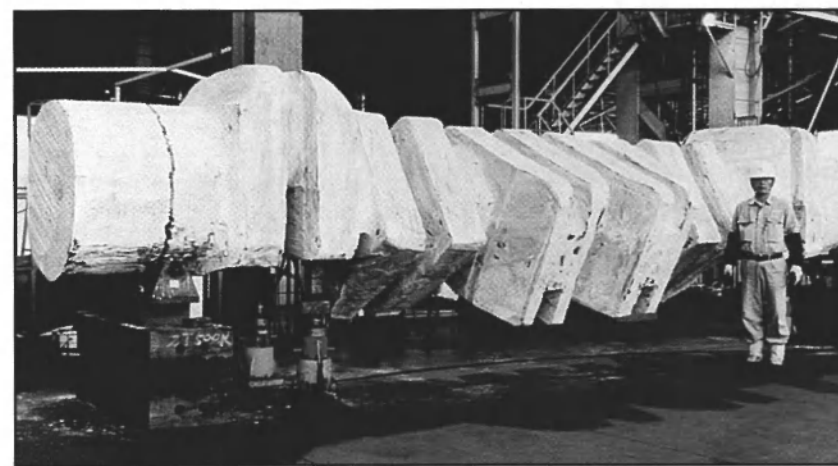
Wärtsilä Designs Largest Medium-Speed Engine

Wärtsilä Diesel, which is now in the middle of a process to upgrade its total engine portfolio, has designed what it terms the world's largest medium-speed engine. Current schedules call for the test engine to be started later this year. Designed in response to market demands for higher outputs and improved efficiency, the new engine — Wärtsilä 64 — will have a cylinder output of roughly two MW/cylinder. Meeting this specification, the in-line version will cover up to 18,000 kW in single engine installation and 36,000 kW in a twin engine installation. The manufacturer assumes that

the V12 will also find a market as a marine engine, which would provide a 48,000-kW output in a twin engine installation. The largest V engines, V16 and V18, have been developed mainly for use in powerplants, but opportunities for very powerful diesel-electric machinery will be explored.

Combined Cycles

The single-cycle efficiency of the W64 will approach 50 percent, but the combi cycle has also been developed, which means that waste heat is used for production of steam to drive a steam turbine. The optimized combi cycle, based



Pictured is the crankshaft forging for a new engine type from Wärtsilä Diesel. The Finnish manufacturer's project aim is to produce the world's largest medium-speed engine.

on the Wärtsilä 64 specifications, is projected to end up at an efficiency rate of 57 to 58 percent. The efficiency rises at higher outputs because the steam turbine efficiency improves with size. For more information on Wärtsilä Diesel Circle 108 on Reader Service Card

Inkster Powered By MAN Engines

operations speed — provides a top speed in excess of 30 knots.

Machinery which provides the vessel's various hotel services is grouped in the void compartments, along with the fuel tanks and compressed CO₂ tanks for engine room fire suppression. This includes a hot water tank, a domestic water pump, a sanitary water pump and a black water macerating pump. A reverse osmosis water making system and a diesel-fired furnace for accommodation heating are installed in the starboard engine room.

The computerized navigation system incorporates an extensive electronic chart database and high level graphics to give constant information regarding the vessel's position, direction and speed. The navigation computer system is also capable of sending and receiving information, including faxes, via the radio telephone modem.

For more information on Allied Shipbuilders Circle 58 on Reader Service Card

Inkster Particulars

Type	.....Catamaran Patrol Vessel
Length, o.a.	.....71 ft. (21.6 m)
Length, b.p.	.....58 ft. (17.8 m)
Breadth, molded	.....22 ft. (6.7 m)
Depth, molded	.....6.5 ft. (1.99 m)
Design draft	.....2.2 ft. (.67 m)
Endurance	.....20 hours @ 25 knots
Maximum speed	.....30 knots +
Material	.....Aluminum
Main engines	.....MAN D2840
Gears	.....ZF BW165
Propellers	.....Rolla (surface piercing propellers)
Drives	.....Arneson ASD 12

Hitachi Zosen To Begin Construction Of New Ariake Machinery Works

In July 1995, Hitachi Zosen Corporation and government officials of Kumamoto Prefecture and the Town of Nagasu concluded an agreement on the construction of the new Ariake Machinery Works. After developing the detailed design of the project under the guidelines of government authorities, the company began construction on the grounds of its Ariake Works on April 15. This facility is to be a replacement for the Sakurajima Works, the company's main machinery factory, located in Konohana Ward, Osaka, Japan. The city of Osaka is carrying out a bay-area redevelopment project in the western coastal area of Konohana Ward.

Since the Ariake Works was inaugurated as a shipyard in 1973, it has been home to advanced shipbuilding technology. Aiming at the 21st century, the company is constructing this new integrated machin-

ery works to extend its heavy machinery operation, giving it the capability to produce both marine and land equipment. In particular, the new works is expected to be a world-leading machinery facility that functions as a primary base in the company's international strategy.

Products to be manufactured by the New Ariake Machinery Works include marine diesel engines, industrial machinery such as presses for automobile production and various kinds of plant equipment. The first order has already been received by the new works — the world's largest marine diesel engines, producing 74,640 PS, ordered by Odense Steel Shipyard Ltd., of Denmark. Full operation of the plant will get under way in October 1997, six months ahead of schedule.

For more information on Hitachi Zosen Circle 66 on Reader Service Card

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Propulsion Notes

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For more information on MES
Circle 91 on Reader Service Card

Lugger Offers Innovative L6140AL2 Diesel Engine

Lugger's L6140AL2 diesel engine is based on the L6140AL, but contains significant changes which reportedly give it more horsepower while maintaining the reliability and efficiency of its predecessor. The new ratings for the 930 c.i.d. (15.24 L) diesel are: high output, 799 hp at 2,100 rpm; medium duty 600 hp at 2,100 rpm; and continuous duty 500 hp at 1,800 rpm. The 700 hp rating is already at work in 32 ft. (9.7 m) Bristol Bay gillnetters in Alaska.

The new model's high output L6140AL2's cooling system features a new, higher capacity, gear-driven jacket water circulation pump. Keel-cooled models have a new centrifugal pump dedicated to the freshwater aftercooler cooling circuit. On heat exchanger cooled versions, a supplemental heat exchanger has been integrated into the aftercooler cooling circuit. Other changes include new connecting rod bearings, 12-hole fuel injection nozzles and turbocharger.

For more information on Lugger
Circle 93 on Reader Service Card

NNS Wins Contract To Design Electric Drive Motor For U.S. Navy

Newport News Shipbuilding (NNS), a division of Tenneco, has won a \$15.6 million contract from the U.S. Navy to design a 25,000-hp electric motor that could lead to future ship propulsion systems. The shipyard is also designing and building a half-size demonstration prototype motor for testing.

NNS is the lead company on the Permanent Magnet Electric Drive Propulsion Motor System project. Other team members are Northrop Grumman Marine Systems of Sunnyvale, Calif., and Kaman Electromagnetics Corp. of Hudson, Mass.

The motor under development is called an Axial Field Permanent Magnet Ship Propulsion System, and reportedly generates as much power as larger conventional motors. It is being developed for

use on the Navy's next generation of surface warships, but could also be applied in commercial ships. A smaller motor aboard ship means more room for other valuable systems for cargo.

For more information on NNS
Circle 94 on Reader Service Card

Pequots Order First Taurus 60M Marine Turbines For U.S. Waters

The Mashantucket Pequot Tribal Council has ordered two 5.2-MW (7,000-hp) Taurus 60M marine gas turbines from Solar Turbines Inc.,

a subsidiary of Caterpillar Inc., to power the first of a line of luxurious, high-speed 330-passenger TriCat ferry boats the Tribe will build in its new Pequot River Shipworks at New London, Conn. The twin gas turbine engines will power waterjet units that can

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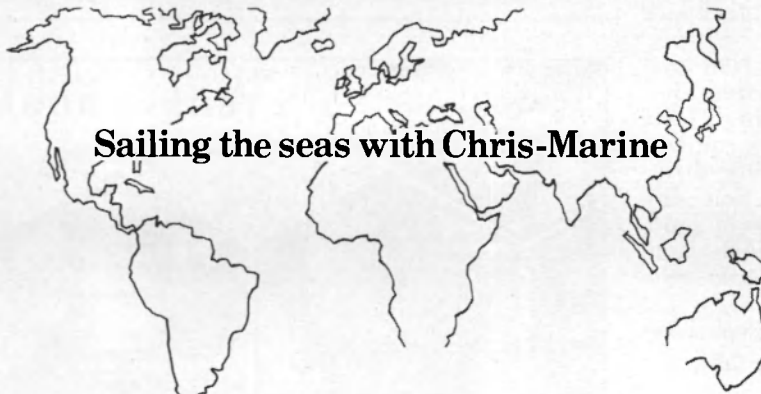
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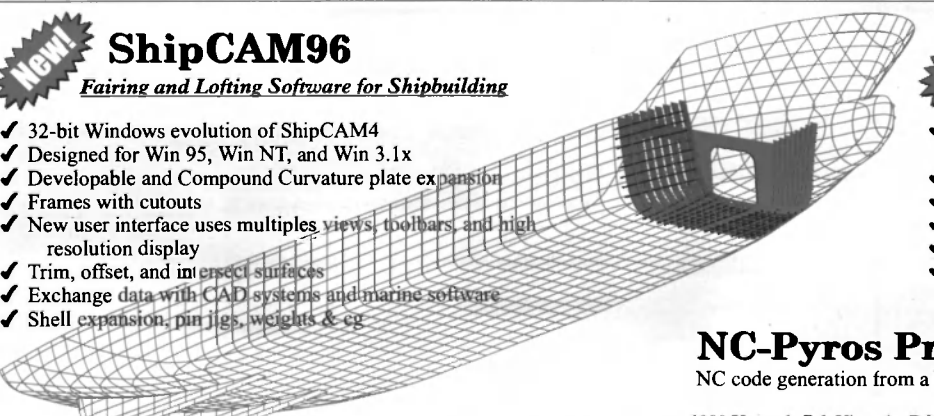
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Circle 301 on Reader Service Card

Propulsion Notes

reportedly propel the boats at speeds of up to 51 knots.

The Tribe plans to buy the first TriCat vessel to be built at the Pequot facility to provide world-class transportation to Foxwoods, the resort casino it owns at Mashantucket in southeastern Connecticut. The boat, which will reportedly be the fastest commercial passenger vessel in North America, will be 147.6 ft. (45 m) long, with a 38.6-ft. (11.8-m) beam and a 4.6-ft. (1.4-m) draft.

The Pequot River Shipworks is a newly created company organized specifically for shipbuilding programs, and is separate from other tribal business enterprises.

Tribal Chairman **Richard A. Hayward** said, "We expect to initially hire 60 employees, many of whom acquired their shipbuilding skills at the Electric Boat Division of General Dynamics in nearby Groton. The firm expects to have an annual payroll in excess of \$2 million."

The Pequots' shipbuilding effort is part of an agreement with the FBM Marine Group. The ship's U.K.-based designer, that gives the Tribe rights to build and sell the high-speed TriCat vessels to customers in North and South America, the Caribbean and Hawaii.

Solar Turbines Inc., based in San Diego, designs and manufactures its gas turbines and turbomachinery systems under quality management systems certified to ISO 9001 standards. Solar Turbines has produced more than 9,500 marine and industrial gas turbines in the 1 to 11-MW (1,350 to 15,000-hp) class for customers in 80 countries, and the turbines have reportedly logged more than 530 million operating hours.

For more information on Solar Turbines
Circle 95 on Reader Service Card

Stork Services Announces Company Developments

Stork Services b.v., a worldwide supplier of diesel engine spare parts specializing in Sulzer and P&W engines, has completed consolidation of operations at its warehouse facilities in Hoogvliet near the Port of Rotterdam. The company had relocated sales and administration from Hengelo earlier this year. Reconditioning facilities remain at the Stork factory in Hengelo, but the exchange pool for repaired pistons, cylinder covers and valve spindles will be relocated to the warehouse. Stock and workshop facilities are maintained in Singapore. **A. Benema**, continues as general manager, and **Michael Kurzer**, formerly with Wilton-Fijenord Shipyard, joined Stork on May 1 as sales manager for the U.S. and Canada.

For more information on Stork Services

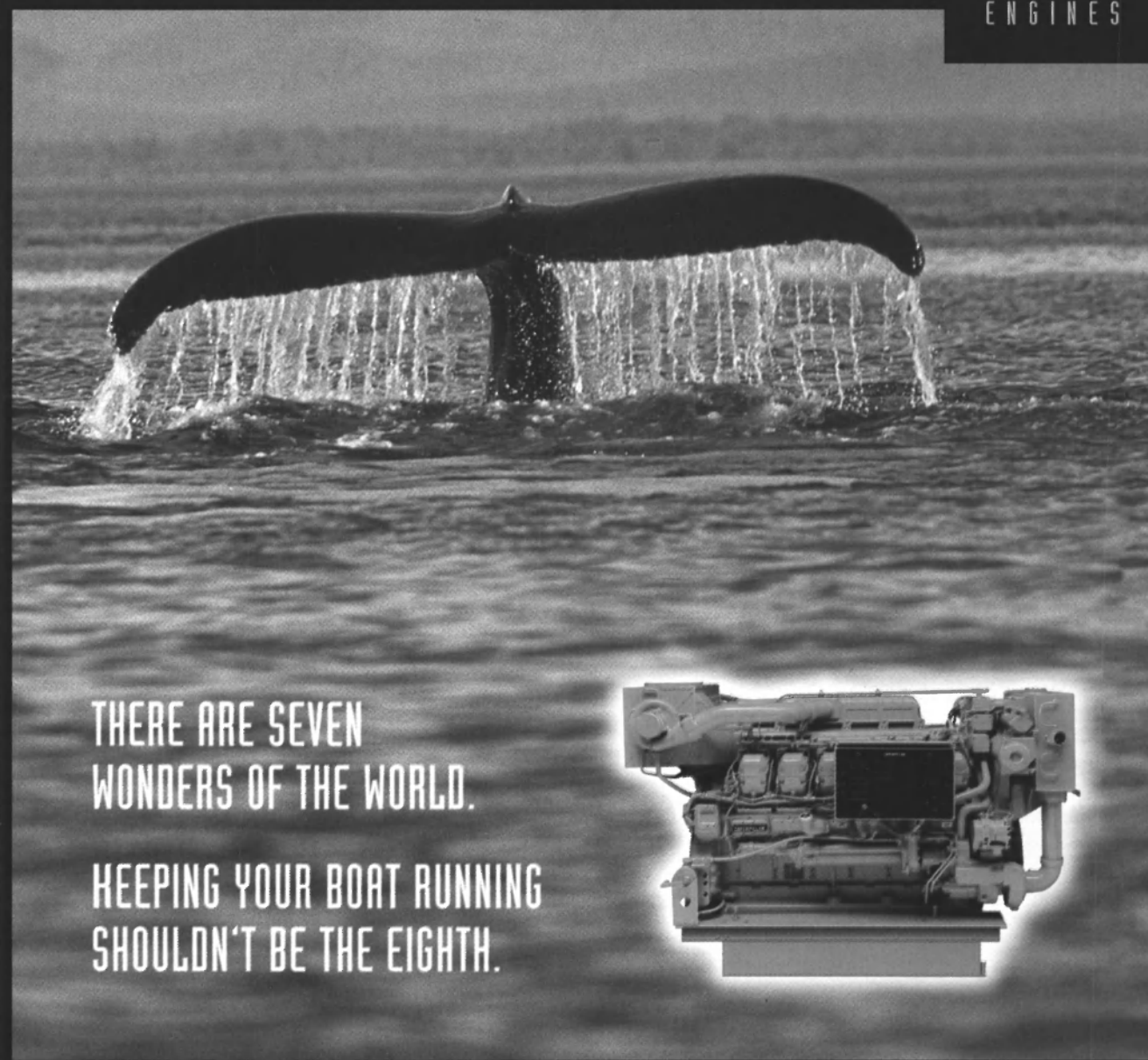
Circle 109 on Reader Service Card
Northrop Grumman Marine Systems Supplies Sulzer Engines For USCG
Northrop Grumman Marine Systems has supplied four 10,000

bhp Sulzer ZA40S diesel engines for a new U.S. Coast Guard (USCG) icebreaker. In January 1996, the company submitted proposals to two U.S. shipyard teams competing for a 12-shipyard program for the new amphibious

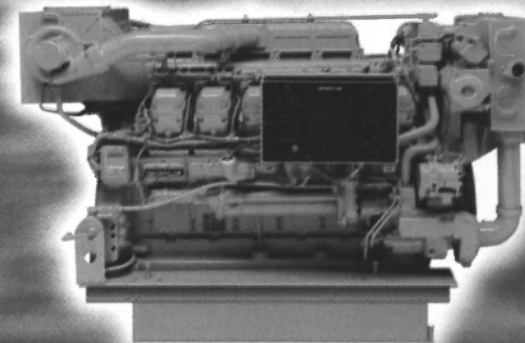
assault ship (LPD 17). The ship award is scheduled for this September. Marine Systems has also proposed the main reduction gears that transmit the propulsion power at an efficient propeller speed.

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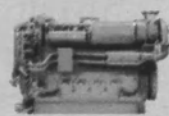


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GKN Westland Secures Canadian Hovercraft Order

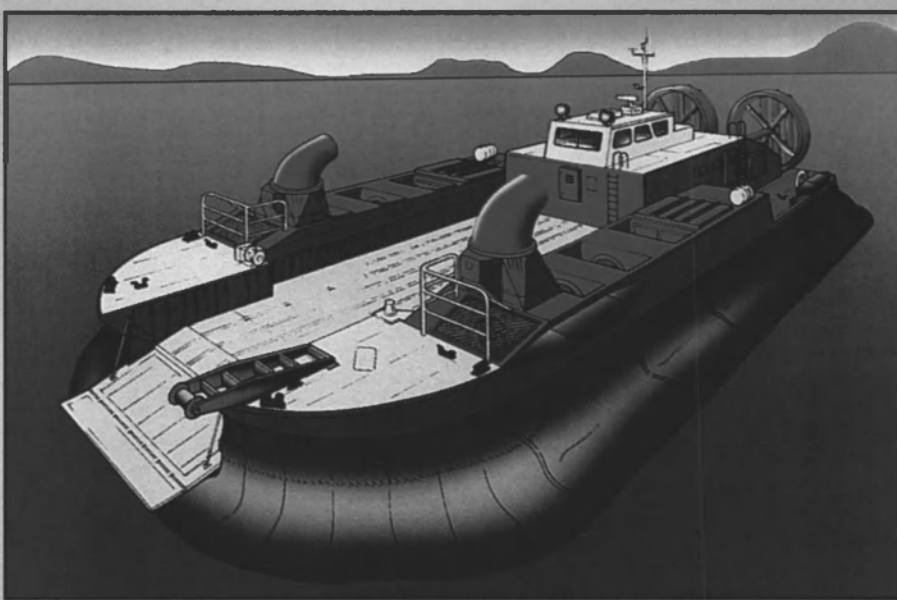
GKN Westland Aerospace, a division of GKN plc, has recently been awarded a contract by the Canadian government for the detailed design and construction of two new hovercraft for the Canadian Coast Guard. As the primary contractor, GKN will undertake the design and management of the project, while Canadian shipyard Hike Metal Products Ltd. will perform vessel construction, and Isle of Wight supplier Hovertravel Ltd. will provide proprietary components and consultancy

advice during the manufacturing process.

The Canadian Coast Guard has reportedly been operating hovercraft built by GKN Westland (previously British Hovercraft Corp.) since 1968. In 1987, a diesel powered, half-well deck AP1-88 was added to the hovercraft fleet, for service on the St. Lawrence Seaway. This craft has performed a wide range of tasks, including the deployment, servicing and recovery of navigational buoys, search and rescue, ice breaking and spill recovery.

The new craft, designated AP1-88/400, is an enlarged version of the model acquired in 1987. The AP1-88/400's freight deck is longer, and at approximately 20 tons, its payload capacity has almost doubled. The first hovercraft is due for completion in March 1998, after which time it will begin operation on the St. Lawrence, along with two SR.N6 GKN Westland-built hovercraft already positioned in the area.

For more information on GKN Westland Aerospace
Circle 138 on Reader Service Card



People & Company News

KVH Hires New Marketing Manager

With more than 10 years of sales and marketing experience, **Cindy Russell** has joined KVH Industries as the company's new Marketing manager. Prior to accepting her new position, Ms. **Russell** was employed by AIRMAR Technology Corp., where she was responsible for developing, marketing and selling transducers to KVH and marine and commercial electronic manufacturers worldwide.

Black Sea Shipyard Names U.K. Agent

The Black Sea Shipyard Rom SA, based at Media Harbour, Constantza, Romania, recently appointed AFJ Marine Services Ltd. of Wimbledon as its U.K. agency for promoting company services in Great Britain.

The yard undertakes major repair work, ship conversion and shipbuilding projects for all vessels up to 65,000 dwt. According to **John Taylor** of AFJ, "The scope of work possible at the yard with respect to the popular panamax and handy-max vessel size provides AFJ with the ability to widen its service provision to vessels in Eastern Europe."

Raytheon Names Duffy Marketing Communications Manager

Raytheon Marine has announced the appointment of **Patricia Duffy** as the company's new Marketing Communications manager. According to **Keith Wansley**, Raytheon Marketing manager, "Patti's strong graphic design background will be a tremendous addition to the Raytheon Marine marketing group." Ms. **Duffy** has owned her own graphic design firm since 1992, serving the creative demands of New England businesses. Raytheon, headquartered in Lexington, Mass., is a \$12-billion company operating in four businesses: commercial and defense electronics;

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Maritime Reporter/Engineering News

engineering and construction; and aviation and major appliances.

Switchcraft, Inc., a Raytheon company headquartered in Chicago, recently named **Mary Higgins** as its Marketing Communications manager, and **Terry Denton** of Comtec in Bellevue, Wash., as its salesperson of the year. Comtec was awarded Switchcraft's Hermes Award for outstanding achievements in the marketing of Switchcraft products.

Crusader Names Marine Marketing/Sales Director

Crusader Engines' President **Chet Janssens** has announced the appointment of **Tom Calhoun** as the company's new director of Marine Marketing and Sales. In his new position, Mr. Calhoun will be responsible for marine sales management, marketing and advertising programs and trade show exhibits. In the past, he has been employed as the director of Marketing for several yacht companies, including Mainship/Luhrs, Baron Yachts and Stamas Yachts.

JJMA Opens New Technical Support Office

John J. McMullen Associates, Inc. (JJMA), a firm of naval architects, marine engineers and transportation support specialists, has recently opened a new office in Pittsburgh, Pa. This new office will provide the company with additional expertise in the field of machinery design, operation, maintenance and repair, as well as machinery component design. The newly acquired professional staff of 60 engineers are experienced in control systems; electrical and fluid systems; and marine, mechanical, naval and structural engineering — complementing the firm's already established capabilities in ship design and integration.

ACBL Announces New Appointments

American Commercial Barge Line Co. (ACBL) has hired **Dianne Gibson** as the company's new Quality/Planning assistant. **Diane M. Banic** was also recently named to the position of professional development manager.

Lang Named VP At DEL NORTE

Mike Lang has been appointed to the position of vice president of operations at DEL NORTE Technology Inc.'s U.S. affiliate, where he will oversee production, engineering, sales and international activities of the organization, a leading manufacturer of precise

positioning systems for marine applications.

In the past, Mr. Lang served as a radio/electronics specialist in the Royal Navy, and worked for several navigation-related companies before setting up the DEL NORTE company in the U.K. nine years ago.

Moran To Direct AWO's Legislative Outreach Program

John A. Moran, an attorney with nearly a decade of experience as a congressional staff counselor

in both houses of Congress, has joined the American Waterways Operators (AWO) as vice president of Legislative Affairs. Mr. Moran succeeds **Curtis Whalen**, who has left the agency to pursue advocacy work in the energy field.

During his service as a congressional staff counselor, Mr. Moran's

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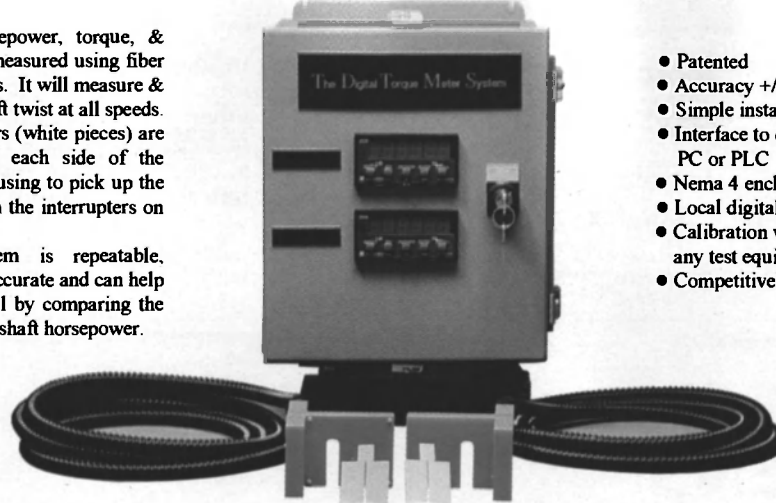
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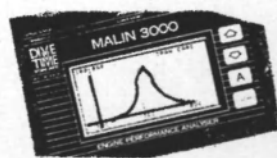
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People & Company News

legislative work included a focus on OPA 90 implementation, as well as maritime reform and fisheries legislation. He has held the following posts: minority counsel for the Senate Committee on Commerce, Science and Transportation (1990-94); legislative counsel for Virginia Senator **John Warner** (1986-87); and minority counsel for the Senate Committee on Merchant Marine and Fisheries (1986-87).

"I'm very pleased to have joined such an outstanding team of professionals, and I intend to use this opportunity to continue the recent progress inspired by the association's strategic plan, AWO 2000," said Mr. **Moran**.

Austal Opens Toyko Office

Australian fast ferry builder Austal Ships has announced the opening of a regional office in Tokyo, building upon the success of delivering its first fast ferry to Japan's Diamond Ferry Co. Ltd. in 1995. According to Chairman and Managing Director **John Rothwell**, "Austal has dedicated great time and resources to understanding and working with Japanese regulatory authorities. The market is substantial and the new office is already proving an important link in promoting

VT Delivers Fast Strike Craft



Vosper Thornycroft (U.K.) Ltd.'s (VT) project to build four fast strike craft for the Qatar Emiri Navy reached a milestone with the handover of the first-of-class vessel *QENS Barzan* at Portchester Shipyard on May 9. The 183.7-ft. (56-m) ship was formally accepted by Brigadier General **Said Al Sowaidi**, commander of the Qatar Emiri Naval Forces, who stated: "Many shipyards in Europe declined such a challenge to build a platform that is so advanced with so many state-of-the-art features. But I am glad that VT accepted it. They have built what they promised and consequently I would like to see a continuing relationship between my navy and British industry."

QENS Barzan is propelled by four MTU diesel engines, each driving through a reverse/reduction gearbox into a fixed propeller. The vessel is also equipped with VT's new advanced machinery control and surveillance system. VT is scheduled to deliver the second vessel of the series, *QENS Hawar*, later this year. The third vessel, *QENS Al Udeid*, was launched in March and the final vessel will be launched in August.

For more information on Vosper Thornycroft
Circle 137 on Reader Service Card

Maritime Reporter/Engineering News

opportunities for further export sales to Japan."

Toyohiko Kobayashi, a former director of the Marubeni Machinery & Engineering Corp., is managing Austal's Tokyo office.

Jastram Engineering Relocates

Jastram Engineering, a Canadian manufacturer of marine hydraulic steering systems, has relocated to new premises. The company now resides at 467 Mountain Highway, North Vancouver, B.C., Canada V7J 2L3. The telephone and fax have remain unchanged, tel: (604) 986-0714; fax: (604) 986-0334.

Selber Joins Newport News Nuclear

Newport News Nuclear, a division of Newport News Shipbuilding, announced that **Arlene B. Selber** has joined the division as vice president of Business Development. Newport News Nuclear is pursuing contracts with government agencies and involvement in international projects, as well as is expanding its existing commercial nuclear powerplant repair and maintenance work.

Ms. Selber has a strong background in environmental remediation and waste management, as applicable to Department of Energy projects. Her most recent position was with Parsons Engineering Science, Inc., where she served as vice president of Corporate Business Development.

Marine Electronics Solutions To Rep For Six Companies

Marine Electronics Solutions, Inc., based in Jacksonville, Fla., has been named the manufacturer's representative in the Southeast and Gulf regions of the U.S. for six companies, namely: Transas Marine; Marisys, Inc.; Mitel-Marine Adaptive Systems; Norselght/Kockum Sonics; Seiko Marine Clock Systems; and Sunair Communications. The company supports electronics requirements of the marine industry, offering systems integration, bid preparation, procurement and technical support.

Southwest Marine Promotes Two Top Execs

San Diego-based yard Southwest Marine Inc. (SWM) has promoted **Edward Ewing** to the position of president and COO of SWM's San Diego, San Pedro and Ingleside, Texas, divisions. Additionally, on the successful acquisition of

Continental Maritime of San Diego — expected to take place this summer — he will also serve as president and COO of this neighboring facility.

After serving as SWM's president and COO, **Herb Engel** has been named vice chairman of the board

of SWM. He will also act as president of San Francisco Drydock, an affiliated repair company in the Bay Area; Southbay Boat Yard in Chula Vista, Calif.; and SWM's American Samoa division. Both executives report directly to **Arthur Engel**, SWM's chairman

of the board and CEO.

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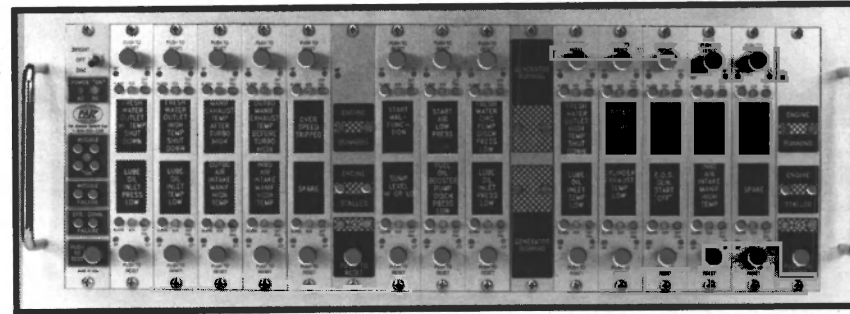
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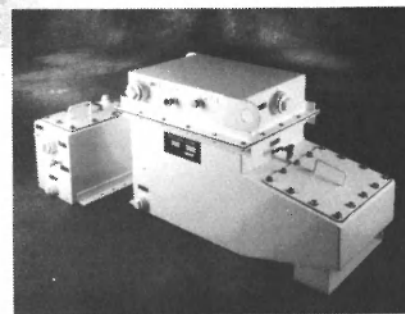
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61

(AOTOS) Award recipients for 1996 were recently announced. Vice Admiral **Albert J. Herberger**, administrator of the Maritime Administration, and **C. Bradley Mulholland**, president and CEO of Matson Navigation Co., Inc., have been selected to receive these honors at a gala event to be held at the Sheraton New York Hotel and Towers in New York City on November 8.

This announcement was made by **John Bowers**, chairman of the USS AOTOS Committee, and president of the International Longshoremen's Association, AFL-CIO, on May 22 — Maritime Day. Last year's award recipients were Senator **Trent Lott** and **James Barker**, principal owner of Interlake Steamship Co., Moran Transportation Co. and Mormac Marine Group.

Top Execs Named At OMI Petrolink

On May 24, **Jack Goldstein**, chairman and CEO of OMI Corp., announced the election of **Robert W. Carson** to the presidency of OMI Petrolink. Mr. Carson was previously employed as vice president of Operations for the company. It was also announced that

Peter A. Barton has been elected to the position of executive vice president. Before accepting his new position, Mr. Barton served as vice president, Chartering.

OMI Petrolink is a Houston-based company which provides lightering and related services for large tankers in the U.S. gulf. OMI Corp., a major domestic bulk shipping company, operates in both the international and domestic shipping markets, with a fleet of 39 vessels.

AAPA Announces Staff Promotions

Kurt J. Nagle, president of the American Association of Port Authorities (AAPA), recently announced the promotions of three staff members. **Jean Godwin**, former vice president of Government Relations, is now senior vice president for the organization. In addition to her role as a lobbyist representing the interests of U.S. ports before Congress, the Clinton Administration and federal agencies on legislative and regulatory issues, Ms. Godwin is responsible for corporate records.

Tony MacDonald, former director of Environmental Affairs, was promoted to the position of special counsel and director of the department. He also currently serves as chairman of the Dredging Task Force for the International Association of Ports and Harbors.

J. Scott Rainey was promoted from Government Relations representative to director of Membership Services. He will administer a wide range of membership services activities, including coordinating and marketing AAPA's education and training programs, Spring Conference and Annual Convention.

Chevron Awards Contract For Platform Construction And Installation

Spars International Inc., a joint venture between J. R. McDermott and Aker Oil and Gas Technology, has been awarded contract by Chevron U.S.A. Production Company for the fabrication and installation of the Genesis spar platform, a deepwater development in the Gulf of Mexico. The contract is valued at approximately \$300 million with McDermott and Aker each responsible for approximately half of the project under subcontract to Spars International. McDermott will install the Genesis spar in 2,600 feet of water in Green Canyon 20, about 150 miles southwest of New Orleans, in the summer of 1997. Fabrication of the platform's deck will begin this fall at McDermott Morgan City facility in Louisiana. Engineering will be provided by McDermott Engineering Houston. Aker will fabricate the platform hull in Finland.



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<p style="text-align: center; font-weight: bold; font-size: small;">MONDAY 9TH SEPTEMBER</p> <p style="text-align: center; font-weight: bold; font-size: small;">ORGANISERS' WELCOME COCKTAIL PARTY, BELL HARBOR</p> <hr/> <p style="text-align: center; font-weight: bold; font-size: small;">TUESDAY 10TH SEPTEMBER (DAY ONE)</p> <p style="text-align: center; font-weight: bold; font-size: small;">OFFICIAL OPENING BY ARNOLD WITTE PRESIDENT, INTERNATIONAL SALVAGE UNION</p> <p>Paper 1 Inaugural Paper Thomas Allegretti, President, American Waterways Operators, USA</p> <p>Paper 2 Salvage in the Year 2000 Klaas Reinigert, Scaldis BV, Belgium</p> <p>Paper 3 "You Want Our Business - Do It Right" Ron Fletcher, P&O, Australia</p> <p>Paper 4 Salvage Evidence David Hancox and Bill Milwee, Australia and USA</p> <p>Paper 5 Commercial Cargo Recovery in Deep Water - Present and Future Moya Crawford, Deep Water Recovery, UK</p> <p>Paper 6 Escort Tug Performance Results Steve Scatzo, Foss Maritime, USA</p> <p>Paper 7 Emergency Towing Equipment P Torriglia, Studio Tecnico Torriglia, Italy</p> <hr/> <p style="text-align: center; font-weight: bold; font-size: small;">WEDNESDAY 11TH SEPTEMBER (DAY TWO)</p> <p>Paper 1 'Recycled Tugs - A Blessing or a Curse?' Jack Gaston, Author and Journalist, UK</p> <p>Paper 2 Reform of Salvage Law and Salvage Arbitration Procedures Richard Olsen, Stephenson Harwood, UK</p> <p>Paper 3 UK Government Salvage and Recovery - Who Does it and Why? David Keogh and Captain Morgyn Davies, MOD, UK</p> <p>Paper 4 A Tale of Three OPA '90 Tank Barges John Waterhouse, Elliott Bay Design Group, USA</p> <p>Paper 5 Marine Response Alliance Gary Faber, Crowley Marine Services, USA</p> <p style="text-align: center; font-size: small;">An Afternoon of Tug and Salvage Displays and Demonstrations Cocktail Party hosted by the Port of Seattle</p>	<p style="text-align: center; font-weight: bold; font-size: small;">THURSDAY 12TH SEPTEMBER (DAY THREE)</p> <p>Paper 1 How Deep is the Catenary? Marine Insurance Coverage Issues for the '90s Hank White, Barger & Wolen, USA</p> <p>Paper 2 Escort Tugs - Performance Comparisons Gerry Banks, Clyde Consultants, UK</p> <p>Paper 3 Japanese Salvage Scene Y Ogawa, Nippon Salvage/Tony Miller, Constant & Constant, Japan and UK</p> <p>Paper 4 Strategic Terrain for the Towage Industry in the 21st Century Brent Dibner, Mercer Management, USA</p> <p>Paper 5 Is the Salvage Industry Geared up for the 21st Century? Hans Walenkamp, Smit International, The Netherlands</p> <p>Paper 6 Title To Be Advised Tony Nunn, The Institute of London Underwriters, UK</p> <p>Paper 7 Escort Tug Computer Simulation - Standards and Advances Duane Laible and David Gray, The Glosten Associates, USA</p> <p>Paper 8 OPA '90 - Response or Prevention? The European Perspective Hans van Rooij, Wijsmuller BV, The Netherlands</p> <p style="text-align: center; font-weight: bold; font-size: small;">GALA DINNER</p> <hr/> <p style="text-align: center; font-weight: bold; font-size: small;">FRIDAY 13TH SEPTEMBER (DAY FOUR)</p> <p style="text-align: center; font-weight: bold; font-size: small;">FORUM ON STANDBY TUGS</p> <p>Moderator Captain Ken Ross, Australia</p> <p>Panelists Jim Shirley, Attorney, Haight Gardner, USA Rob Allan, Naval Architect, Robert Allan Limited, Canada Hans van Rooij, Wijsmuller Salvage BV Rear Admiral J C Card, US Coastguard Michael A H Turner, Canadian Coastguard Washington State Representative Press Representative</p> <p style="font-size: x-small;">The Organisers reserve the right to amend the Programme without notice.</p>
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To receive a Registration Brochure or obtain bound Conference Proceedings or details on Exhibit Space, please contact: ITS '96 Secretariat, The ABR Company Limited, 19 Bridge Road, Hampton Court, East Molesey, Surrey KT8 9EU, U.K.
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Cegelec To Install Winch Control System On USCG Cutter

A subcontract to design and install an integrated science winch control system on the U.S. Coast Guard (USCG) polar icebreaker and research cutter *Healy* has been awarded to the Marine Systems Division of Cegelec Project. Designed to reduce maintenance, training and spares handling, the new winch control systems incorporate Cegelec's Gem 80/400 controllers, I/O hardware and GE ladder application software. This subcontract was awarded by the winch manufacturers, InerOcean Systems Inc. of San Diego, which is the prime contractor to Avondale Industries Inc.

The science winches will be used to stream and recover instruments on cables up to 14 km long, and transmit information to data gathering equipment onboard the vessel. The data will then be passed to the laboratories on the ship or transferred ashore by data links for analysis. The winch control system and its processors will be fully integrated, allowing the machinery plant control and monitoring system access to the data collected. Cegelec Projects is the project engineering arm of Alcatel Alsthom.

Vosper Thornycroft Secures Vicam Fast Ferry Order

Vosper Thornycroft Controls Division, part of Vosper Thornycroft Shipbuilding (VT), has reportedly secured orders for its already successful Vicam alarm and monitoring system. U.K. shipbuilder FBM Marine is to fit Vicam on the latest batch of TriCat fast ferries for operation in the Far East. The order for three systems, with an option for two further ship sets, follows the installation of Vicam systems on a similar series of five, 147.6-ft. (45-m) TriCat ferries already in service on the Hong Kong to Macau route.

Vicam is a commercial, off-the-shelf system developed from VT's experience in providing control and surveillance systems for warships worldwide, including the U.K. Royal Navy's latest type 23 frigates and Trident submarines. The system has also been fitted to conventional RoRo ferries and to one tug. The TriCats, with capacity for more than 300 passengers, are powered by two Solar Taurus gas turbines driving KaMeWa waterjets. Operation is entirely from the bridge with machinery spaces unmanned. A central display workstation (CDW) on the bridge, containing a high resolution color graphics display, provides the main deck control position for

these systems. Data Collection Units (DCU) located in the machinery spaces interface with sensors and actuators and are linked to the CDW by a dual redundant data bus. CDW displays include graphic, text, trend and schematic pages.

For more information on Vosper Thornycroft
Circle 56 on Reader Service Card

Mustang Wins Contract

Mustang Survival, the Canadian manufacturer of personal survival products supplies the Canadian Navy with personal flotation devices, ranging from inflatable lifejackets to shipboard parkas. Mustang has recently won a \$500,000+ contract to supply the Canadian Navy with more than

3,000 off-the-shelf flotation coveralls. The MS-185 style was reportedly chosen for its comfort, durability and in-water performance. The large order reflects the Canadian Navy's requirement for standard issue suits on City-class frigates. Other Navies reportedly using the MS-185 or testing for use are Australia, Chile and Taiwan.

For more information
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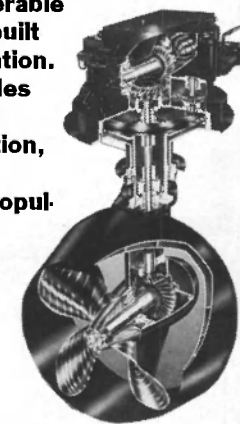
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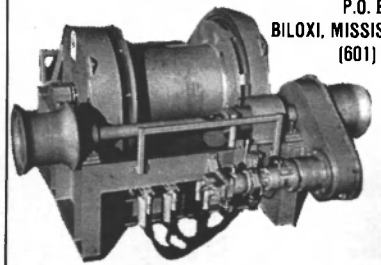
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Circle 254 on Reader Service Card

DRBA Invests Millions To Revamp Ferry

by Nina D. Miller, assistant editor

After a \$27-million, 15-month refurbishment project, M/V *Twin Capes* returned to the Delaware River and Bay Authority (DRBA) ferry fleet, and took its inaugural cruise on May 25. The fleet, comprised of M/V *Twin Capes*, M/V *Delaware*, M/V *New Jersey* (all sisterships built in 1974 at Todd Shipyard, Houston, Texas), M/V *Cape Henlopen* and M/V *Cape May* (sisterships built in 1981 and 1985, respectively, at Norfolk Shipbuilding, Norfolk, Va.), carries more than 1.2 million passengers annually on the 17-mi., 75-min. journey between Cape May, N.J., and Lewes, Del.

While all five ships carry 100 cars, *Twin Capes* can now hold 1,000 passengers — 200 more than each of the other members of the fleet. The vessel's mechanical and safety equipment were updated with new, state-of-the-art technology, including an airplane-style evacuation chute system designed by Dunlop-Beaufort, Inc. of Vancouver, B.C. — reportedly the first of its kind to be installed on a ferry in the U.S. In addition, two elevators connecting the car deck to the passenger decks were added. *Twin Capes* now offers two levels of dining onboard — a restaurant and foodcourt service. The vessel also features a 100-seat, glass enclosed dining area with provisions for live entertainment. Other amenities of *Twin Capes* include a gift shop, children's play area, sun deck, traveler information center and two additional passenger lounges. To allow for this refurbishment, the old passenger salon, second deck and pilothouse were removed, leaving the car deck and hull. An entirely new superstructure consisting of four decks was constructed onto the hull of the ship, in essence, creating a new ferry.

According to Jim Salmon, public information officer at DRBA, the organization realizes the operation of the ferry is very seasonal — generating most, if not all of its profit between May and September. "This is a tourism and vacation business, as well as transportation," said Mr. Salmon. With the revamped *Twin Capes*, DRBA hopes to broaden the scope of its ferry service. *Twin Capes* is now a setting for corporate affairs, weddings and other catered



events.

On May 18-19, after the evacuation chute system passed U.S. Coast Guard testing, *Twin Capes* set sail on trial voyages which carried a combined total of 1,500 passengers for both days. "The response has been good, but we won't realize the full magnitude until the busy season," said Mr. Salmon. Nonetheless, 1,200 reservations were made for *Twin Capes* within a two-day period following these excursions.

In all, 1,200 guests were invited to attend the inaugural cruise on May 25, including local area business leaders, dignitaries and members of the press. The passengers embarked for a four-hour cruise from Cape May at 3 p.m., and then enjoyed an evening of dinner, dancing and a tour of the vessel. The first customers rode the vessel on May 26, and on June 14, *Twin Capes* commenced seven-day per week operation.

Delaware underwent less extensive renovations in 1994, which provided the ferry with a lido deck, food court and air-conditioning. According to Mr. Salmon, the next vessel due for renovation is *Cape May*, which will undergo a \$13-14 million restoration in October, putting it in a class between *Twin Capes* and *Delaware*.

Twin Capes Refurbishment facts

Navigation system	Sperry Marine
Superstructure removal/steelwork reconstruction	Newport News Shipbuilding
Vessel outfitting and machinery	Norshipco
Interior outfitting	Jamestown Metal Marine
Evacuation chute system	Dunlop-Beaufort, Inc.
Interior furniture	Vemo-Mobel

Heger Dry Dock To Present Dockmaster's Training Seminar

Heger Dry Dock Engineers, Inc. will host a Dockmaster's Training Seminar to be held at the Norfolk Waterside Marriott, Norfolk, Va. The seminar will run from September 17-20, 1996, and is designed to present the latest information on drydocks and drydocking techniques to dockmasters, naval architects and others involved with the drydocking of vessels.

Subjects to be covered during the seminar include: drydock accidents; types of docks; ship characteristics important to drydocking; calcu-

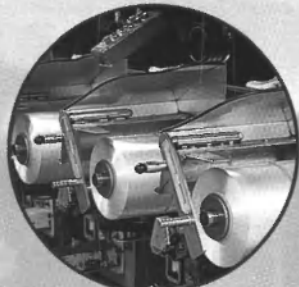
lating block loads; stability of ships and ship/dock systems; blocking; docking plans; docking procedures; vessel handling; pumpir plans; drydock inspection; rating of drydock case studies; and typical predocking calculations required for U.S. naval vessels. Robert Heger, president and chief engineer of Heger Dry Dock, will be the instructor of the course. Mr. Heger has more than 18 years of experience in the drydocking industry. He has presented similar seminars to the U.S. Coast Guard, U.S. Naval Reserves, U.S. naval personnel, Canadian naval personnel and personnel from most major U.S. commercial shipyards. For information call: (508) 429-1811.

Maritime Reporter/Engineering News



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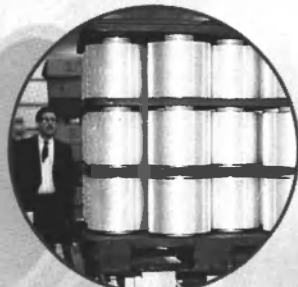


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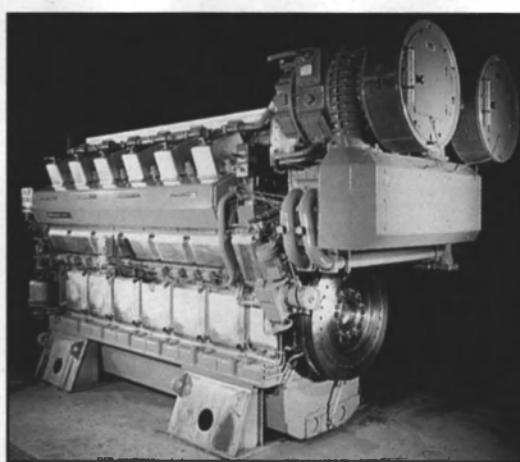
Circle 234 on Reader Service Card

Wärtsilä Engines To Power New Alaska Ferry

Wärtsilä Diesel received an order from Trinity Marine Group's Halter Marine Inc. for a pair of Wärtsilä 12V32 main engines to power a new passenger/vehicle ferry for the Alaska Marine Highway System. Wärtsilä will also provide project management and support from its offices in Annapolis, Md., and Vasa, Finland, as part of the contract. The engines, to be built at the company's Vasa facility, are due for delivery in December. The new Alaska ferry is the first oceangoing passenger vessel to be built in the U.S. in more than 40 years. It will measure 380 ft. (116 m) long and will have a capacity for 750 day cruise passengers. In addition, it will have a RoRo capability, able to carry 120 vehicles.

According to the Alaska Department of Transportation and Public Facilities, Alaska's governor is committed to investing \$120 million per year over the next 12 years to upgrade Alaska's national highways, which also include the Marine Highway system.

The Vasa 32 engine is proven diesel engine technology designed to operate over the entire load range, using anything from the poorest quality heavy fuels to gas oil, crude oil and nat-



ural gas.

New orders for Stolt Tankers

Wärtsilä also reported receiving an order from INMA Shipyard in Italy for the propulsion equipment for the first two of four new 5,000-dwt diesel-electric, chemical parcel tankers for

Stolt Chemical Tankers of Houston. In addition to providing four Wärtsilä 6L20 Heavy Fuel Oil engines per ship, the company will supply an electronic support system package FAKS (Fault Avoidance Knowledge System) and ELDOC (Electronic Documentation). With this order, Wärtsilä Diesel is now supplying a total of 48 engines for the 12 new diesel-electric chemical tankers that Stolt is having built at three European shipyards.

For more information on Wärtsilä Diesel
Circle 20 on Reader Service Card

Design On New High Speed/Low Wake Catamaran Ferry Completed

Halter Marine Inc. of the Trinity Marine Group, in conjunction with the Advanced Research Projects Agency has completed the design development for the Trinity E-CAT, or environmental catamaran. The high speed/low wake passenger service vessel is designed as a cost-effective, high-speed ferry for passengers in wake sensitive areas. These performance parameters are reportedly attainable while transporting 300 to 500 passengers at speeds of 40 knots.

The E-CAT concept is designed as a flexible vessel, to meet customer requirements. For example, it can be varied from 25 to 40 tons and the propulsion system can be powered by diesel engine or gas turbine arrangements. In addition, waterjets or propellers can be fitted.

The new design was extensively tested in a model basin under a variety of hull configurations and sea conditions. Two independent engineering firms verified the basin results through the application of computer modeling called Computational Fluid Dynamics.

For more information on the new design
Circle 60 on Reader Service Card

PC Maritime Launches PC-Based Training Programs

The second version of Navmaster, an electronic charting system — being used onboard vessels as an aid to navigation and as a passenger information system — is also reportedly attracting interest from land-based organizations.

The program — *Safe Passage: Preventing Collisions at Sea* — is a multimedia teaching and testing software covering the International Collision Regulations. Reportedly in line with revised STCW requirements, *Safe Passage* incorporates a system for recording student performance in the form of a test module designed to be administered under supervision for formal evaluation and certification.

Safe Passage was developed in Australia in conjunction with the Royal Australian Navy, and contains an animated depiction of all 37 Rules, brought to "life" via 50 movie clips and voiced-over instructions.

From software developer PC Maritime, *Safe Passage* is a pre-cursor to its companion "Rule of the Road" simulator — *Officer of the Watch* — a program which requires users to put knowledge of rules into practice.

Two additional programs — *Stability for Ship Operations* and *Stability for Naval Vessels* — are computer-based training programs designed to teach and test users on the subject of stability. Developed in the U.S., the programs use interactive graphics, animation and questioning routines to deliver an effective training package. Structured exam sessions are based on the U.S. Coast Guard's third mate to captain's license, with the addition of questions used throughout the U.S. Navy's Damage Control Schools.

For more information on the systems
Circle 15 on Reader Service Card



Wind-Driven Turbine Generator Installed On Offshore Platform

French turbine manufacturer Vergnet has produced and installed what is reportedly the first wind-driven turbine generator on an offshore platform. Two Vergnet GEV 5.5 wind turbines were installed on each of two unmanned gas recovery platforms in the North Sea on Amoco Oil Company's Davy and Bessemer Fields, approximately 37 miles off Great Yarmouth, England. The use of wind turbines to power these remote platforms in the North Sea environment reportedly provides sufficient electrical energy to operate the platforms through battery storage. Consequently, refueling and maintenance frequency has reportedly been cut in half, reducing required visits to the platforms to only twice a year. The Vergnet GEV 5.5 wind turbines (pictured), with a diameter of 16.4 ft. (5 m) and a rated power of 5.5 kW, supply an 8,000 Ah battery bank with volts of electricity.

For more information on Vergnet
Circle 10 on Reader Service Card

Maritime Reporter/Engineering News

ECDIS With Radar Overlay Available From PinPoint

PinPoint Systems has launched PC ECDIS with radar overlay, an IMO/IHO compliant electronic chart display and information (ECDIS) system designed for commercial and military vessels. It is reportedly the world's first ECDIS system to simultaneously display raster and vector charts with real-time enhanced radar overlay on a PC platform.

The PC ECDIS system can be configured as software only, software installed on a compatible PC, or incorporated into a ruggedized deck console. It can be completely integrated with the vessels' bridge systems, interfacing with multiple navigation sensors. The exclusive R3000 radar overlay option takes the raw radar signal, processes it and displays an enhanced image over the raster or vector chart. The scan-to-scan conversion process reduces sea clutter while "blooming" smaller radar targets.

PC ECDIS reportedly complies with the IMO standard for ECDIS and supports the following data formats: Canadian Hydrographic Service (CHS), NOAA/BSB, NOS.BEO, ARCS (British Admiralty) raster charts, CMP-93 (Cmap's vector data) and the IHO SP-57 data format, formerly referred to as DX-90. Reportedly, the system is not limited geographically, as it reads both raster and vector data available from official hydrographic offices in addition to proprietary data.

The navigation system includes a voyage manager with built-in data log for recording voyage data, unlimited route creation, unlimited waypoint per route, route creation across multiple charts, a route monitoring system, and extensive route and waypoint editing facilities and chart updating. Other features offered by the system include ARPA radar input, marker symbols with text links, a view window, an automated deck log and the R3000 enhanced radar overlay. Other options available include ADS ship-to-ship transponder display, and an automatic search and rescue pattern generator.

For more information on PinPoint
Circle 17 on Reader Service Card

NSRP Announces Executive Control Board Meeting Results

The Executive Control Board (ECB) of the National Shipbuilding Research Program (NSRP) met on July 17-18 in Washington, D.C. The meeting, chaired jointly by **Murphy C. Mortimer** of **Boeing** and **Donald Spanninga** of National Steel Shipbuilding Co. (NASSCO), was the first meeting of the ECB. Mortimer is chairman and vice chairman,

respectively, addressed a number of issues oriented toward improving the international competitiveness of the U.S. shipbuilding industry. Among the topics addressed was the selection of projects for initiation in FY 97. A total of 20 projects were approved, subject to the availability of funding. Among these were:

- EPCRA Toxic Release Inventory

(TRI) Reporting Guide for the Shipbuilding Industry;

- Dynamics of Steel Requirements, Definition and Procurement Combined with Best U.S. Steel Industry Practices;
- Occupational Safety and Health Administration Technical Advisory Committee Phase II;
- Methodology of Part Standardization;
- Flux-Cored Welding with Low

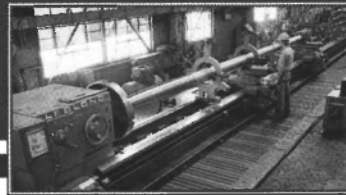
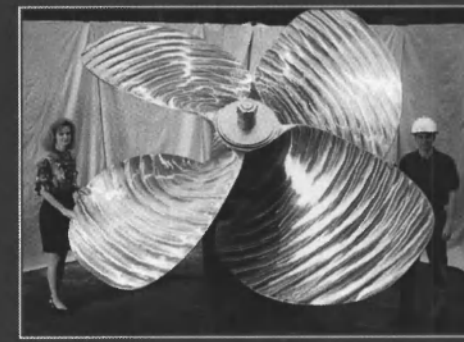
Spatter Using CO2; and
• Best Approach for Simulation Modeling Architecture in Shipyards.

In addition to the selection of projects for FY 97, the ECB addressed the concept for a so-called "super project" which could involve participation by several NSRP panels operating under the direct supervision of the ECB.

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Mobil Commissions Double Hull Supertanker

Mobil Corporation has commissioned its second double hull tanker, VLCC *Raven*. Naming ceremonies were held on May 31 at Sumitomo Heavy Industries, Ltd.'s Oppama shipyard in Japan. The 280,000-dwt tanker measures 1,089 x 190 ft. (317 x 58 m), and

will carry a cargo of 2.2 million barrels crude oil.

"The *Raven's* advanced design demonstrated Mobil's commitment to the safe operation of all our vessels and our concern for the protection of the marine environment," said **Gerhard Kurz**, president of Mobil Shipping and Transportation Company (MOSAT). "The ship incorporates the latest double hull technology and vessel naviga-

tion systems for an added margin of safety for the transportation of crude oil." The supertanker's design features exceed the stringent tanker safety standards set under OPA 90 and IMO rules. Mobil developed and patented the design for the first double-bottom tanker in 1968. The company reports that there are 10 ships in its fleet that have double bottoms.

The double hull is an evolution of

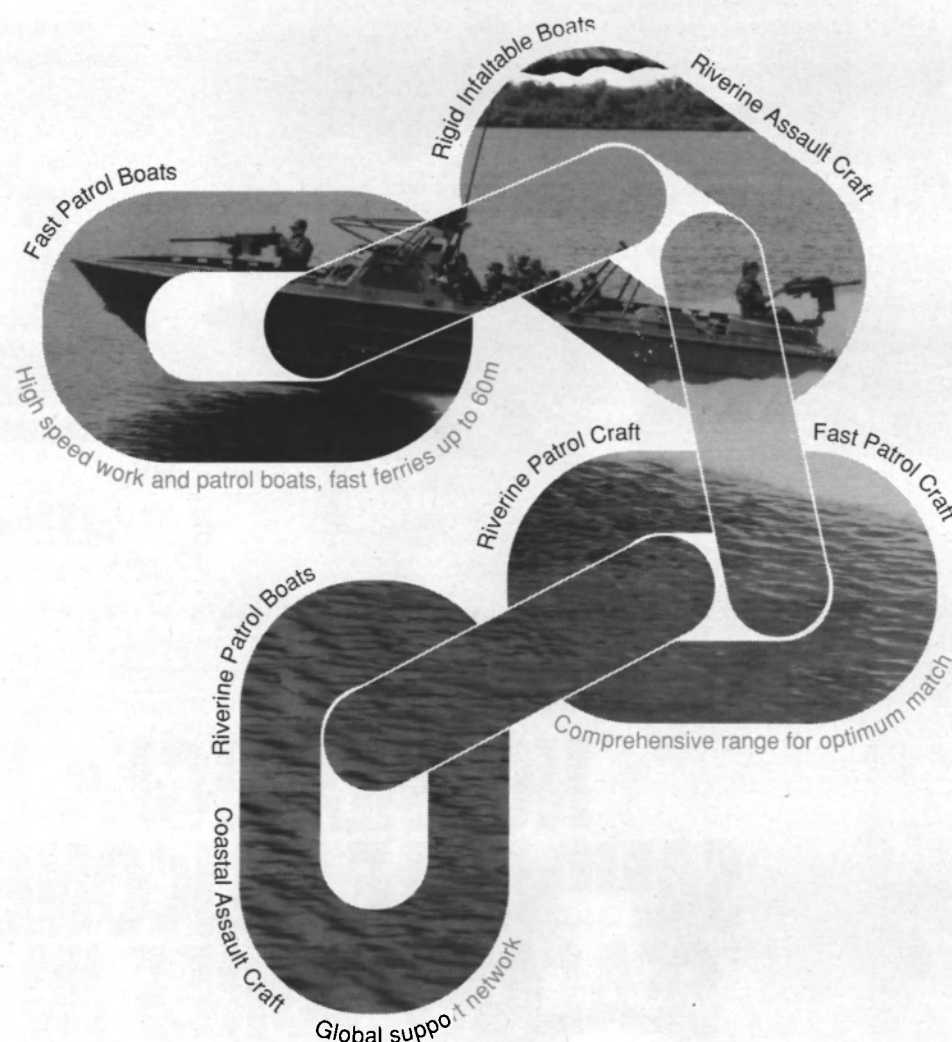
the double bottom design. It extends the double bottom up the sides of the vessel to provide a second steel barrier between the cargo and the marine environment. Since the crude oil is carried in the interior tanks, a breach of the outer hull would not result in the spillage of any oil.

The space between the inner and outer hulls of *Raven* is approximately 10 ft. (3.10 m) on the bottom and 13 ft. (3.9 m) on the sides. When the ship is fully loaded with crude oil, this space is empty. After the tanker has discharged its cargo, the protective space between the two hulls is filled with sea water as ballast for the return voyage. *Raven* will join MOSAT's fleet of 33 owned and controlled ocean-going tankers which, supplemented by chartered vessels, transport more than 700 million barrels of crude oil and petroleum products around the world each year.

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Circle 237 on Reader Service Card

Western Atlas International Orders Seatex Seapath 400

Seatex has sold a Seapath 400 system to Western Geophysical, a division of Western Atlas International. The Seapath 400 reportedly measures vessel attitude and heading accurate to .05 degrees. In addition, the system provides heave compensation of single-beam echosounders such as the Simrad EA500 installed on the Western Geophysical vessel. The benefits include optimum performance of swathe bathymetry and acoustic positioning systems, vessel position and velocity, as well as accurate heading data for gyro calibration and seismic survey. The Seapath 400 system will be installed onboard Western Geophysical's *Western Monarch*.

USCG Awards TSI Five-Year Contract

Turbine Specialties, Inc. (TSI) of Salina, Kan., has been awarded a five-year contract for a large bore turbocharger overhaul by the U.S. Coast Guard (USCG) Supply Center in Curtis Bay, Md. Under the contract, TSI will overhaul ALCO 131, 165 and 720 turbochargers for the main propulsion engines on USCG WMEC medium endurance cutters, and on WAGC *Polar Star* and *Polar Sea* icebreakers. Turbine Specialists, Inc. is an overhauler of large bore turbochargers and has another facility in Harvey, La. The company is owned by Elliott Turbomachinery Corporation and manufactures the Elliott and Delaval line of turbochargers and parts. TSI also overhauls Cooper, ElectroMotus Diesel, ALCO, MAN and ABB turbochargers. Quantic Engineering and Logistics Corporation of Panama City Beach, Fla., is the government sales representative for Turbine Specialists, Inc. and negotiated the contract on its behalf.

For more information

Circle 63 on Reader Service Card

Maritime Reporter/Engineering News-Record

**Meyer Werft Books
Livestock Carrier Conversion
For Kuwait**

Meyer Werft of Papenburg, Germany, has received an order for the conversion of a car carrier into a livestock carrier. The order was placed by the Kuwait Livestock Transport and Trading Co. (KLLT). It is the twenty-sixth livestock carrier conversion for the shipyard. Meyer Werft reportedly competed with Southeast Asian shipyards for the contract; there were reportedly no European shipyards among the contenders.

The conversion of *Al Messilah* will be carried out under the management of Meyer Werft in cooperation with a shipyard in Klaipeda/Lithuania and Motorenwerke Bremerhaven (MWB), Germany. The final outfitting work — installation of pens, fodder, drinking water and ventilation systems — will be completed in Papenburg. The total conversion period will be approximately 11 months. With a length of 610.2

ft. (186 m) and a breadth of 104.9 ft. (32 m), the ship will be capable of carrying 80,000 sheep or 75,000 sheep and 500 cattle.

For more information on Meyer Werft
Circle 65 on Reader Service Card

**Gardy McGrath Produces
Video Detailing
Environmental Systems On
21st Century Navy Ship**

Using state-of-the-art 3-D animation and digital technology, Gardy McGrath has completed a video production for the Chief of Naval Operations detailing the integration of the latest U.S. Navy environmental protection technology into the naval ship of the 21st century. Introducing the premise that a Navy ship is actually a "floating city" with numerous waste streams that are continually present, the tape depicts the challenges Navy engineers have had to face throughout the past 25 years of developing systems resulting in

clean wakes. From there, a 3-D animated "glass" hull of a 21st Century destroyer is utilized to show the system configurations for each shipboard waste stream, as well as the prototype equipment being deployed today in preparation for these designs.

The presentation has attracted the attention of the cable television show *SeaTek*, a marine technology series slated for airing on the Learning Channel in the fall. SeaTek producers are working with Gardy McGrath and the Navy to produce a segment that will address the Navy's environmental program technology as it relates to the "clean-wake" ships of tomorrow.

**Marine Electronics Solutions
Named Manufacturer's Rep
For Six Companies**

Marine Electronics Solutions Inc., based in Florida, has been named the manufacturer's representative in the Southeast and

Gulf Coast regions for the following companies: Transas Marine; Marisys; Mitel-Marine Adaptive Systems; Norselght/Kockum Sonics; Seiko Marine Clock Systems; and Sunair Communications.

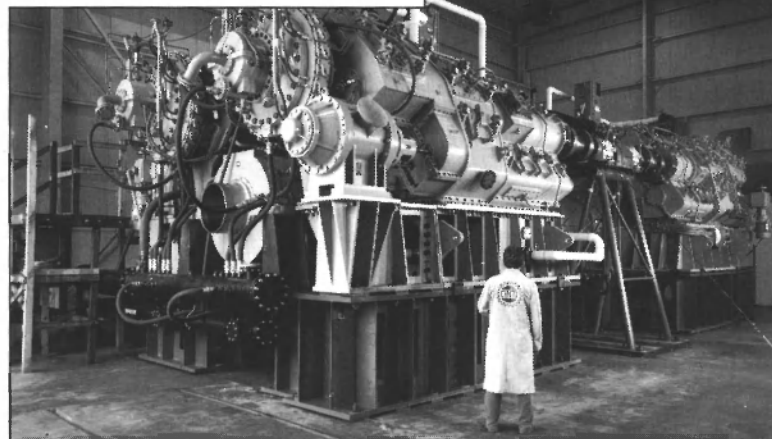
For more information on
Marine Electronics Solutions
Circle 104 on Reader Service Card

**Liberian Shipowners'
Council Opposes ITF "Week
of Action"**

Faced with stepped-up efforts by the International Transport Workers' Federation (ITF) to combat the rise of "flag of convenience" shipping, the largest association of owners and operators using Open Registry, the Liberian Shipowners' Association, has issued a statement.

"We are facing yet another attempt by the ITF to threaten open registry shipowners with boycott action," said **Jeremy M.S. Smith**, general secretary of the

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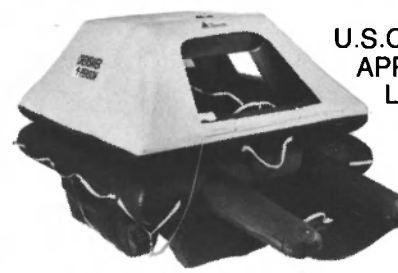
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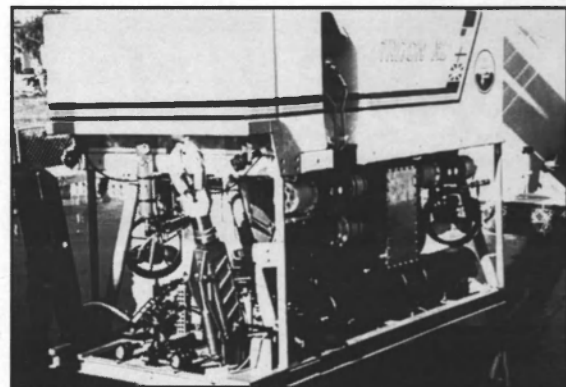
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FAX: 330/239-1352

is in the context of a confused number of accusations about the welfare of seafarers employed on open registry vessels."

A call for minimum international standards on labor relations for seafarers is certainly praiseworthy, but the ITF says it supports the many international conventions that maritime nations the world over — including open registries — have vigorously supported. "Responsible shipowners have long been concerned with maintaining high labor relations standards for seafarers, regardless of flag," said Mr. Smith. "The best thing we as an industry can do to improve working conditions for seafarers is to get substandard ships to comply. The ITF should turn its considerable power and attention to improving conditions onboard substandard ships and penalizing owners who do not comply with international labor standards."

The ITF affiliates national unions in all branches of transportation. In the case of open registries, the ITF enforces its policies by threatening a shipowner with boycott action if there is no agreement with the crew on conditions that are acceptable to the ITF.

Inbro Citygate Offers Offshore Standard Insurance Package For ROVs



London insurance broker Inbro Citygate is offering a standard cover reportedly suited to all types of submersibles from the simplest survey units to manned submersibles and pipelaying trenchers.

According to Inbro Citygate's Chairman **Gerry Graham**, the introduction of this cover has been made easier because the company has specialized in this sector for a number of years: "We now have several years of documented claims experience with ROVs working in various parts of the world including the North Sea, the Middle East, Southeast Asia, South Africa, Australasia and the U.S. Gulf. Our track record in this specialist field has enabled us to provide underwriters with detailed statistics which, in turn, has made possible the establishment of a placing facility tailored specifically to the needs of ROV operators."

The Inbro Citygate cover applies to all offshore equipment anywhere in the world, including while-in-use transit and storage for all risks of physical loss or damage.

The cover is placed 45 percent at Lloyd's with the remainder carried by major international insurance companies operating on the London Market.

For more information on Inbro Citygate
Circle 103 on Reader Service Card

Bisso Completes Salvage Operations On Offshore Tug Mac Tide 63

Bisso Marine Company, Inc. completed salvage operations on the 7,000-hp offshore tug *Mac Tide 63*. The tug sank in 60 ft. (18.2 m) of water, 30-mi. off the Louisiana coast in South Timbalier Block 96 after striking a submerged object. A 150-ft. (4.5-m) breach in the engine room was the cause of the sinking. The vessel, lying on her starboard side, became embedded 15-ft. into the natural bottom.

Underwater repairs were made using wet welding techniques and the vessel was pre-rigged for lifting. Diving services and a liftboat were provided by Subsea International of Belle Chasse, La. Bisso Marine's 700-ton derrick barge *Cappy Bisso* and 600-ton derrick barge *Lili Bisso* arrived on the scene, anchored into lifting position and brought the vessel to the surface in two hours.

Mac Tide 63 was towed into Fourchon, La., where the 80,000 gallons of diesel fuel that remained aboard the vessel during the salvage were discharge without incident. The floating vessel was then released to its owners, Tidewater Marine, Inc.

For more information on Bisso Marine
Circle 101 on Reader Service Card



Ingalls Commissions USS Cole

DDG 67, the eighth DDG 51 Class Aegis guided missile destroyer to be built for the U.S. Navy by Ingalls Shipbuilding, was commissioned *USS Cole*, and reported for duty during ceremonies on June 8 at Port Everglades, Fla. Commander **M. Stewart O'Bryan**, USN, will assume command of the new ship which will be homeported in Norfolk, Va.

For more information on Ingalls
Circle 99 on Reader Service Card

USS Cole sailed from Ingalls Shipbuilding in Pascagoula, Miss., on May 28, 1996. The ship is named to honor the life and service of Marine Sergeant **Darrell Samuel Cole**, who was posthumously awarded the Congressional Medal of Honor for his heroism during the Iwo Jima campaign in February 1945.



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Satellite Communications Review

SERVICE PROVIDERS

AMSC

In addition to standard satellite telephone service, American Mobile Satellite Corporation (AMSC) offers SKYCELL Satellite Dispatch Service — a satellite-delivered digital voice dispatch service. Customers can reportedly create multiple talk groups within any one of the SKYCELL Service ultra-wide area talk zones. The SKYCELL Service satellite coverage area includes virtually all of North and Central America and surrounding waters, from Alaska, down to the Panama Canal and throughout the Caribbean.

For more information on AMSC
Circle 38 on Reader Service Card

AT&T

AT&T Mobile Satellite Services delivers quality, reliable shore-to-ship, and now ship-to-shore Inmarsat services. With the addition of AT&T Inmarsat ship-to-shore, AT&T Mobile Satellite Services offers a full range of maritime services. AT&T Inmarsat A, B, and M ship-to-shore and shore-to-ship, along with AT&T High Seas Direct, will reportedly provide a clear, cost-effective connection anywhere on land or at sea.

For more information on AT&T
Circle 13 on Reader Service Card

British Telecom

BT Inmarsat provides satellite communications coverage for the

Atlantic Ocean Region. BT has joined forces with Norway's Telenor and Singapore Telecom, creating an alliance which offers direct dial telephone, fax and data services to more than 200 countries worldwide. BT SatMail is a new managed mailbox service which gives ships access to the Internet and X.400 networks for e-mail messaging and other information services. Other BT Inmarsat Services include: BT Inmarsat A; BT Inmarsat A High Speed Data; BT B-Sat; BT M-Sat; and BT C-SAT.

For more information on BT Inmarsat
Circle 32 on Reader Service Card

IDB Mobile Communications

IDB Mobile Communications is a global provider of Inmarsat A, B and C voice, fax, data and telex services. IDB offers global Inmarsat A, B, M and S voice, telex, fax and data services. IDB has introduced Oceancall North American telephones services which promise to serve maritime users with up to 80 percent of satcom communications.

For more information on IDB
Circle 31 on Reader Service Card

Inmarsat

Inmarsat-3 F1, the first of Inmarsat's new generation of commercial mobile communications satellites, entered service on May 11. The satellite will serve the Indian Ocean Region at 64 degrees east longitude. It is reportedly eight times more powerful than its

predecessor, the Inmarsat F2 Indian Ocean Region satellite, which now becomes a spare for that region. Inmarsat's third generation, to eventually comprise five satellites by the third quarter of 1997, will reportedly expand the availability and usefulness of global mobile satellite communications by making possible lower cost communications services operating with even smaller, more economical mobile and transportable terminals.

For more information on Inmarsat
Circle 27 on Reader Service Card

KDD

KDD will complete its global coverage of total Inmarsat services by the end of 1996, when its Inmarsat A and C services are scheduled to be available in all four ocean regions. Customers will reportedly be able to access KDD's land earth station anywhere on the world's oceans by entering ID number "03" for Inmarsat-A service. KDD's Inmarsat B and M services can already be used in any ocean region via ID number "003." Currently, KDD provides Inmarsat A service for three ocean regions (POR, IOR and AOR-W), and Inmarsat C service for two ocean regions (POR and IOR).

For more information on KDD
Circle 37 on Reader Service Card

Maritime Cellular Network

Maritime Cellular Tele-Network Inc. (MCN), a subsidiary of ICG Satellite Services, provides digital

phone, fax and data transmissions using satellite communications for commercial and private vessels in North and Central America, the Caribbean, Alaska and Hawaii. The mobile satellite system reportedly provides customers with remote communications from more than 600 miles away.

For more information
Circle 25 on Reader Service Card

ORBCOMM

ORBCOMM is reportedly the world's first low-earth orbit satellite communications service. The company offers a data communications and digital messaging service to the maritime industry using small, low-cost, powerfugal communications with omni-directional antennas.

For more information on ORBCOMM
Circle 30 on Reader Service Card

PTT Telecom

Station 12 is the global marine satellite communications provider of PTT Telecom Netherlands. Its portfolio consists of Inmarsat A, B, C, D and M services, as well as radio services of Scheveningen Radio. Via land earth stations in Barum, the Netherlands, and Yamaguchi, Japan, Station 12 offers its Inmarsat services worldwide. Early in 1997, Station 12 will introduce the world's first Inmarsat D+ service. This technology is reportedly suitable for global two-way services for short messages, tracking and tracing, and monitoring and control.

For more information on PTT Telecom
Circle 28 on Reader Service Card

Saudi Telecom International

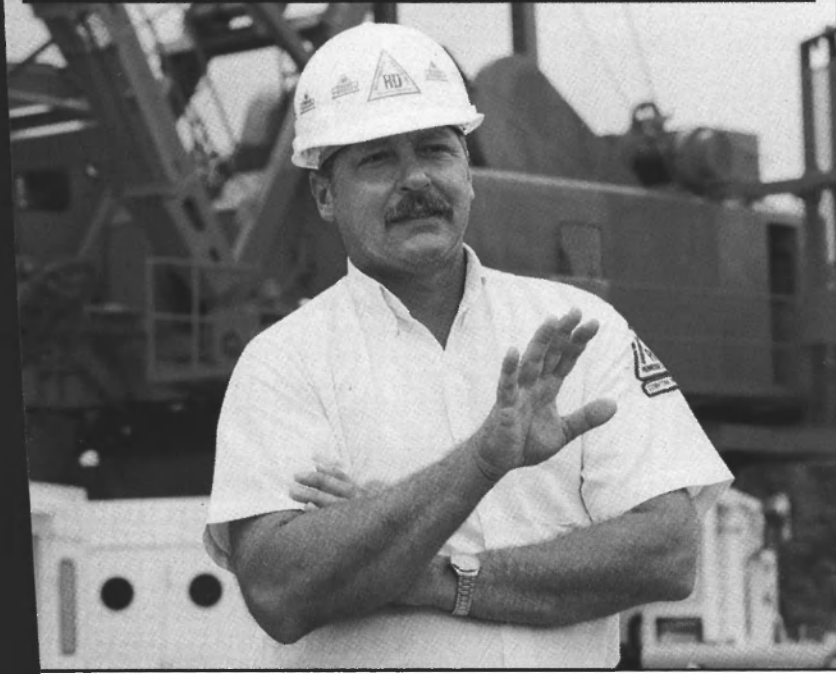
Under Telephone Expansion Project-6 (TEP 6), Saudi Arabia has awarded NERA (a subcontractor of AT&T) the upgrading of the existing Inmarsat land earth station, operating in IOR, and implementation of a new Inmarsat land earth station in AOR-E region for the introduction of Inmarsat Standard A, B, C, M and Mini-M services in the fourth quarter of 1996.

For more information
Circle 34 on Reader Service Card

Singapore Telecom

Singapore Sentosa Land Earth Station provides the full range of Inmarsat A, B, C and M services in the Pacific Ocean Region (POR) and Indian Ocean Region (IOR). New services available include Sentosa Mail-65, a global electronic mail system for both ship-to-shore and shore-to-ship communications. Sentosa Mail-65 users are able to send and receive files and messages via Internet mail, X.400 mail and telex. The Intouch card is a prepaid calling card service which can reportedly be used to

JOHN DEERE ENGINES ARE COMIN' ON STRONG



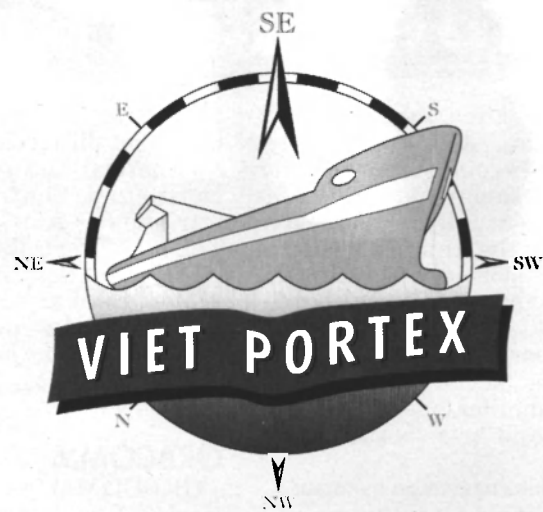
IN CRANE BARGES.

"Very little maintenance." Joel Smith, of R&D Maintenance Service operates a new 54' x 160' crane barge with two Deere gen-set engines. He also uses two Deere powered compressors elsewhere in the project. "To my knowledge we haven't had to do anything but routine service on any of them."

"Seven years old and the engines run with no problems." Smith likes the way even older Deere engines keep delivering the performance he needs. "The compressor engines have been in service for 7 years now, and they still work like the new ones. They just keep running. They give us the dependability we need on projects like ours."



John Deere engines from 70-300 hp (52-224 kW) are being used on more workboats of all kinds every day. Talk to the people who use them and find out why.



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Circle 234 on Reader Service Card

SatCom Review

call via any Inmarsat A,B,M telephone to any destination worldwide via Sentosa LES.

For more information

Circle 26 on Reader Service Card

Seven Seas

Seven Seas Communications provides satellite communications services to maritime and land users. Seven Seas is a leading Inmarsat service provider to the worldwide commercial fishing and yacht markets and has a strong presence in the land mobile and other maritime markets as well. The company currently provides a full array of Inmarsat services including Inmarsat A, M and B services through its partnership with IDB Mobile Communications, owners and operators of coast earth stations.

For more information on Seven Seas
Circle 144 Reader Service Card

Telecom Italia

Telecom Italia is controlled by STET, which is IRI's telecommunications holding company. The Italian Ministry of Port and Telecommunications for handling maritime communications, including installation, operation

and maintenance of radiotelephonic and radiotelegraphic radio stations onboard, is a division of Telecom Italia. The company operates the services connected with the traffic of telephone, telegraph and satellite radio communications, and acts as the "traffic accounting authority," officially recognized by international organizations and institutions.

For more information

Circle 35 on Reader Service Card

Tele Danmark Erhverve

Tele Danmark Erhverve — the Danish Inmarsat Signatory — operates the Blaavand Inmarsat-C LES, covering Atlantic Ocean Region East (AOR-E). Blaavand LES is part of a joint effort by the Nordic countries and the U.K. to provide global coverage to Inmarsat-C users.

For more information

Circle 36 on Reader Service Card

Teleglobe

Teleglobe has decided to regroup its Inmarsat activities and has reached an agreement in principle with NewEast Wireless Technologies Inc. for the formation of a new company. The new entity will be solely dedicated to the provision of mobile satellite communications, and will initially offer all of Teleglobe's and NewEast's Inmarsat global satellite services.

For more information on Teleglobe

Circle 33 on Reader Service Card

COMSAT Offers Cruise Lines Communications Concession

COMSAT Mobile Investments has announced a program under which cruise lines can reportedly expand their telecommunications facilities while turning the radio room into a profit center. Communications Concession is a turnkey program in which COMSAT creates and administers a total maritime telecommunications service package for the cruise ship. It includes hiring personnel, purchasing new equipment, passenger call accounting, providing satellite services for ship's business and all other aspects of radio room operations.

Together, the cruise line and COMSAT will evaluate the current communications equipment on the ship to decide what combination of technologies best fits the ship's requirements while maximizing revenues and business efficiency. COMSAT provides the additional capital required for the new equipment, and is also responsible for maintenance and repairs. The cruise line does not have to make capital investment for new equipment.

Initial trials of the Communications Concession took place on several Cunard ships, according to Kathryn Y. Holman, COMSAT Mobile Communications vice president of Sales. It was first instituted on *Sea Goddess I* in October 1994, and shortly after, *Royal Viking Sun*, *Vistafjord*, *Sagafoord* and *Sea Goddess II* added the program to their portfolios. "These programs have been very successful, prompting us to expand the program to other cruise lines," said Ms. Holman.

COMSAT Mobile Communications, a business unit of COMSAT Corporation, provides global satellite communications services to maritime, aeronautical and land mobile customers, and international business travelers via the Inmarsat satellite network. COMSAT Corporation is a global provider of communications and entertainment products and services.

For more information on COMSAT
Circle 74 on Reader Service Card

Telstra

Telstra Mobile Satellite & Radio Services has introduced standard data and high speed data capabilities to its Satcom B service as part of its ongoing commitment to provide vessels with the latest in mobile satellite technology. Telstra Satcom B uses the Inmarsat network of satellites to provide customers with coverage in the Atlantic, Indian and Pacific Ocean Regions using a single access code. Multi-channel functionality is reportedly also available with selected Telstra Satcom B terminals. Satcom service will not be available until September.

For more information on Telstra

Circle 29 on Reader Service Card

EQUIPMENT SUPPLIERS

BIMCOM

BIMCOM's founding organization is BIMCO (The Baltic International Maritime Council)

Maritime Reporter/Engineering News-Record

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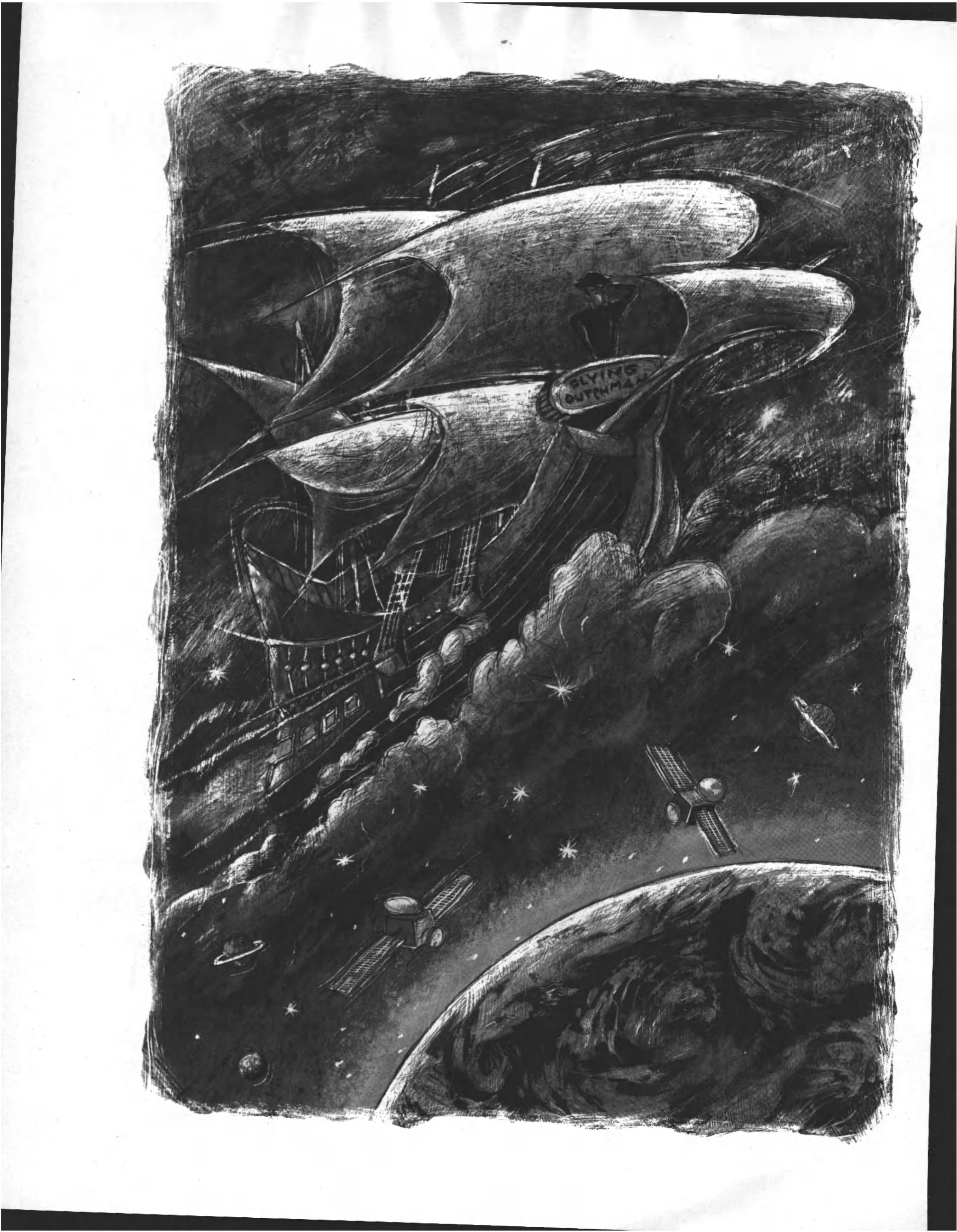
Mackay Communications is proud to announce the addition of satellite air-time to our formidable list of services, making us the first full-service marine provider. The dependable quality you've come to expect from Mackay for over 100 successful years, can now be found when making Inmarsat A,B,M,C and AMSC calls.

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Satellite Communications Review

— which represents more than 60 percent of the world's gross tonnage. BIMCOM, with Mercury Communications Ltd., provides telecommunications and messaging services to the maritime industry. In 1993, Cable & Wireless (C&W), Mercury's parent company, became a shareholder, giving BIMCOM the opportunity to increase coverage and add other C&W telecommunications products. BIMCOM offers international messaging (telex, fax, e-mail, EDI and X.400); Virtual Private Networks (VPNs); gateways to information services and databases; consultancy on a range of communications and business issues; and training in information technology.

For more information on BIMCOM
Circle 43 on Reader Service Card

Birgers Marinteknik

Birgers Marinteknik, Stockholm, Sweden, has developed a cost-effective antenna stabilization platform, MAP-3, based on an advanced mono-pulse tracking technique and real-time processing. MAP-3 works with antennas up to 13 ft. (4 m) in diameter and in C, X, and Ku-band (4-17 GHz) frequencies.

For more information on Birgers Marinteknik
Circle 73 on Reader Service Card

BOATRACS

BOATRACS, Inc. is the U.S. marine market distributor of the OmniTRACS System, a satellite-based communications and tracking system manufactured by QUALCOMM Inc. The system provides two-way communications between vessels at sea and base stations on land, or with other vessels. It also allows for real-time tracking and monitoring.

For more information on BOATRACS
Circle 50 on Reader Service Card

Commercial Satellite Systems Inc.

Commercial Satellite Systems Inc. (CSSI) is the North American distributor for STN Atlas Elektronik's product line of Inmarsat M Terminals. These products include the

SP1600B Briefcase Terminal, SP1600M Maritime Terminal and SP1600T Fixed Terminal. The Atlas terminals are provided with voice, facsimile and data transmission capability as standard features. Atlas has obtained Inmarsat type approval for the data service. CSSI is also a provider of integrated C-Band and Ku-Band trailer-mounted, transportable and maritime systems. A recent product introduction is the CSS200 Transportable C/Ku-Band communications system.

For more information on CSSI
Circle 42 on Reader Service Card

CP Communications, Inc.

CP Communications Inc. (CPCI) — a division of CruisePhone, Inc., a provider of in-cabin cruise ship communications services — is a full-service mobile satellite communications company for commercial and recreational maritime markets, offering complete turnkey solutions from cellular and Inmarsat to C-Band and American Mobile Satellite Company (AMSC) MSAT service.

For more information on CP Communications
Circle 44 on Reader Service Card

Furuno

Furuno's new Felcom 80 Satcom B system was developed for commercial and larger private vessels, meeting stringent Class I requirements of GMDSS, as well as the Class II requirements for minimum phone and fax services at sea. The Felcom 80's innovative antenna rotates a full 360 degrees — eliminating the need for "antenna rewind." This provides uninterrupted satellite links for disruption-free voice, fax, telex and data communications at sea.

For more information on Furuno
Circle 46 on Reader Service Card

IN-SNEC

IN-SNEC is a designer and supplier of Inmarsat Satellite communications terminals for both land and sea applications. Both M and C terminals are available. The Cmate unit is suitable for GMDSS applica-

tions. IN-SNEC specializes in satellite-related activities including tracking and telecommunications systems.

For more information on IN-SNEC
Circle 47 on Reader Service Card

Magnavox

Magnavox MX3030 and MX3400 Inmarsat M termi-

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Fax: (01) 792-0649
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Globe Communications Limited Dhaka
Phone: (02) 231045/81563 Fax: (02) 888627
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2000 Antwerp Phone: (03) 541 04 63
Fax: (03) 542 61 23/64 27 38
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Marine Communications
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- BRAZIL**
O.L. Naval Ltda. Rio de Janeiro - RJ
Phone: (021) 222 5687/292 4148, line 271
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Rousse Radio - Rousse 7000 Bulgaria
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Radio-Holland Group - Hong Kong
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Generale S.r.l. (pleasure/fishing)
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Radio-Holland - Port of Mafraq
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Phone: 2462347/8 Fax: 2458070
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- MEXICO**
Nautica S.A. de C.V. - 01010 Mexico D.F.
Phone: (05) 651 9740 Fax: (05) 651 2825
- MOROCCO**
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Phone: 2-307688 Fax: 2-305383
- MURMANSK**
Murmansk Ltd.
20 Gennadiyev Str. - 153002 Murmansk
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- NEW ZEALAND**
Electronic Navigation Ltd. - Auckland
Phone: (09) 3764051 Fax: (09) 3780184
- NIGERIA**
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International Aeradio Pakistan (Pvt.) Ltd.
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- PERU**
Isidrik - Lima 14
Phone: 51 1 471 2889 Fax: 51 1 472 2252
- POLAND**
EPA Ltd. - 71-324 Szczecin
Phone: (48) 91 874885 Fax: (48) 91 875014
- PORTUGAL**
Nautic - Electronica Maritima, Lda. - 1300 Lisbon
Phone: (01) 2870656/7 Fax: (01) 3073004
- QATAR**
Satcom Technical Services Co. - Doha
Phone: 44120441413 Fax: 329292
- ROMANIA**
SC Inmat Maritime SA Constanta - Constanta 6700
Phone: (40) 41 639038 Fax: (40) 41 674356
- RUSSIA**
Tatara Marine Overseas Ltd.
St. Petersburg - 153019 Russia
Phone: 012-502 2000 Fax: 012-567 1901
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Key Communications Development Ltd. (KCD)
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- SENEGAL**
Optim Senegal - Dakar
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- SINGAPORE**
Radio-Holland BV - Singapore 639000
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Radio-Holland Group - Pardeners Estate 7465
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Electronautica Uruguaya Ltda. - Montevideo
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- USA**
Radio-Holland USA, B.V. - Houston - Texas
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- VENEZUELA**
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BOATRACS And ORBCOMM To Join Teams

BOATRACS, Inc., has signed an agreement with ORBCOMM USA to use ORBCOMM's global, two-way satellite data and messaging system for position tracking and data messaging on inland river barges and other vessels in U.S. waters.

"Combining ORBCOMM's satellite technology with BOATRACS's software and proprietary messaging service will allow our customers a cost-effective means to monitor and track their barge vessels when detached from the workboat," said Michael Silverman, president and CEO of BOATRACS. "We will also offer software solutions to our customers integrating ORBCOMM and our existing QUALCOMM OmniTRACS System, which will expand our existing satellite coverage significantly."

BOATRACS, headquartered in San Diego, is the distributor in the U.S. marine market of the OmniTRACS System, a satellite-based communications and vessel tracking system developed and manufactured by QUALCOMM Inc. The system provides two-way communications between vessels at sea and base stations on land, or with other vessels. It also allows for real-time tracking and monitoring. BOATRACS currently has systems on vessels operating on both U.S. coasts, the Gulf of Mexico, Mexico, Canada and Europe. In addition, BOATRACS has Letters of Understanding with QUALCOMM distributors in Mexico and Europe. BOATRACS has appointed Roy Lund, vice president of Sales, as project manager for the BOATRACS/ORBCOMM effort. ORBCOMM is a partnership owned by ORBITAL Sciences Corp. and Teleglobe Inc. of Canada. Orbital Sciences is a space technology company that designs, manufactures and markets a broad range of space products and satellite-based services. Teleglobe, a Canadian-based company specializing in the field of telecommunications, operates a network of cables and satellites linking Canada with more than 230 countries and territories.

For more information on BOATRACS
Circle 106 on Reader Service Card

For more information on ORBCOMM
Circle 107 on Reader Service Card

Satellite Communications Review

nal owners can now send and receive data, due to a new 2.4 kbps data option being offered by the company. The terminals offer a full range of voice, fax and data devices provided by Inmarsat M. Maganavox's data option is type

approved by Inmarsat for the MX3400 marine terminal and the MX303 portable briefcase satellite. It reportedly provides real-time digital data transfer throughout the Inmarsat M satellite system, anywhere in the world.

The MX3400 MAGNAPhone M is a marine satellite terminal designed for use on boats as small as 40 ft. (10 m). It included a compact, stabilized antenna unit enclosed in a waterproof radome. The MX3030 MAGANAPhone M is

a briefcase satellite telephone that includes an internal power supply and replaceable battery pack.
For more information on Maganavox
Circle 49 on Reader Service Card



SAILOR SAT-B
SP4400

Close at hand...

A long-standing tradition of high quality products is being maintained in a completely new satellite-based communication programme. Considerable developments lies behind the creation of the new SAILOR SAT-B and SAT-M equipment which includes a large number of improvements compared with the equipment previously available on the market. The SAILOR SAT-B and SAT-M are supplied in different versions to meet the communication requirements of users as well as the statutory requirements concerning voice, fax, data and HSD (High Speed Data).



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Circle 276 on Reader Service Card

July, 1996

OGM Communications

OGM Communications was created to provide solutions for the growing satellite communications market. OGM offers a wide range of mobile satellite communications hardware, including Inmarsat and terrestrial communications equipment, as well as complete licensing, commissioning and billing services. Inmarsat M, B and A services are provided with worldwide coverage.

For more information on OGM
Circle 39 on Reader Service Card

OSN

O'Gara Satellite Networks (OSN) reportedly introduced the world's smallest/lightest Inmarsat M terminal. The Compact-M weighs 5.5 lbs. and measures 11.3 x 6.8 x 2.8 ft. (3.4 x 2.1 x .8 m).

For more information on OSN
Circle 40 on Reader Service Card

Philips Navigation AS

Philips offers marine and land-based satellite communications systems. The Safecom CMX and CM2 use Inmarsat C satellites and comply fully with GMDSS requirements. The Safecom CL2 is a land mobile Inmarsat C transceiver. The briefcase-sized Safecom MP uses Inmarsat M for voice, data and fax. The antenna can be sited 328 ft. (100 m) from the telephone unit, and optional built-in battery provides 40 minutes talk-time or six hours' standby when mainpower is unavailable. Philips has a full range of Inmarsat-approved accessories including message terminal, data monitor, printer, remote alarm unit and power supply with automatic change over from AC mains to 24-V battery in case of power failure.

For more information on Philips
Circle 41 on Reader Service Card

Scientific-Atlanta

Scientific-Atlanta's Inmarsat M systems provide global, two-way voice, fax and data satellite communications for vessels 35 ft. (10.6 m) or longer. The single-channel MariStar-M offers an active, stabilized antenna pedestal which reportedly provides increased call reliability, lower power consumption and absence of "cable unwrap." The MariStar Multi-M can support up to 16 simultaneous voice/fax channels. To accommodate higher data rates and large volume fax requirements, this system can be integrated with an Inmarsat B.

77

MariStar-M and MariStar Multi-M features include multiple language voice prompts, access control and credit card capability.

For more information
Circle 24 on Reader Service Card

SKANTI AS

SKANTI AS has introduced the Inmarsat M Scansat-M, consisting of an antenna unit, an electronic transceiver unit and a user-friend-

ly, mobile, radio-like handset. The rotary joint allows the antenna to turn freely without interruptions from cable-unwrap.

The three-axis principle used in antenna construction reportedly secures a reliable and constant tracking of the satellite under all conditions, independent of vessel rolling and pitching of the vessel. Scansat-M uses two independent receivers; one takes care of the actual communications, the other

is used exclusively to keep track of the satellite.

For more information on Skanti-AS
Circle 48 on Reader Service Card

Trimble

Trimble is a leader in GPS satellite-based navigation, positioning and communications data products. The company holds patents on many GPS technologies, and these products are sold worldwide

for diverse applications, including land and hydrographic survey; GIS data acquisition; military, general, corporate and commercial aviation; marine navigation; vehicle tracking and communications; and mobile GPS.

For more information on Trimble
Circle 45 on Reader Service Card

Watercom Appointed Dealer

For KVH

KVH Industries, Inc. has appointed Watercom as a dealer for its new TracVision stabilized antenna system. TracVision is an actively stabilized antenna system which keeps a 24-in. diameter carbon fiber satellite antenna precisely pointed at new high-powered satellites. As the boat turns, pitches and rolls, TracVision moves the satellite antenna in exactly the opposite direction, maintaining the tracking accuracy needed to assure uninterrupted satellite television reception on a boat.

For more information on Watercom
Circle 51 on Reader Service Card

Globe Wireless Announces

Indian Ocean Node

Globe Wireless has announced an agreement with Telstra Corporation Ltd. to establish an HF radio node on the Australian continent. The coastal station, Perth Radio, will enhance the coverage of the Global Radio Network in the Indian Ocean and Far East.

"Perth Radio will improve our coverage of the Indian Ocean area," said Dino Martins, general manager of Globe Wireless. "In combination with our other new node, Bahrain Radio, vessels in that part of the world will have complete, 24-hour access to the Global Radio Network."

The radio service will be provided and operated by Telstra under an arrangement with Globe Wireless. Telstra will also cooperate with Globe Wireless to market the GlobeEmail service introduced in Australia.

For more information on Globe Wireless
Circle 52 on Reader Service Card

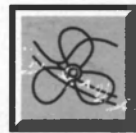
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FAST SHIP uses NURBS surfaces to assure fairness and flexibility when designing any hull, appendage or superstructure. Featuring real time lines update while editing, hydrostatics and export to IMSA & CAD programs, FAST SHIP is used from concept to final fairing by the US Navy and leading ship designers and builders.

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NavCad

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NavCad offers an integrated platform to predict resistance and power, and to determine optimum propeller parameters. With NavCad each aspect of a ship's performance can be evaluated for virtually every type of displacement hull, semi-displacement hull, river barge train, catamaran and auxiliary-powered sailboat.



General HydroStatics (GHS)

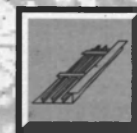
from Creative Systems, Inc.
Widely recognized as the most advanced and productive trim/stability/strength software. Specialized versions are available for ship operators, for salvage engineers and for small craft designers. Includes efficient modeling for all types of complex vessels, and the ability to analyze them both afloat and aground.



ShipCAM & NC-Pyros

from Albacore Research Ltd.
ShipCAM: Fairing, lofting, surface/surface intersection, filleting between two surfaces and shell expansion for developable and compound curvature surfaces for ship construction and repair.

NC-Pyros is a NC-code generator for burning featuring automatic path connection, leads and interference check.



Maestro

from Proteus Engineering
MAESTRO is a structural design tool which combines finite element analysis, failure mode evaluation and multiobjective structural optimization. Rapid modeling of structure and of realistic ship loads enable full ship structural analysis to be an integral aspect of the design process for ships, advanced and high performance vehicles, offshore structures and submarines.

IMSA

A cooperative association of software developers with complementary marine design products.
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Circle 243 on Reader Service Card

MARITEX

Discover the World of MARITEX

Use MARITEX to exploit the commercial benefits of the GMDSS MF/HF equipment investment on board your ships.

The dynamically linked coast stations of MARITEX form a computer controlled world-spanning MF/HF network for maritime text communication - with outstanding qualities. The new generation of MF/HF radio stations for GMDSS are, in most cases, ready to be used for commercial traffic in MARITEX. Non-GMDSS ships, too, very often carry the equipment required for MARITEX. Check with us.

No entrance or subscription fees.

MARITEX offers the following features:

- Shore-to-ship messaging via telex or dial-up modem - with single point access and optional Delivery Confirmation.
- Two-way messaging via BIMCOM Electronic Mail.
- Automatic, unattended delivery on board.
- A variety of ship-to-shore services via telex or text-telefax.
- Outstanding communication economy through highly competitive traffic rates.
- 24 hour communication in all Ocean Areas.
- 24 hour customer support and a help-desk.

Welcome to MARITEX!

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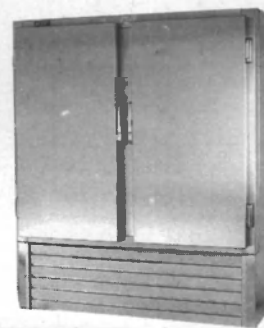
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SEA Introduces New Inmarsat C Satellite Communications System

SEA Inc. now offers the SEASAT 2 Inmarsat C satellite communications system. The SEASAT 2 reportedly provides private and secure communications links, with access to public data networks and bulletin services from virtually any point on the globe. SEASAT 2 communicates through the Inmarsat C satellite data network, which consists of four geosynchronous satellites along with numerous coast earth stations (CES) worldwide. Inmarsat's SafetyNET service broadcasts weather conditions, safety bulletins and navigational warnings. SEASAT 2 can automatically receive and print notices relevant to your specific region of operation. SEASAT 2 is available with an optional built-in GPS receiver that can replay vessel position, speed and course.

For more information on SEA Inc.
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Principal Contracts Recorded, May 1996

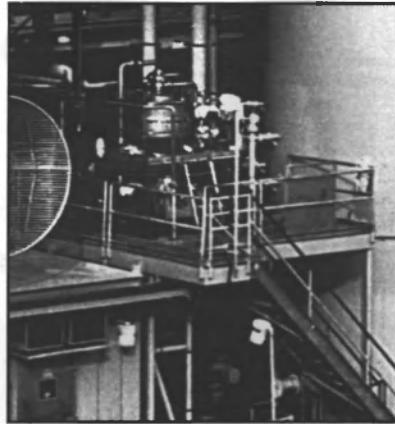
Orders are listed alphabetically, by vessel type. Publisher is not responsible for errors or omissions. For additional information on this, or other ship market information, contact: FERLISHIP, Paseo De San Francisco De Sales, 8, 28003 Madrid, Spain, tel: +341 441 4138; fax: +341 441 4138.

Owner/ Operator	Country (Owner)	Shipyard	Country (Shipyard)	Ship Type	No.	Delivery Date	Price \$M
CANADIAN STEAMSHIP	CANADA	JIANGNAN	CHINA	BULK CARRIER	1	1998	43
COSCO	CHINA	DALIAN SHIPYARD	CHINA	BULK CARRIER	1	1998	40
COSCO	CHINA	JIANGNAN	CHINA	BULK CARRIER	2	1998	59
IMC	SINGAPORE	DALIAN SHIPYARD	CHINA	BULK CARRIER	2	1998	36
P. LAIESZ	GERMANY	PT PAL	INDONESIA	BULK CARRIER	1	—	28
NISSHO/SAMONAS	—	NIPPON KKK	JAPAN	BULK CARRIER	2	1997	51.4
H. CORP.	—	SHIN KURUSHIMA	JAPAN	BULK CARRIER	3	1997	57.2
MITSUI O.S.K. LINES	JAPAN	IMABARI SHIPBUILDING	JAPAN	BULK CARRIER	3	1997	58.5
NISSEN KAIUN KKK	JAPAN	MITSUI ENG.&SHIPBUILDING	JAPAN	BULK CARRIER	1	3/98	23
MITSUBISHI AND NISSHIN	JAPAN	SUMIMOTO	JAPAN	BULK CARRIER	2	1997	52.4
MITSUBISHI CORPORATION	JAPAN	HAKODATE DOCK	JAPAN	BULK CARRIER	2	97/98	—
MISC	MALAYSIA	SASEBO	JAPAN	BULK CARRIER	4	97/98	110
TOPLINK	U.S.	NIPPON KKK	JAPAN	BULK CARRIER	2	1998	51.4
HYUNDAI MM	KOREA	HALLA	KOREA	BULK CARRIER	1	10/97	25
FERROSTAAL	—	TURKISH SHIPBUILDING	TURKEY	BULK CARRIER	3	1998	—
U.S. COAST GUARD	U.S.	MARINETTE MARINE CORP.	U.S.	BLOU TENDER	2	1999	50
COLUMBIA SHIPMANAGEMENT	—	ADMIRALTEISKIY	RUSSIA	CARRIER	3	96/97	—
SOVCOMFLOT	RUSSIA	SPLIT	—	CHEMICAL	3	1997	99
SOVCOMFLOT	RUSSIA	TROGIR	CROATIA	CHEMICAL	2	1997	66
SOVCOMFLOT	RUSSIA	ULJANIK	CROATIA	CHEMICAL	3	1997	99
FINAVAL	ITALY	NORDSOVAERFJET	DENMARK	CHEMICAL	1	1997	17
MARNAVI	ITALY	NORDSOVAERFJET	DENMARK	CHEMICAL	1	1997	17
JO TANKERS	NORWAY	KVAERNER GOVAN	U.K.	CHEMICAL CARRIER	1	1998	76
ERNST KOMROWSKI	GERMANY	QING SHAN SHIPYARD	—	CONTAINER	2	1998	—
COLUMBIA SHIPMGMT	GERMANY	WEIHEI	CHINA	CONTAINER	4	97/98	—
ERNST KOMROWSKI	GERMANY	WENZHO	CHINA	CONTAINER	2	—	—
CP OFFEN	—	FLENDER WERFT	GERMANY	CONTAINER	2	98/99	93.4
PETER DOHLE SCHIFFAHRTS	GERMANY	KVAERNER WARNOW	GERMANY	CONTAINER	4	97/98	183
PETER DOHLE SCHIFFAHRTS	GERMANY	KVAERNER WARNOW	GERMANY	CONTAINER	4	97/98	—
PETER DOHLE SCHIFFAHRTS	GERMANY	KVAERNER WARNOW	GERMANY	CONTAINER	4	1998	184
DJAKARTA LLOYD	—	PT PAL	INDONESIA	CONTAINER	1	1998	28
NAN TAI LINE	—	KYOKUYO ZOSEN	JAPAN	CONTAINER	2	1997	36
NEPTUNE SHIPMANAGEMENT	—	MITSUBISHI H.I.	JAPAN	CONTAINER	2	1997	—
N.Y.K.	JAPAN	SHIN KURUSHIMA	JAPAN	CONTAINER	1	1997	—
P&O CONTAINERS	U.K.	ISHIKAWAJIMA HARIMA H.I.	JAPAN	CONTAINER	2	1998	—
P&O CONTAINERS	U.K.	I.H.I.	JAPAN	CONTAINER	2	1998	—
HANSA TREUHAND	GERMANY	HANJIN	KOREA	CONTAINER	2	97/98	—
GEBAB	—	DAEWOO	KOREA	CONTAINER	1	97/98	56
GEBAB	—	DAEWOO	KOREA	CONTAINER	2	97/98	92
FREDRICH DETJEN	—	HALLA	KOREA	CONTAINER	5	3/98	173.8
CONTI REEDEREI/CROWLEY	GERMANY	DAEWOO	KOREA	CONTAINER	3	1998	93
ARMAMA SHPG & TRADING	—	WELGELEGEN	NETHERLANDS	CONTAINER	2	1997	—
BERNARD SCHULTE	—	SZCZECIN SHIPYARD	POLAND	CONTAINER	1	10/98	29
CSAV	CHILE	SZCZECIN SHIPYARD	POLAND	CONTAINER	4	8/98	120
UNKNOWN	GERMANY	GDYNIA	POLAND	CONTAINER	10	98/99	400
UNILINE-NAV UNIVERSAL	PERU	SZCZECIN SHIPYARD	POLAND	CONTAINER	2	8/98	50
NAVIERA DEL ODIEL	SPAIN	BARRERAS	SPAIN	CONTAINER	2	97/98	—
CHENG LIE NAVIGATION	—	CHINA SHIPB. CORP.	TAIWAN	CONTAINER	2	97/98	60
CLIPPER DENMARK APS	DENMARK	YARDIMCI	TURKEY	CONTAINER	2	1997	22
AMOCO	—	SONAT OFFSHORE DRILLING	U.S.	DRILLSHIP	1	—	230
WIJNNE & BARENDS	NEW ZEALAND	PETER SCHEEPS	—	DRY CARGO	3	1998	—
STENA LINE	SWEDEN	AESA	SPAIN	FERRY	2	1998	130
N.EUROPEAN TRAWLER S/ FOOT&BOWDEN/MC FABRICATIONS	U.K.	MC FABRICATIONS	U.K.	FISHING	3	—	8.1
BLUEWATER ENGINEERING	—	HITACHI ZOSEN	JAPAN	FPSO	1	1997	—
UNKNOWN	—	J PATTJE	NETHERLANDS	GENERAL CARGO	4	97/98	—
CARBOFIN	—	SESTRI CANTIERE NAVALE	ITALY	LPG	1	1998	57
WESTFAL-LARSEN	—	MITSUI ENG.&SHIPBUILDING	JAPAN	LPG	3	98/99	—
HANS & KLAUS HEINRICH	GERMANY	JJ SIETAS	GERMANY	MULTI-PURPOSE	6	1998	—
STATOIL	NORWAY	SAMSUNG H.I.	KOREA	MULTI-PURPOSE TANKER	1	1997	95
AP MOLLER	DENMARK	SIMEK	NORWAY	OFFSHORE	2	1998	75
KRUPP SEESCHIFFAHRFT	GERMANY	DAEWOO	KOREA	ORE CARRIER	2	12/97	145
MINISTRY OF DEFENCE	U.K.	FBM MARINE	U.K.	PASSENGER TRANSFER CRAFT	2	—	10
ISTANBUL DENIZ OTOBUSLERI	TURKEY	AUSTAL SHIP	AUSTRALIA	PASSENGER/FERRY	2	1996	—
DEUTSCHE FAHRGESELLSCHAFT (DFG)	—	VAN DER GIESSEN	NETHERLANDS	PASSENGER/RoRo	2	1998	116
CENARGO	U.K.	AESA (SEVILLA)	SPAIN	PASSENGER/RoRo	2	1998	—

(Continued on page 81)

**Alfa Laval LEO System
Installed In Gulf Of
Mexico**

This LEO system for crude oil dehydration was installed in the Gulf of Mexico after careful testing by a major U.S. operator. The centrifuge in the center of the photograph completely replaces all dehydration equipment



downstream of the free water knock-out tank to its right.

A LEO system for a nominal capacity of 60,000 BOPD weighs approximately 25-tons. A coalescer of an equivalent flow rate designed for 20-min. retention time would weigh approximately 160-tons.

For more information on Alfa Laval
Circle 98 on Reader Service Card

Owen-Short Marine Launches First Buoy Tender

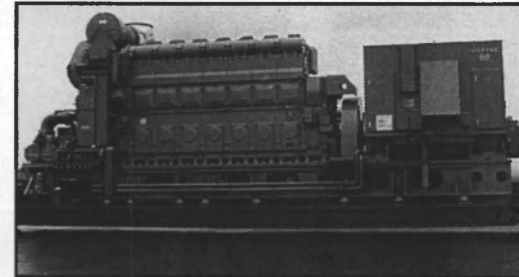
Owen-Short Marine of Bayou La Batre, Ala., has launched the first of four self-propelled buoy tending barges for the U.S. Coast Guard (USCG). Upon delivery, the 64 x 24 x 7-ft. (19.5 x 7.3 x 2.1-m) vessels will join the USCG fleet in the New Orleans district. Options for a fifth vessel are pending. Owen-Short Marine's parent company — Dohrman Machine Production Inc. of West Point, Neb. — has received a U.S. Army Corps of Engineers contract for the fabrication and delivery of 12 Spillway Gates for the Mobile, Ala. district.



For more information on Owen-Short Marine
Circle 102 on Reader Service Card

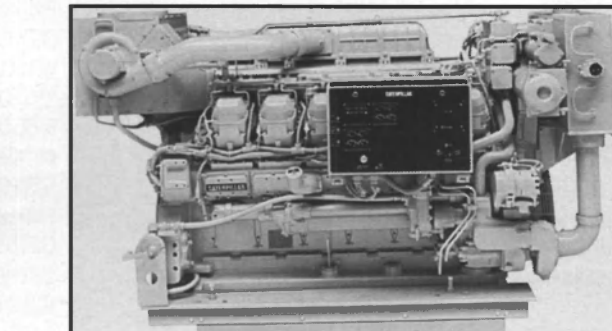
**MAN B&W Delivers L32/40-Type GenSets
To Danish Interest**

MAN B&W Diesel, Høleby has delivered L32/40-type GenSets to Odense Steel Shipyard Ltd. in Denmark for installation in the third container vessel of a large series of mega-container vessels from the shipyard, of which *Regina Maersk* was the first. The GenSet is based on the MAN B&W Group's L32/40 medium speed, four-stroke engine developed in Augsburg, Germany.



For more information on MAN B&W
Circle 12 on Reader Service Card

**Caterpillar 3500 Series B Engines Gain
Marine Society Type Approval**



Caterpillar Engine Division announced that the Cat 3500 Series B marine engines has become the first unit-injected, electronically-controlled marine engine to receive marine society-type approval from Lloyd's Register of Shipping and Bureau Veritas. Type approval was previously granted by the American Bureau of Shipping and Det Norske Veritas, and is pending with additional societies worldwide. The recent approval process focused on the electronic control system used by the Cat 3500 Series B engines, since type approval was granted previously for the engine mechanical design. Electronic control reportedly gives the engines superior fuel consumption and emissions control, as well as increased output.

For more information on Caterpillar
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Maritime Reporter/Engineering News

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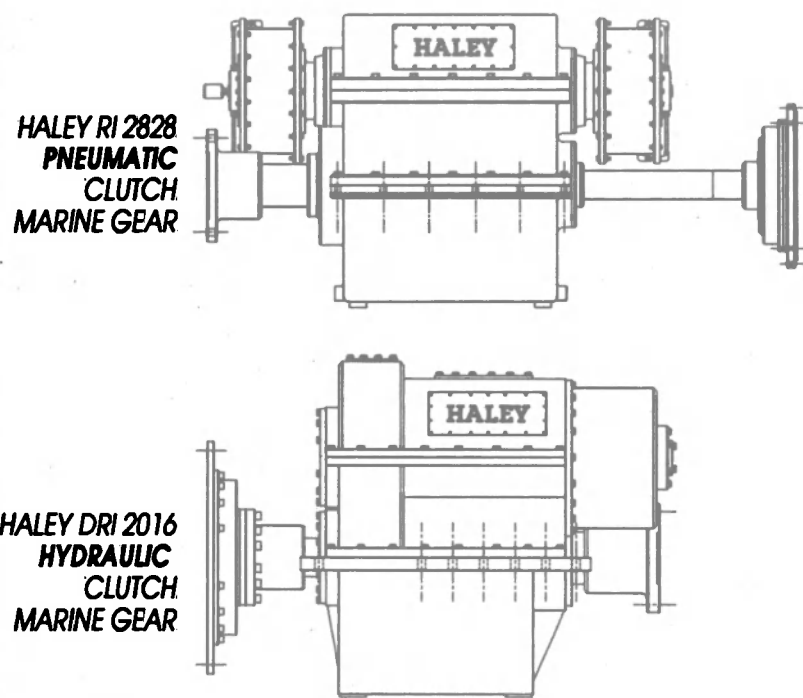
Principal Contracts Recorded, May 1996 (Continued from page 79)

Owner/ Operator	Country (Owner)	Shipyard	Country (Shipyard)	Ship Type	No.	Delivery Date	Price \$M
ISTANBUL DANIZ OTOBUSLERI	TURKEY	AUSTAL SHIP	AUSTRALIA	PASSENGER/RoRo FERRY	2	1997	—
MITSUI O.S.K. LINES	JAPAN	MINAMI NIPPON	JAPAN	PURE CAR CARRIER	1	97/98	—
MITSUI O.S.K. LINES	JAPAN	SHIN KURUSHIMA	JAPAN	PURE CAR CARRIER	1	1997	—
NIPPON YUSEN KAISA (NYK)	JAPAN	IMABARI SHIPBUILDING	JAPAN	REEFER	4	—	—
MARINE INSTITUTE	IRELAND	VISSER OF DEN HELDER	NETHERLANDS	RESEARCH	1	4/97	—
TOR LINE	—	FINCANTIERI	ITALY	RoRo	2	1998	129.4
DFDS/TOR LINE	—	FINCANTIERI	ITALY	RoRo	2	4/98	100
SOVCOMFLOT	RUSSIA	BRODOSPLIT	CROATIA	TANKER	2	1997	—
SOVCOMFLOT	RUSSIA	TROGIR	CROATIA	TANKER	1	1997	—
SOVCOMFLOT	RUSSIA	ULJANIK	CROATIA	TANKER	2	1997	—
MARNAVI	ITALY	NORDSOVAERTET	DENMARK	TANKER	1	5/97	—
FINAVAL	ITALY	NORDSOVAERTET	DENMARK	TANKER	1	9/97	—
LUKOIL-ARTIC-TANKER	RUSSIA	MTW	GERMANY	TANKER	2	—	85.7
MARITIMA FLUVIALE DI NAVIGAZIONE	ITALY	CANTIERE NAVALE FRATELLI	ITALY	TANKER	1	1997	35
MARNAVI	ITALY	CANTIERE NAVALE MARIO MORINI	ITALY	TANKER	1	5/98	—
MARNAVI	ITALY	CANTIERE NAVALE MARIO MORINI	ITALY	TANKER	1	12/98	—
BLUEWATER MARITIME	—	HITACHI ZOSEN	JAPAN	TANKER	1	2/97	30
UGLAND/STENA/NAS	—	TSUNEISHI	JAPAN	TANKER	1	7/98	90
GLAFKI MARITIME	GREECE	NIPPON KKK	JAPAN	TANKER	1	8/98	44.9
GLAFKI MARITIME	GREECE	NKK CORP.	JAPAN	TANKER	2	1998	44
LUNDOVIST REDERIENA	—	DAEWOO	KOREA	TANKER	1	2/98	41
STOLT NIELSEN	NORWAY	ASTILLEROS ESPANOLAS	SPAIN	TANKER	4	1998	186
SOCIEDAD NAVIERA ULTRAGAS	CHILE	ASENAV	CHILE	TUG	2	1997	—
CORY TOWAGE	U.K.	DAMEN SHIPYARDS	NETHERLANDS	TUG	2	1997	—
SWIRE OFFSHORE	—	ULSTEIN	NORWAY	TUG	2	1997	50
MOKSTER SHIPPING	NORWAY	AUKRA INDUSTRIER	NORWAY	TUG	1	4/97	26

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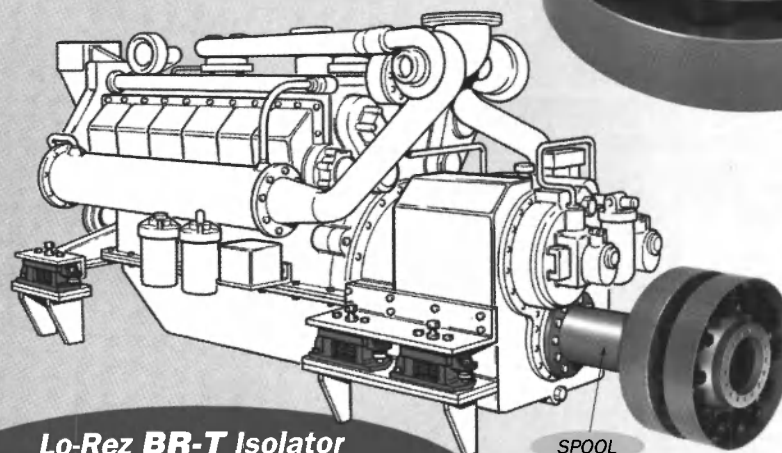
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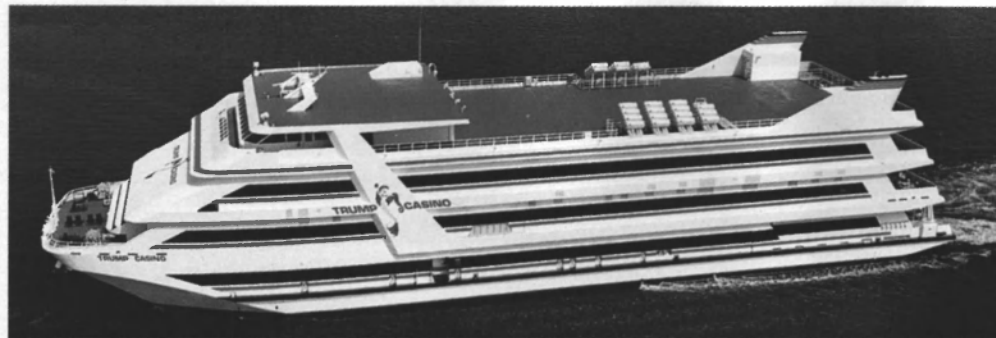
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Atlantic Completes Trump Casino

Atlantic Marine Inc. of Jacksonville, Fla., has finished construction of *Trump Casino*, built for Trump Indiana, Inc., for operation Trump Hotels & Casino Resorts Inc. The triple deck gaming vessel was scheduled to begin operation in May on Lake Michigan in Gary, Ind.

Designed by Rodney E. Lay & Assoc., Inc. of Jacksonville, Fla., the new Casino Cat is powered by two Detroit Diesel 1,200-hp DDEK main engines. Two Detroit Diesel 1,360-kW generator sets provide electrical power. Bow and stern thrusters, each

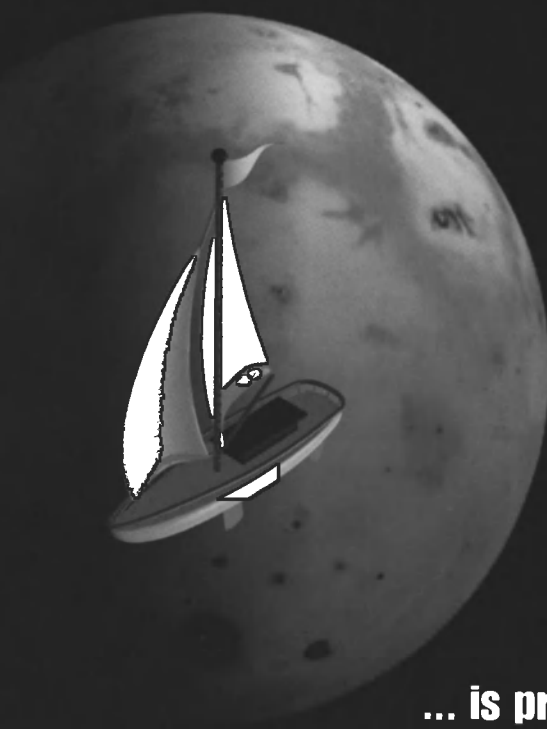
powered by a 530-hp DDEC engine, are also incorporated.

At 288 ft. (87.7 m), *Trump Casino* has 37,300-sq.-ft. of gaming space in the three ballroom-size decks, accommodating 2,000 passengers. The interior was designed by Interior Design International and installed at Atlantic Marine.

Atlantic Marine, Inc. is a builder of custom-designed vessels for domestic and international markets. In recent years, the company has been a leader in the construction of gaming vessels. *Trump Casino* is the eleventh casino boat built by Atlantic.

For more information on Atlantic Marine
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Pathway Offers New Line of Flouroelastomer Expansion Joints

Pathway Bellows has started manufacturing and shipping its new product line of flouroelastomer expansion joints. Ultraflex Ev4 expansion joints are produced using computer controlled processes with a high level of quality control built-in through each step of manufacture. Traceability of materials is maintained from the beginning raw material sources and throughout the manufacturing process.

For more information on Pathway
Circle 97 on Reader Service Card

Rice Granted Patent Pending Status Of Speed Nozzle

Rice Propellers, located in the North Pacific coast of Mexico, is a major supplier of propellers and nozzles for U.S. shipyards and fishing fleets. The company has recently developed the Rice Speed Nozzle Design and the Skewed Kaplan Propeller. Rice has been granted the Patent Pending Status from the Patent and Trademark Office of the U.S. Department of Commerce.

The Rice Speed Nozzle is reportedly a completely new design. The inside and outside shells are cambered and rounded. With these nozzles, users can reportedly obtain maximum thrust without losing free running speed.

In 1995, Rice Speed Nozzles were installed on 140 boats in the U.S. — mainly in the Gulf of Mexico and the East Coast. So far, in 1996, the nozzle has been installed on more than 90 boats.

For more information on Rice Propellers
Circle 92 on Reader Service Card

Austal Delivers Ferry To China

Zeng Chen Yi Hao is the name of the latest 40-m vessel completed by Austal Ships, and marks the twenty-sixth fast ferry built by the Australian vessel builder for Chinese owners. The delivery also continues Austal's close association with Yuet Hing Marine Supplies of Hong Kong, who has ordered the majority of these ferries on behalf of owners in the People's Republic of China.

The new vessel was built for the Zeng Cheng City Port Construction Development Co. and is to enter service on the 68-nm route between the Port of Xin Tang in mainland China and Hong Kong.

The vessel's lightweight aluminum construction and twin diesel engines provide a fully loaded service speed of 34 knots. It

has a relatively narrow beam of 32 ft. (10 m), and can accommodate 206 passengers on the main deck. Propulsion is provided by twin MTU 396TE74L diesel engines developing 1,980 kW at 1,940 rpm, each driving KaMeWa 71S waterjets through ZF BU755 gearboxes. The vessel was built to the China Classification Society standards. For more information from Austal Ship

Circle 59 on Reader Service Card



Zeng Cheng Yi Hao Particulars

Main engines	.....	MTU
Waterjets	.....	KaMeWa
Gearboxes	.....	ZF
Auxiliary engines	.....	MTU
Port of Registry	.....	Xin Tang, PRC
Classification	.....	China Classification Society
Length	.....	131.2 ft. (40.1 m)
Beam, molded	.....	32 ft. (10 m)
Draft, max.	.....	4.6 ft. (1.4 m)
Passengers	.....	268
Crew	.....	8
Fuel Capacity	.....	10,000 liters
Speed	.....	34 knots

U.S. Yard Sought To Harbor, Convert S/S United States

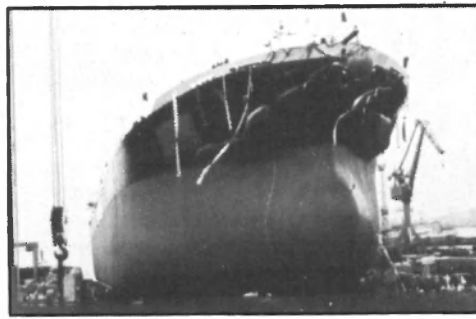
The S/S *United States* departed June 15 from Turkey for her return voyage to the U.S. This celebrated vessel is being brought back by its owner Marmara Marine Inc., which purchased the ship in 1992 and has moored her in Turkey.

Arrangements are now being made with a U.S. shipyard to harbor the vessel, and plans are underway to begin conversion. No specifics of the conversion, nor the name of the selected shipyard were announced.

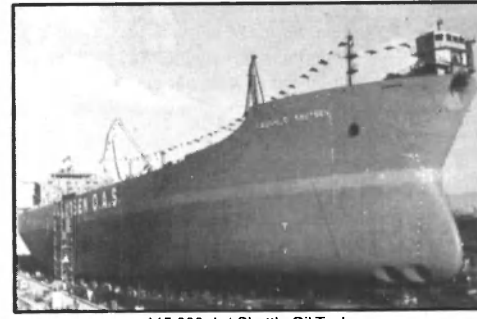
Towed by Smit New York, the U.S.-flagged vessel is expected to reach the eastern coast of the U.S. by the end of July. Marmara Marine Inc., a Delaware corporation, is owned by Edward A. Cantor, a major real estate developer in New Jersey and Palm Beach and Fred A. Mayer, CEO of both New York-based Marmara Marine and Commodore Cruise Line (Hollywood, Fla.). The S/S *United States* was built by Newport News Shipbuilding and entered transatlantic service in 1952. She was the most technologically advanced ocean liner of her day, designed by marine architect William Francis Gibbs of Gibbs & Cox, New York. On her first voyage she broke the speed record for crossing the Atlantic, a record kept throughout her 18 years of service that still stands today.

July, 1996

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

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BBN Acoustic Technologies, 70 Faucett St., Cambridge, MA 02138

ADHESIVES

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ABB Fisk Marine, Box 1043, S-436 21 ASKIM SWEDEN

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Carrier Transicold, P.O. Box 4805, Syracuse, NY 13211
Novenco Hi-Press AS, P.O. Box 310, Roskildevej 325A, DK-2630 Taastrup, DENMARK

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Munson Mfg., 780 Pearl Jensen Way, La Conner WA 98257
Workall, Inc., 10824 Bothell Hwy S.E., Bothell, WA 98012-8869

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Chemplex Environmental, 3405 Highway 33, Neptune, NJ 07753

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MCI Auctioneers, 2334 Willis Rd., Richmond, VA 23230

AUTOPILOT SYSTEMS

ConRay Marine, 1915 Stansburg Ave., Vancouver, B.C. CANADA

BALLAST

Mineral Research & Recovery Inc., 4620 South Coast Dr., Tucson, AZ 85714
Royal Chemical, P.O. Box 342, Gretna, LA 70054

BALLET STRAINER

Beard Industries, P.O. Box 31115, Shreveport, LA 71130

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B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401
Bohm & Voss Industrie GmbH, P.O. Box 100720, D-2000 Hamburg 1, GERMANY

BEARING

Kahleberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orion Corp., 1111 Cedar Creek Rd., Grafton, WI 53024
Orkot Engineering Plastics, 2335 Prairie Rd., Eugene, OR 97402
Thorson Bearings, Inc., 2225 Marway, Burlington, Ont., CANADA L7M 1A6

BIG LE OIL FUEL ABSORBER

Northstar Marine, 84 Wall Street, Farmingdale, NY 11735
RCF Marine, 3875 Fiscal Court, West Palm Beach, FL 33404

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Nelson Div., Exhaust & Filtration Sys., Hwy. 51 West, P.O. Box 428, Stoughton, WI 53589

BOAT SHAFING

Western Branch Metals, Inc., 2401 Wesley St., Portsmouth, VA 23707

BRIDGE WIRES

In-Mar Systems, Yellowstone Street, Kenner, LA 70064

BROKERS

151 Maritime Services, 34082 El Encanto, Dana Pt., CA 92629
Caplan Aided Company, Inc., P.O. Box 320486, Ft. Lauderdale, FL 33335
Jack Faulkner, 2419 Cady Lane, P.O. Box 371, Flossmoor, IL 60422
McWright's Tug & Barge Sales Corp., 35 De Hart St., Womansdown, UK O7960

BULKHEAD SEAL/PANELS

Bohm & Voss Industrie GmbH, P.O. Box 100720, D-2000 Hamburg 1, GERMANY
U.S.A. Repp, Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168
Farnes Specialists, Inc., 386 Dodge Drive, Temple, TX 76704

CABLE ASSEMBLIES

Times Microwave Systems, P.O. Box 5039, Wallingford, CT 06492

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NMP Corp., P.O. Box 35493, Tulsa OK 74153-0493
O.J. Gedney & Nelson Firestop, P.O. Box 276, Tulsa, OK 74107-0276

CAD/CAM SYSTEMS

AI Alpha Int'l., Inc., P.O. Box 498895, Cincinnati, OH 45249
Autoshop Systems Corp., 4403, 611 Alexander St., Vancouver, BC, Canada V6A1E
Creative Systems, Inc., P.O. Box 1910, Port Townsend, WA 98058
IMS2 20 Ridgely Ave., Annapolis, MD 21401

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Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
TIMSCO, P.O. Box 91360, Mobile, AL 36691

CHAOTIC PROTECTION SYSTEM

Electrocatalytic, Inc., 2 Milltown Ct., Union, NJ 07083

CHEMICALS

Ashland Chemical/Drew Amersol Marine, One Drew Plaza, Bostons, NJ 07005
Arlstar Systems, Inc., P.O. Box 1910, Port Townsend, WA 98058

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Buy-O-Systems, 3005 W. Carson St., Pittsburgh, PA 15204

COATINGS / COATINGS PROTECTION

Coroseal Inc., 1045 12th Ave. NW FSA, Issaquah, WA 98027
NACE Int'l., P.O. Box 218340, Houston, TX 77218-8340

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COMPOUNDS

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Autoshop Systems Corp., 4403, 611 Alexander St., Vancouver, BC, CANADA V6A1E
Chand Corporation, 157 Hwy 654, Mallowville, LA 70375
Creative Systems, Inc., P.O. Box 1910, Port Townsend, WA 98058
IMS2 20 Ridgely Ave., Annapolis, MD 21401
PlanKover Software, P.O. Box 536, Ledyard, CT 06339
Sener, O'Connell & Co., 4 Parque Tecnológico de Madrid, 28760 Tres Cantos - Madrid SPAIN
ADMAN Computer Inc., One Chestnut St., Nashua, NH 03606

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INC. 7052 22nd SW, Mountlake Terrace, WA 98043

CONTROL SYSTEM-Monitoring

Engne Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123
GEC ALSTHOM Desalls Inc., 10801 Kempwood Drive, Suite 1, Houston, TX 77043-1412
lan-Conrad Bergan, 3409 Gulf Breeze Pkwy, Gulf Breeze, FL 32561
IMD Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
MHC International, 80 Trip Dr., Iwaco, OR 97149

CONTROL VALVES

Robertson Marine Systems, 3000 Krogman St., Suite 207, Metairie, LA 70006
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COUPLINGS

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Mapoco Products, 90 Forest Avenue, P.O. Box 382, Louisa Valley, NY 11560
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McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, Bloom MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

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Crane & Crane, Inc., P.O. Box 809, Iron Mountain, MI 49801
T.C.W., 1607 port Barmouth Pl., Newport Beach, CA 92660
Tech Crane Int'l., Inc., 61120 Timberland Dr., Lubbock, LA 70445

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In-Place Machining Co., 1929 North Butlum Street, Milwaukee, WI 53212-3793

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Smith Berger Marine Inc., 516 South Chicago Street, Seattle, WA 98108

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Matrix Desalination, 329 S.W. 11th Ave., Fort Lauderdale, FL 33315
General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360

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Kenne Diesel, 4420 14th Ave. NW, Seattle WA 98107
Alaska Diesel, 4420 14th Ave. NW, Seattle WA 98107

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Coffey Industries, 701 Lawland Ave., Newark, NJ 07102
Cummins Engine Co., 4500 Leeds Ave., Ste. 301, Charleston, SC 29405-8521
Cummins Mid-South, Inc., 110 E. Airline Highway, Kenner, LA 70062
John Deere, John Deere Rd., Moline, IL 61255
MAN B&W Diesel AG, Stadthausstrasse 1, D-46153 Augsburg 1, GERMANY
MAN B&W Diesel AS, Teghøvedgade 41, DK-2450 Copenhagen SV, DENMARK
MAN B&W Diesel, 17 State St., New York, NY 10004
Motor Service AB, Box 2115, S-14 04 Rominge, SWEDEN
Motor Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315
Nor-Tech, Inc., 100 Wall St., New York, NY 10005
Parman Diesels, P.O. Box 6, Parman Works, Colchester, Essex, CO1 2HW, ENGLAND
Ustein Bergen AS, PO Box 924, NS02 Bergen, NORWAY
Wartsila Diesel, 201 Delaware Highway, Annapolis, MD 21401

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J.W. Fetters, 65 Anthony St., Berkeley, MA 02779
Mudson Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

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Mapoco Waz & Krenzer, Inc., 90 Forest Ave., Louisa Valley, NY 11560

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Kokum Sonos, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70058
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY

ELECTRONIC INFORMATION SUPPORT

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

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Haisor Topsoe Nymolevel 55, DK-2800, Lyngby, Denmark

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Marine Jobs, Inc., 800 Downtowner Blvd. Ste. 111, Mobile, AL 36609

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

ENGINE - EFFICIENCY/TEST EQUIPMENT

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General Thermodynamics Corp., P.O. Box 1105, Plymouth, MA 02360
Stellar Marketing, 7759 Townsend Place, New Orleans, LA 70126

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Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130

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Jon M. Lisa Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

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Clare Electronics, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Clabe Co., Inc., 645 Forest Edge Drive, Vernon Hills, IL 60061-3106

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Kahleberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Schuyler Mfg. Co., Inc., 1601 Woodville-Hadmond Rd., Woodville, VA 98072
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook, VA 22624
Ultra Poly Inc., 2926 South Steele, Tacoma, WA 98409
Viking Fender Co., 1160 State St., North Astory, NJ 09861

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Killed Signal, Meyer I Box, 101 Columbia Rd., Morristown, NJ 07962

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Everpure Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
Luber-Finer, Inc., 5050 Quorum Drive, Dallas, TX 75240

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GENERATOR

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Coffey Industries, 701 Lawland Ave., Newark, NJ 07102
Nashyodogawa-u, Osaka, JAPAN

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KSB Corporation, U.S. Repp, Simplex-Turner Inc., P.O. Box 168, Little Neck, NY 11363-0168

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Zodiac of North America, P.O. Box 400, Stevensville, MD 21666
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Stearns Manufacturing, P.O. Box 1498, St. Cloud, MN 56302
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Archway Marine, 4501 Swan Ave., St. Louis, MO 63110
Dalton Inc., P.O. Box 1150, Kinder, LA 70648
Golden Marine, 160 Van Brunt St., Brooklyn, NY 11231
Kocham Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
L.C. Doane, P.O. Box 975, Essex, CT 06426
Caulon Electric Mfg. Co., Inc., 1615 N. Main, P.O. Box 53, Pearland, TX 77581
Francis Searchlights/Beam Supply Co., 4415 6th N.W., Seattle, WA 98107
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Midland Mfg. Corp., 7733 Gross Point Rd., Skokie, IL 60076-0226
LIQUID OVERFILL PROTECTION SYSTEMS
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Nortlage, Inc., 59 Porter St., Littleton, CO 80120
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie, IL 60076-0226
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Maritime Power 200 Henderson St., Jersey City, NJ 07302
New England Traveler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Wolcott Coast Machinery, 1929 Wilson Rd., Glenview, IL 60025
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Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33431
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031
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Hydro-Aluminum, Vik Verk, N-5880 VIK I SOGN, Norway
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
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Hopeman Brothers, Inc., P.O. Box 820, Weymouth, VA 22980
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Rebby, P.O. Box 1600, Sapulpa, OK 74067
MARINE DOCKING
Tribar Industries, 1705 Flint Rd., Downsview, Ontario CANADA
MARINE DRILLING & BLASTING
Morris Drilling & Blasting, P.O. Box 1955, Jacksonville, FL 32247-0455
MARINE ELECTRONICS
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Kocham Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Marine Electronics Solutions, Inc., 1322 Crabapple Cove, Jacksonville, FL 32225
Saab Marine Electronics AB, Box 19345, 402 S1 Gøteborg, SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
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The Falk Corp., P.O. Box 462, Milwaukee, WI 53201-0462
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MARINE INSURANCE
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Cranall Dry Dock Eng'g., Inc., P.O. Box 505804, Chelsea, MA 02150
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Astilleros Españoles Delivers Tuna Purse Seiner



Astilleros Espanoles' Barreras yard in Vigo, Spain, recently delivered a large tuna purse seiner to Albacora SA three months ahead of schedule. The DNV-classed vessel, named *Albacora Uno*, is 344.4 ft. (105 m) long and 53.1 ft. (16.2 m) wide, with a draft of 23.9 ft. (7.3 m). Wartsila engines provide the main propulsive power, with auxiliary power by Caterpillar, propellers by Navalips SA, gearboxes by Renk Tacke and navigational systems by Furuno.

The Barreras yard has also signed contracts with Spanish owners Atunsa and Naviera Albacora and French owner Saupiquet for the construction of four additional fishing vessels — purse seiners ranging from 344.4 ft. to 354.3 ft. (105 to 108 m) in length. These vessels will reportedly be the largest of their type in existence, and one ship will contain a complete factory, with the capability to complete all the steps of freezing and producing tuna fillets. Bureau Veritas has been named as the classification society for these ships.

For more information on Astilleros Espanoles
Circle 140 on Reader Service Card

RECENT SHIP SALES

This report, compiled by Shipping Intelligence, Inc., a New York maritime consulting firm, tracks sale prices of secondhand bulk carriers and tankers. For more information, call (212) 997-0966.

Date Reported	Vessel Name	Vessel Type	DWT	Year Built	Sale Price (M)
5/20/96	Sirorat Naree	Bulker	11,283	82	\$4.8
6/3/96	William Shakespeare	Bulker	15,328	78	\$3.3
5/28/96	Lapithos	Bulker	18,380	79	\$4.5
5/20/96	Seabreeze One	Bulker	19,201	83	\$1.7
5/28/96	China Power	Bulker	22,170	81	\$6.4
5/20/96	Ocean Wave	Bulker	23,790	83	\$8.7
6/3/96	Adriatic Prestige	Bulker	23,947	76	\$3.1
6/3/96	Lori E	Bulker	25,541	74	\$2.3
5/28/96	Valeric C	Bulker	26,814	80	\$6.3
6/10/96	Nirja	Bulker	30,255	72	\$2.3
5/20/96	Thornhill	Bulker	37,971	82	\$13.5
5/20/96	Milos	Bulker	43,214	84	\$12.3
6/7/96	Wild Rabbit	Bulker	46,440	76	\$3.5
5/28/96	Toyoshima Maru	Bulker	64,471	82	\$11
6/7/96	Verazzano	Tanker	11,815	83	\$7
6/3/96	Mar Sofia	Tanker	15,460	79	\$4.5
5/20/96	Rezvaya	Tanker	16,540	76	\$8.1
6/10/96	Chuy	Tanker	24,083	83	\$13
5/20/96	Kiinos	Tanker	30,289	71	\$2.8
5/28/96	Kithnos	Tanker	30,318	71	\$2.6
6/3/96	Ensis	Tanker	30,990	79	\$8.1
6/7/96	Pluto	Tanker	31,302	81	\$8
5/20/96	Seafortune	Tanker	32,214	75	\$5
5/28/96	Meltemi	Tanker	36,981	76	\$5
5/28/96	Shoseki Maru	Tanker	60,959	79	\$8.1
6/7/96	Reliable Energy	Tanker	62,482	90	\$22
5/20/96	Caribou	Tanker	85,410	74	\$4.6
5/28/96	Era	Tanker	94,287	87	\$26.5
5/28/96	Canopus	Tanker	94,347	86	\$26.5
6/10/96	Artemis Garafalidis	Tanker	112,745	77	\$6.9
5/20/96	Aiisa Craig	Tanker	240,260	74	\$8.6



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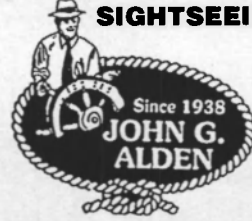
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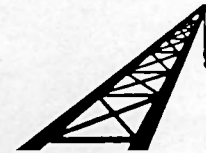


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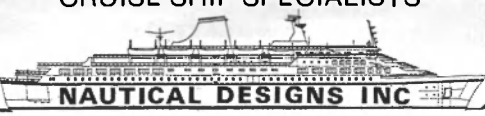
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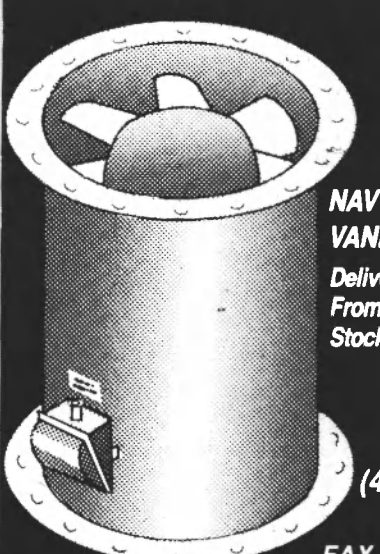
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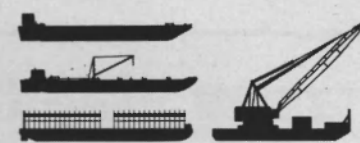
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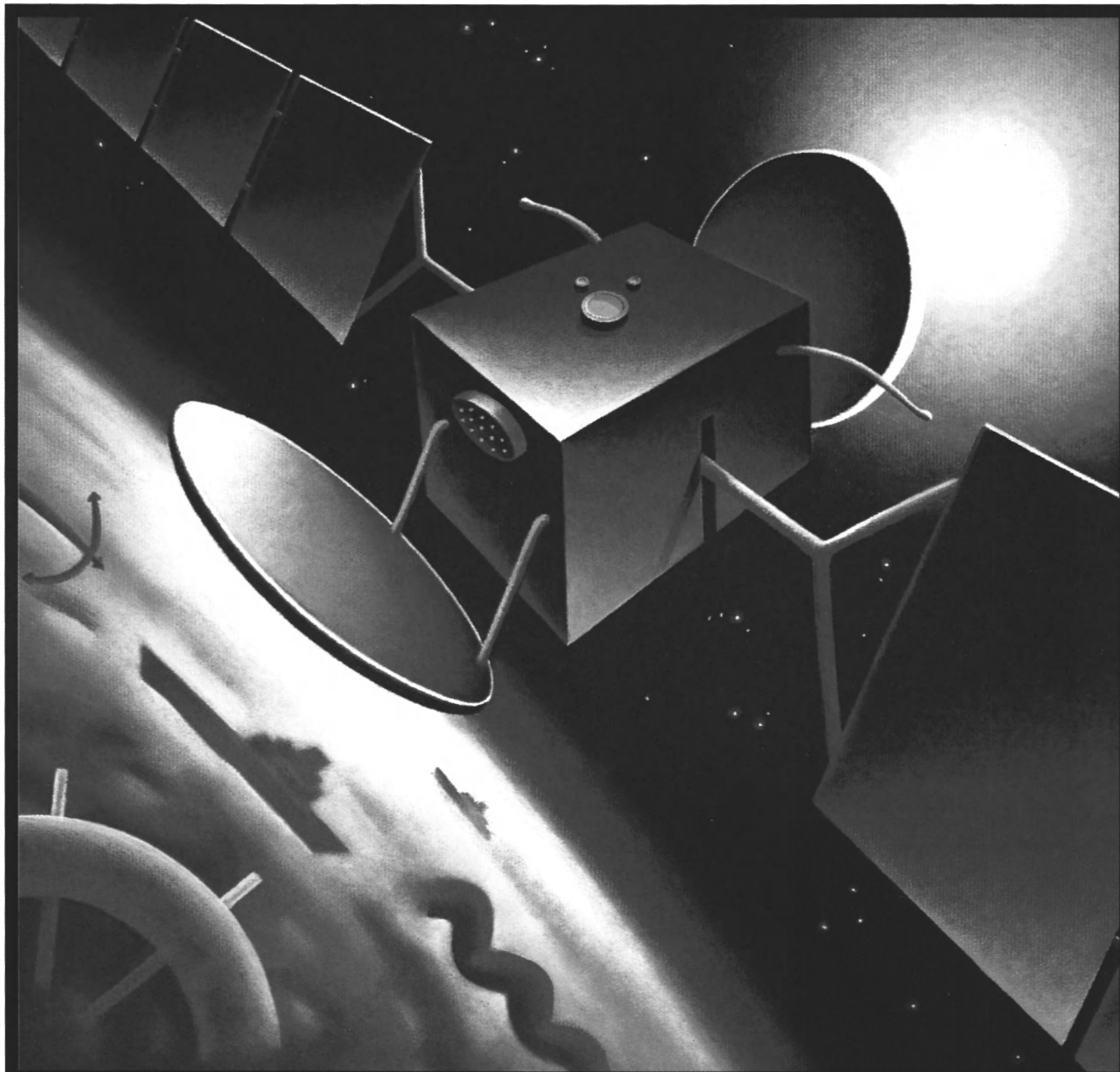
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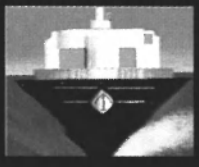
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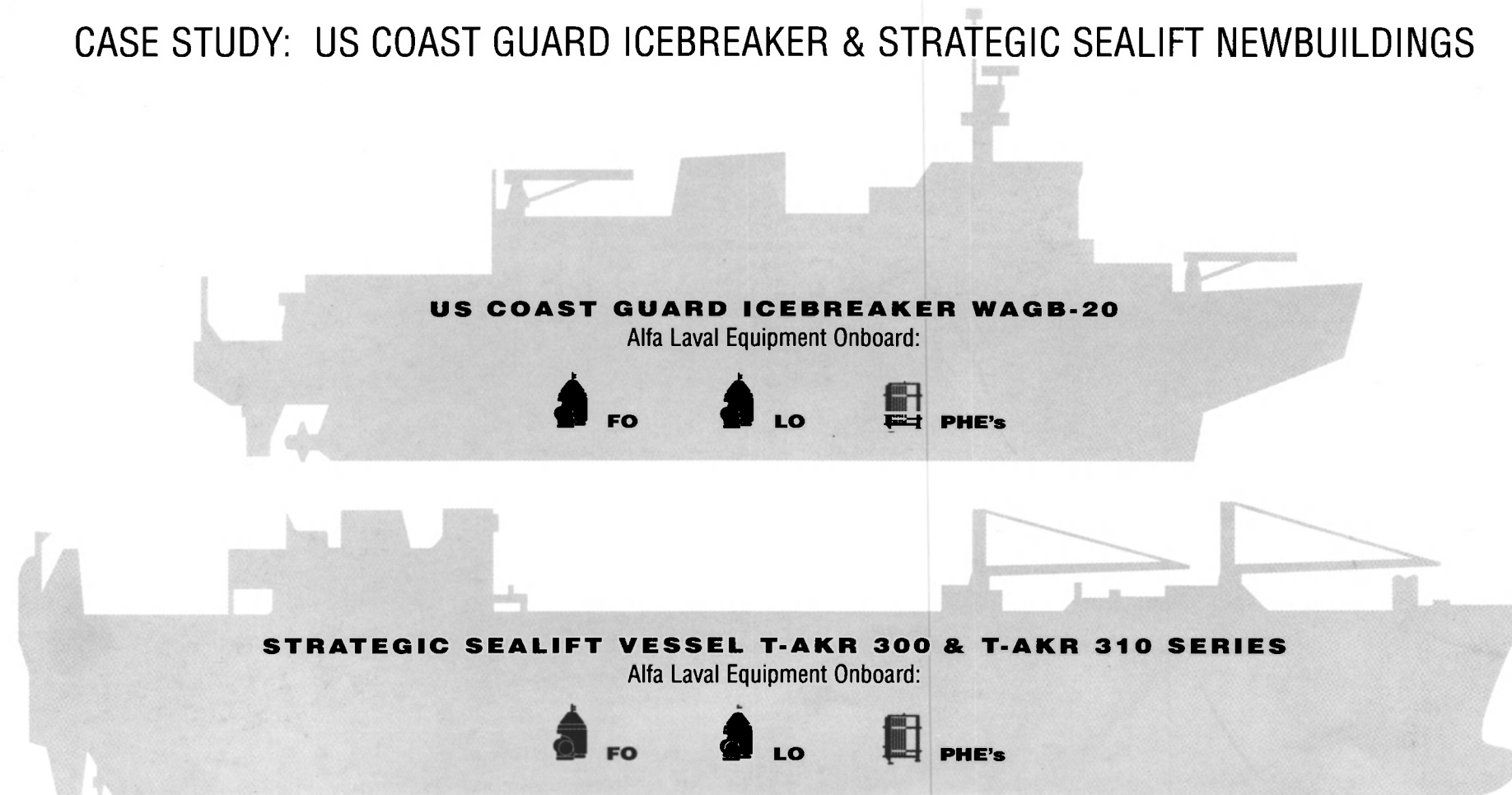


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