

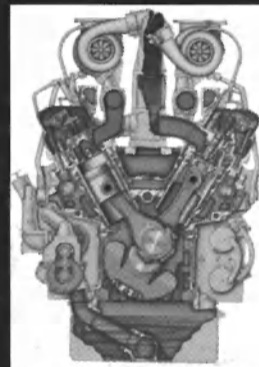
MARITIME REPORTER AND ENGINEERING NEWS

CRUISE SHIPS

Massive expansion
planned through 1998

New ship series development
discussed by major operators

PLUS:
MR/EN's
Marine
Propulsion
Technology
Guide &
Directory



Also in this issue: Megayacht market gets busy • New IMO regs on coatings to come

FEBRUARY 1995

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ON THE COVER

Featured on this month's cover is the Baglietto-built *Opus*, a vessel with raceboat excitement and megayacht style interior, propelled via KaMeWa waterjets. A full report on the megayacht business — in the U.S. and in Europe — starts on page 57. The inset picture is a diagram of the recently introduced Caterpillar 3500 Series B engines. For more information on this versatile new engine, turn to page 44. Other propulsion technology updates, and a comprehensive **Marine Propulsion Directory**, start on page 84.

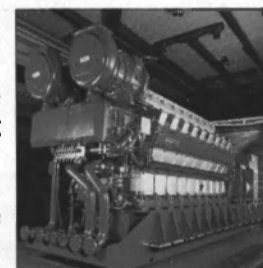
46 CRUISE SHIP ANNUAL
 Cruise ship capacity is set to expand dramatically through 1998. Get an insight into factors contributing to long term market growth, as well as a round up of the latest multi-million dollar ordering spree.
 by Greg Trauthwein, Editor



57 PICKING UP SPEED...
 Megayacht builders attribute a rise in orders to a growing economy.
 by Dan Manjotis, Senior Editor



84 MARINE PROPULSION SELECTION GUIDE
 Propulsion component manufacturers — driven by mandates concerning the environment and cost of operation — innovate to compete. Catch up on the latest technological advancements. **PLUS:** The Marine Propulsion Directory.



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No. 2

Volume 57

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Alabama Yard Signs Letter Of Intent To Build Four Bulkers

Alabama Shipyard, a Mobile, Ala.-based company and an affiliate of Atlantic Marine, Inc., announced it has signed a letter of intent for four 27,000-dwt handysize bulk vessels to be built for interests represented by Tritea Maritime Ltd. of Piraeus, Greece.

The agreement is subject to the arrival at a mutually agreeable con-

tract and approval of Title XI fund-

ing. The handysize bulk vessels are designed by Mitsubishi Heavy Industries (MHI) of Tokyo, Japan.

Alabama Shipyard, Inc. is a subsidiary of Atlantic Marine Holding Company of Jacksonville, Fla.

For information on Alabama Shipyard Circle 99 on Reader Service Card

MHI-designed bulk carrier particulars

Length o.a.	543 ft. (165.5 m)
Breadth molded	88.5 ft. (27 m)
Depth molded	43.5 ft. (13.3 m)
Draft molded	30.5 ft. (9.3 m)
Deadweight	25,900 t
Complement	25 persons

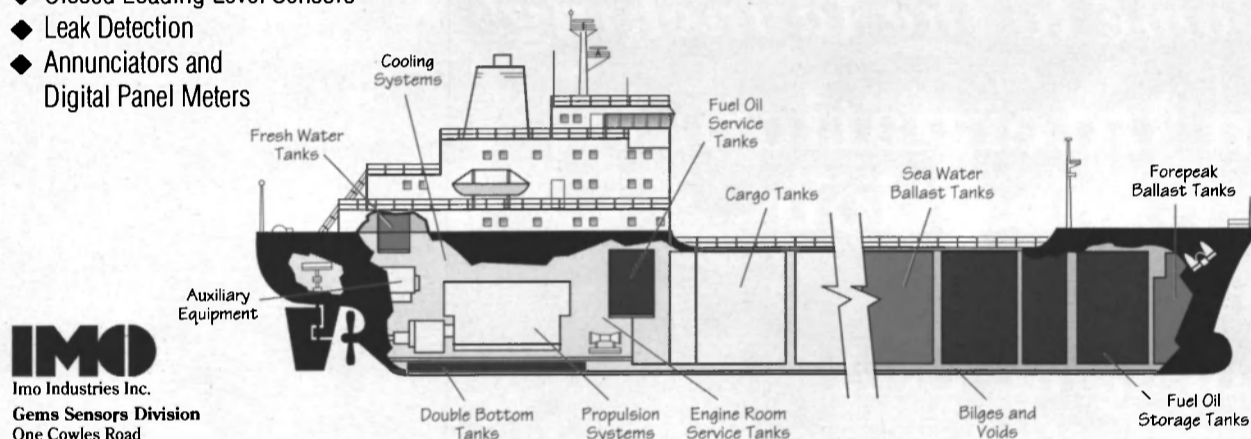
For more TITLE XI funding request news, turn to page 94 of this issue.

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scription information contact Dale Barnett,
fax: (212) 254-6271.

Comsat Invests \$147 Million In Global Handheld Communications Service

Comsat Corp. announced it will invest \$147 million in the Inmarsat-P company that will provide global handheld communications services by the year 2000. Inmarsat-P users will be able to communicate anytime, anywhere using a handheld unit similar to a cellular phone, a unit that will cost less than \$1,000 and operates through both satellite and cellular links. Users will pay about \$2 per minute.

"Satellite-based handheld communications will be a \$10-billion business in 10 years," said **Ron Mario**, president of Comsat Mobile Communications. "With our investment in Inmarsat-P, Comsat will be a major player in this market."

Comsat's investment includes a direct commitment of \$94 million to the new company, \$20 million through Comsat Argentina, and approximately \$33 million through Comsat's ownership share of Inmarsat's \$150 million investment in Inmarsat-P. The Inmarsat-P system will be comprised of 10 satellites in intermediate circular orbit (ICO) and will cost \$2.6 billion. The Inmarsat-P company will own and direct the operation of the satellite system and 12 interconnected satellite access nodes (SANS). These nodes will handle signal processing, call routing and switching, and will be geographically located for efficient global coverage.

For more information on Comsat
Circle 142 on Reader Service Card

Thrustmaster Wins Contract

Thrustmaster International's model A35J azimuthing bow-thruster was chosen for a new series of Offshore Patrol Vessels (OPV) to be built for the government of Mauritius by ASMAR Shipbuilding & Docking Co. Thrustmaster Intl. manufactures a range of azimuthing bowjets ranging from 100 to 6,000 hp.

For more information on Thrustmaster
Circle 146 on Reader Service Card

SCA Moves To Alexandria

The office of the Shipbuilders Council of America (SCA) has been moved from Arlington, Va. to Old Town Alexandria. The new address is Suite 204, 901 North Washington Street, Alexandria, Va. 22314; tel: (703) 548-SHIP, fax: (703) 518-0276.

Fidler Named AIMS Chairman

James Fidler was elected chairman of the board for the American Institute of Merchant Shipping (AIMS) for 1995. AIMS, the national maritime trade association, is entering its 27th year of service to the U.S. merchant marine.

AIMS is a national trade associa-

tion representing 23 U.S.-flag carriers which own or operate approximately 11 million dwt of tankers, dry bulk carriers, container ships, and other oceangoing vessels.

MIT To Join FastShip Atlantic Research

FastShip Atlantic, Inc. and the Massachusetts Institute of Technol-

ogy (MIT) announced a long-term program to collaborate in research and development of a new high-speed freighter that its organizers say can revolutionize ocean transportation of high-value cargo.

MIT has agreed to assist with marketing research and long-term technical research for the new high-speed ship technology on which FastShip Atlantic's proposed 1998 service is based.

The MIT/FastShip agreement

calls for close R & D collaboration; MIT to participate in the ongoing research, application and refinement process to continually improve the basic FastShip technology; MIT to assist in the transfer of its new innovations (predominantly through license agreements) so the public can benefit from this technology; and for MIT to assist in the estimation of the market for manufactured goods and parts that can be carried by FastShip technology.



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Then we introduced our ABS SafeHull™ Condition Assessment Services for existing tankers in January 1994.

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The system is based on the same fundamental design principles as for tankers. It's adjusted for determination of the specific dynamic loads which act upon a bulk carrier at sea. The system identifies critical structural areas that require enhancement, by more effective distribution of steel, to lower the ship's operating stresses.

ABS SafeHull™ for bulk carriers benefits designers, owners and operators. It helps reduce the risk of structural failures, thereby lowering your life-cycle maintenance and repair costs. SafeHull fulfills the ABS mission of promoting the safety of life and property at sea.

For more information about SafeHull, contact your nearest ABS office.

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Blount-Built *Niagara Prince* Commences Cruising

The 175-ft. (53-m) *Niagara Prince* — built for American Canadian Caribbean Line, Inc. (ACCL) by Blount Industries of Warren, R.I. — is designed for canal and river cruising, and is the first overnight passenger vessel in more than 100 years to offer passage along the entire length of the Erie Canal, from Albany to Buffalo.

The vessel, which accommodates 84 passengers in 42 cabins, has a unique feature allowing it to cruise under low bridges. The crew can lower the vessel's pilothouse and dismantle the superstructure to give it an air draft of 16.75 ft. (4.4 m). The M/V *Niagara Prince* is certified by the U.S. Coast Guard for cruising in North American waters, but also carries a full SOLAS 74 certificate for cruising coastal waters, such as Panama, Virgin Islands, Belize and the

Orinoco River. The *Niagara Prince* joins the *Caribbean Prince* and the *Mayan Prince* in ACCL's fleet of small cruise ships.

For more information on Blount Industries
Circle 141 on Reader Service Card

Ulstein Wins Deck Machinery Order

Ulstein Deck Machinery (UDM) won an order for what is reportedly the world's largest towing winch from Edison Chouest Offshore. The complete winch package includes a double towing winch with a bollard pull of 2 x 500 tons and is due for delivery at the end of 1995. Awarded in close collaboration with Ulstein USA in Seattle and UDM company Ulstein Brattvaag in western Norway, this order is the 12th placed with the group by Edison Chouest.

For more information on Ulstein Deck Machinery
Circle 144 on Reader Service Card

Maritime College Seeks President

The State of New York (SUNY) Maritime college invites applications for the position of president of the college. The Maritime College is one of 64 colleges within SUNY, specializing in engineering, transportation and marine environmental sciences. To nominate an individual for the position, to apply for the position, or for additional information, contact: **Raymond P. Hayden**, chairman, Presidential Search Committee, State University of New York Maritime College, 6 Pennyfield Ave., Fort Schuyler, Bronx, N.Y. 10465-4198.

C&M Tech. Wins \$1 Million Contract

C&M Technology won a contract from the Naval Undersea Warfare Center Div. to design and build a Deep Depth Pressure Vessel. The contract is valued at \$1.06 million.

For more information on C&M Technology
Circle 147 on Reader Service Card

Willard Marine Appoints Avon Marine As National Representative

Willard Marine, Inc. announced that Avon Marine of Irvine, Calif. will represent Willard Marine's line of Sea Force commercial rigid inflatable boats (RIBs) ranging in size from 17.7 ft. (5.4 m) to 24 ft. (7.3 m).

For more information on Willard Marine products
Circle 148 on Reader Service Card

Leica Names Tolman Manager, Marine GPS Sales

The Leica Navigation and Positioning Division has named **Stuart Tolman** as manager, marine sales, for its line of Global Positioning System (GPS) products. He assumes responsibility for sales to commercial and recreational marine markets. Mr. Tolman comes to Leica from Magellan Systems of San Dimas, Calif.

For more information on Leica
Circle 136 on Reader Service Card

Moore Named Nat'l Sales VP For Shelby Williams

Shelby Williams Industries has appointed **Michael E. Moore** vice president, national sales. Mr. Moore joined Shelby Williams in 1993 with responsibility for international sales, and assumed his additional duties effective Jan. 1, 1995. Also, Shelby Williams announced that **Kurt J. Keller** has retired from the company as senior vice president.

For more information on Shelby Williams
Circle 139 on Reader Service Card

Latham Made Marketing Manager For Detyens Shipyards

Walter Latham has been appointed to the newly-created position of business development marketing representative at Detyens Shipyards.

Mr. Latham comes to Detyens Shipyards with more than 23 years of experience in the shipping field. For the last four years, Mr. Latham has worked for International Ship as marketing manager.

Detyens Shipyard has been in operation nearly 40 years, has two drydocks equipped for vessel up to 600 ft. (183 m), and recently expanded its operations to the Jacksonville, Fla. port.

For more information on Detyens Shipyards
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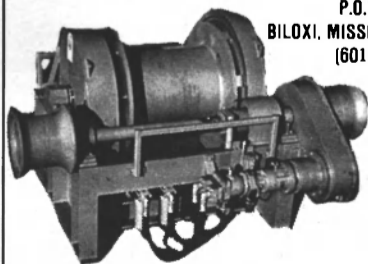
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Every 5,000 hours this towboat makes a change for the future.

Changing oil every 5,000 hours instead of every 500 has made a world of difference to Crouse Corporation's single-screw towboat, the *M/V Sue Chappell*. Before the workboat switched to synthetic Mobilgard SHC 120 in its generator engine, it was changing oil every 500 hours and disposing of 112 gallons of waste oil each year.

For the environmentally concerned Crouse Corporation of Paducah, Kentucky, waste oil disposal was a problem that demanded a solution.

The synthetic solution. Crouse Corporation, Detroit Diesel Corporation and Mobil Oil Corporation conducted an 8,000 hour test of Mobilgard SHC 120 in the towboat's generator engine. The synthetic lubricant, with its chlorine level well below the most stringent regulations in effect today, yielded remarkable results.

Mobilgard SHC 120 significantly extended the towboat's oil drain intervals and reduced its annual volume of waste oil 90%. A single oil drain after 5,100 hours of continuous operation of the engine confirmed the oil effectively lubricated the Detroit Diesel 6-71 engine *10 times longer than mineral oil*. Annual waste oil was now just 11 gallons.

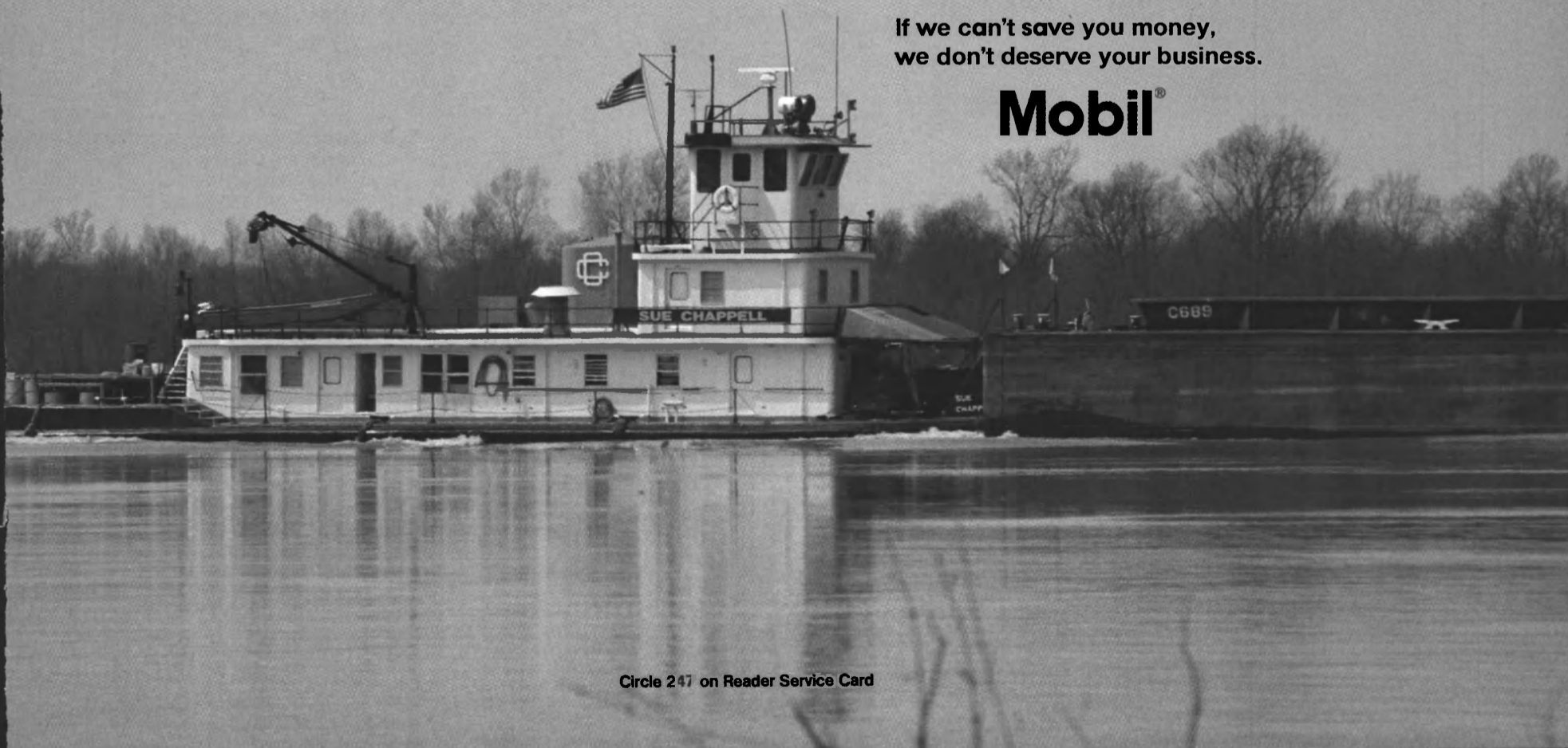
Mobilgard SHC 120 cut the engine's oil consumption by nearly 75%. The generator consistently used *only one quart* daily. Quite a difference from the one gallon of mineral oil it typically consumed.

Mobilgard SHC 120 reduced overall engine wear by almost 50%. When the towboat was overhauled, engineers found that the engine's piston rings and cylinder liners had only about half the normal wear rates. Time between overhauls is now projected to extend from 40,000 hours to 60,000 hours.

So take a good look at the synthetic lubricant that helped this towboat make a difference in the world. And a change for the future.

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Casino Riverboat Roundup

President Casinos Does Not Receive Iowa License: President Casinos, Inc. announced that the Iowa Racing and Gaming Commission did not award any licenses to applicants seeking to operate riverboat gaming facilities in Carter Lake, Iowa. Two licenses were awarded to operate riverboat gaming facilities in Council Bluffs, Iowa. President Casinos said that it is currently considering several proposals for the vessel it intended to utilize had it received a license,

including arranging an outright sale or lease. The company is expected to make an announcement in the near future regarding its intentions for the vessel.

Ameristar Plans \$75 Million Development In Iowa: Ameristar Casinos Inc. of Jackpot, Nev., was awarded a riverboat gaming license by the Iowa Racing and Gaming Commission to develop a \$75 million destination resort along

the Missouri River in Council Bluffs.

Ameristar has a strong background in the gaming and hospitality industry dating back to 1954. Ameristar's effort to secure the license was led by Vice President of Development **Ken Edmunds** and Director of Governmental Affairs **Jeff Terp**. Ameristar now turns its attention to the construction phase and intends to break ground next month, with plans to open within one year. The historically themed riverboat planned for the site will be 272 ft. (82.9 m) long by 98 ft. (30 m) wide with a 27,500-sq.-ft. casino. The riverboat will feature more than 900 slot machines and 37 table games. In addition to Ameristar, the Commission awarded a riverboat gaming license to Harveys Casino Resorts of Lake Tahoe, Nev.

Players In Agreement To Acquire Showboat Star Riverboat Casino: Players International, Inc. announced that it has signed a preliminary agreement to acquire the Showboat Star Casino, and move it to its riverboat site in Lake Charles, La. Financial terms of the agreement were not disclosed. Completion of the agreement is subject to regulatory approvals from the Louisiana Riverboat Gaming Commission, the Louisiana State Police and other governmental agencies.

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Halla Engineering Buys Tribon System

Halla Engineering & Heavy Industries, South Korea, has bought the initial design, work preparation, hull and complete outfitting applications of the Tribon shipbuilding system, by Kockums Computer Systems, for the design and production of vessels, at its new shipyard in Sambo. Installation is scheduled for this month, and the shipyard is expected to start production in April.

For more information on Tribon
Circle 129 on Reader Service Card

Mar-Com Signs On To Operate In PSY

Mar-Com, Inc. of Vancouver, Wash. has a use agreement to operate in Portland Ship Yard (PSY). The agreement allows Mar-Com access to all PSY drydocks, facilities and services. Mar-Com joins Cascade General as the only other company operating in PSY.

For more information on PSY
Circle 125 on Reader Service Card

Sperry Marine Earns ISO 9001 Certification

Sperry Marine Inc. has been awarded ISO 9001 registration by ABS Quality Evaluations, Inc. "Receiving ISO 9001 registration is a most welcome recognition and verification of Sperry Marine's quality achievements for our customers," said Executive Vice President **John V. DeMaso**. Sperry Marine, headquartered in Charlottesville, Va., manufactures a wide range of commercial and military marine navigation products.

For more information on Sperry Marine
Circle 143 on Reader Service Card

Oronite Additives Names Managers

Charles McCaffree has been named sales manager, and **Bruce Anderson** has been named business manager, of the Americas Region for Oronite Additives of Houston. Mr. McCaffree is responsible for sales, sales support and customer strategies for North America and Latin America. Mr. Anderson is responsible for marketing and technical service in North and South America for all of Oronite's product lines.

Maritime Reporter/Engineering News

Cegelec Chosen To Power Four RCCL Ships

Cegelec was selected by Kvaerner Masa-Yards to supply the electrical package — including all equipment for on-board power generation and main electrical propulsion with the synchrodrive solution — for a second cruise ship for Royal Caribbean Cruise Line (RCCL). The first order was last spring. Per ship, Cegelec will provide two 17MW-143/145 rpm synchronous motors associated to 12-pulse synchroconverters.

Cegelec was also awarded a contract from Chantiers de l'Atlantique for the electrical package for a pair of cruise ships (one firm, one option) also for RCCL.

For more information on Cegelec
Circle 123 on Reader Service Card

Austal Delivers Ferries To Turkey

Austal Ships delivered a pair of 98-ft. (30-m) aluminium monohull ferries to Turkish operator Istanbul Deniz Otobusleri, the company's first sale to the eastern Mediterranean region.

The two new vessels will complement the operator's existing fleet of 10 ferries.

Dubbed the *Aksemseddin* and the *Ertugrul Gazi*, each vessel has a capacity of 155 passengers, can achieve a speed of 25 knots fully laden, and is worth \$2 million.

Each vessel is powered by a pair of MTU 8V 396 TE 74 diesel engines developing 832 kW at 1,900 rpm driving KaMeWa FF Jet 550 waterjets through ZF BU255 marine gearboxes. The vessels were surveyed to DNV classification.

For more information on Austal Ships
Circle 124 on Reader Service Card

Oceaneering In Letter Of Intent With South African Firm

Oceaneering Intl. Inc.'s production contracting division — Oceaneering Production Systems (OPS) — received a letter of Intent from Soekor (Proprietary) Ltd., the national oil and gas exploration/production company of the Republic of South Africa, to develop and produce Soekor's offshore E-BT oil field and adjacent discoveries. OPS has started funded engineering work to provide a detailed E-BT development cost estimate, currently assessed at \$75 million, and to confirm the feasibility of the project.

Negotiations are in progress to finalize a definitive agreement by mid-March 1995 which will then be submitted to Soekor's, Engen's, and Oceaneering's respective boards of directors and to the government for final approval.

The development plan for the E-BT field is based upon the use of subsea completed wells producing

to a Mobile Offshore Production System (MOPS).

For more information on Oceaneering
Circle 126 on Reader Service Card

Marco Wins Contract To Build Tug

The shipyard division of Marco Seattle, Inc. won a contract to design and build a 105-ft. (32-m) trac-

tor tug for Tractor Marine, Inc.

The vessel will be operated by Alaska Marine Charterers Inc. under contract with Sealand Services. The tug will be a reverse tractor configuration with 360-degree steerable Ulstein 1650H Z-drive propulsion units driven by Caterpillar's newly developed electronically controlled combustion 3516-DITA diesel engines for a combined 4,000 bhp.

"We are extremely pleased to be teaming up with **Bob Schoenbachler** and **Jim Weimer**, principals of Tractor Marine, Inc., on this project," said **Spencer O'Grady**, Marco's shipyard manager of sales and customer service.

Completion and delivery of the vessel is scheduled for the late summer of 1995.

For more information on Marco Seattle
Circle 128 on Reader Service Card



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McDermott Announces New Executive Assignments

Robert E. Howson, chairman of the board and chief executive officer, McDermott International, Inc., has announced a new operating organization for the company.

"The pending conclusion of the merger that will create J. Ray McDermott presents us with the opportunity to realign McDermott's operations along the lines of our major business units," Mr. Howson said. The following assignments are effective immediately:

- **James J. Wildasin** will be named president and chief operating officer, J. Ray McDermott, S.A., a new company which will begin operations upon completion of the merger of McDermott's marine construction business with Offshore Pipelines, Inc. He will report to Mr. Howson in his

position as chairman of the board and CEO of J. Ray McDermott and will remain in London. Shareholders of Offshore Pipelines, Inc. were scheduled to vote on the proposed merger at a meeting on January 30.

- **Joe J. Stewart** is named executive vice president, McDermott International, Inc., and president, Babcock & Wilcox Government Group. He will report to Mr. Howson and will relocate to Lynchburg, Va. Mr. Stewart will be responsible for B&W's work for the U.S. government, the diversification of the company's operations into new government and commercial markets, and McDermott Intl's project management.

- **E.O. (Neal) Hooker** who will continue to report to Mr. Stewart, remains senior vice presi-

dent, Babcock & Wilcox Government Group.

- **Brock A. Hattox** is named executive vice president and remains chief financial officer, McDermott International, Inc., and is named president, Engineering and Industrial Group. He will remain a member of the board of directors. He will report to Mr. Howson and relocate to Houston. Mr. Hattox will continue to be responsible for corporate financial functions, and assumes responsibility for McDermott's onshore engineering businesses, and its proposed projects in the former Soviet Union.

- **Daniel R. Gaubert** who will continue to report to Mr. Hattox, is named vice president, finance. Mr. Gaubert will be responsible for accounting, controller, treasury, and tax functions.

- **Walter E. Boomer** is named executive vice president, McDermott International, Inc., and president, Babcock & Wilcox Power Generation Group. He will report to Mr. Howson and will relocate to Barberton. Mr. Boomer will be responsible for B&W's worldwide fossil power and replacement nuclear steam generator businesses.

- **E. Allen Womack** senior vice president and chief technical officer, assumes additional responsibility for the project management activities of McDermott Shipbuilding, Inc., which includes engineering, design, procurement, and planning. He will continue to report to Mr. Howson.

- **Richard E. Woolbert** is named executive vice president and remains chief administrative officer. He will continue to report to Mr. Howson. Mr. Woolbert assumes additional responsibility for global marketing and for purchasing.

- **Lawrence R. Purtell** senior vice president and general counsel, corporate secretary, assumes additional responsibility for corporate planning and business development. He will continue to report to Mr. Howson.

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Circle 282 on Reader Service Card

ASRY Ship Repair Business Up In 1994

Arab Shipbuilding & Repair Yard (ASRY) reported ship repair revenue was \$66.5 million for 1994, an 18 percent gain over 1993. Operating profit reached \$7 million, and net profit, after depreciation, interest and loan repayment for ASRY's expansion project, was \$150,000.

For more information on ASRY
Circle 127 on Reader Service Card

Senator Kerry Named Ranking Member Of Maritime Subcommittee

Senator **John Kerry** of Massachusetts was named ranking member of the Commerce Committee's new Oceans and Fisheries Subcommittee. The subcommittee was created to replace National Ocean Policy Study.

Brown Bros. Uses Orkot Bearing Material On Superliner

Orkot's TLM/M Marine has been used in more than 20 vessels, the latest being the 100,000-ton superliner being built for P&O's U.S.-based subsidiary Princess Cruises by Fincantieri. For that vessel, Brown Brothers is supplying VM600 stabilizer fins containing Orkot bearings.

Brown Brothers' **Bill McDiarmid** explained there were two main factors why Orkot was chosen for this and other applications. "First, the low swell properties of TLM in sea water, and secondly, the load bearing capacity of the Orkot material was the highest of its type and specific loadings are critical." Brown Bros. have specified Orkot's TL or TLM/M marine bearing composite for the past eight years.

For more information on Orkot
Circle 149 on Reader Service Card

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Circle 30C on Reader Service Card

Kaefer, Westfalia, Sabroe Offer New Pallet-Handling System

Kaefer Isoliertechnik and Westfalia Systemtechnik, both of Germany, and Sabroe Marine of Denmark, created a joint venture — KSW Systems — to market a new pallet handling technology they claim will offer major advantages to the refrigerated cargo handling business. Central to the Automatic Seaborne Pallet Handling (ASPH) system is automatic pallet handling in the holds, using technology developed by Westfalia.

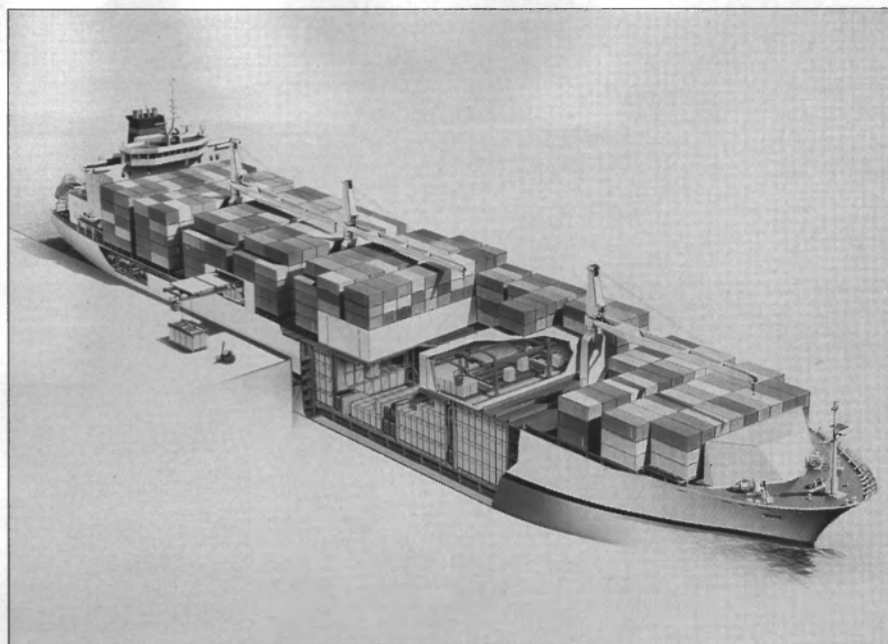
At the SMM 94 Show, KSW demonstrated ASPH as part of a design called Reefer 175 — a double-hulled vessel similar in size to a 1,600-TEU, 21,000-dwt containership. The cargo area divides into nine sections: two container holds with hatches at the bow, six insulated, refrigerated and hatchless holds in the middle, and another container hold with hatches aft.

The weather deck is also designed for container stacking with three

deckhouses that provide cargo access. Each deckhouse contains cooling and ventilation equipment as well as a pallet handling crane and a Westfalia pallet conveyor system. The palletized cargoes are loaded and discharged via side hatches. Container handling can thus be undertaken independently of palletized cargo movements, via three ship-board cranes.

The six reefer holds provide capacity for about 4,770 pallets measuring 3.3 ft. by 3.9 ft. (1 m by 1.2 m), with about 800 pallets per hold. In each hold is an automatic shelving system, with two racks per hold.

The racks are served by a Westfalia stacker crane, with a cargo lift on which is installed a machine Westfalia calls a Satellit — a robot-like device positioned at the top of the aisle by the crane, where it is released to seek either the nearest available bay for storing a particular pallet, or the designated pallet to be



Model of the cargo storage concept developed by the joint venture KSW Systems.

retrieved for unloading. An integrated dimension check, pallet identification and weighing system allows cargo to be positioned in the holds according to ship stability and trim criteria.

The ASPH system allow auto-

matic handling of palletized cargoes, with up to 5,000 pallet loads capable of being handled in a 10-hour period — cutting port costs and making for faster round trips.

For more information on KSW Systems
Circle 75 on Reader Service Card

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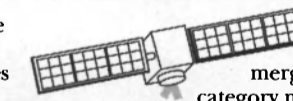


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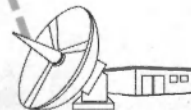
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Maritime Reporter/Engineering News

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Atlantic Dry Dock Wins \$6 Million Contract To Build Hvide Tug

Hvide Marine Inc. signed a contract with Atlantic Dry Dock Corp. of Jacksonville to build a technologically advanced tractor tug designed for the safe escort of tankers and other large ships calling at Port Everglades, according to J. Erik Hvide, chairman and CEO of Hvide Marine. "The new tractor tug will be named the *Broward* and will be a tug on the cutting edge of design," Mr. Hvide said. The \$6 million tug will take seven months to build, and construction has already begun.

Designed by Elliott Bay Design Group of Seattle, the *Broward* will be of all-steel construction and measure 100 ft. (30.5 m) long with a 40-ft. (12.2-m) beam and a 14-ft. (4.3-m) depth, with

a 19-ft. (5.8-m) operation draft.

The vessel will be powered by twin 2,550-hp electromotive diesel engines, each driving an omnidirectional propulsion unit with a four-blade propeller. The circular propeller nozzles will have the capability of turning 360 degrees, allowing the tug to pull at full power from any position. "The design was developed based on technology originally used in Europe and the Far East, but rare in the U.S.," Mr. Hvide said. "The multidirectional pulling ability and maneuverability provides for maximum efficiency, stability and safety in operation."

For more information on Atlantic Dry Dock
Circle 26 on Reader Service Card

For more information on Elliott Bay Design
Circle 27 on Reader Service Card

Broward Particulars

Owner	Hvide Marine Inc.
Builder	Atlantic Dry Dock Corp.
Designer	Elliott Bay Design Group
Main engines	EMD
Propulsion	Aquamaster
Auxiliary power	GM diesels
Auxiliary generators	Marathon
Fire pump	Nijhuis
Deck machinery	Markey

Astilleros Españoles To Build Bulk Carriers For Hong Kong Owner

Astilleros Espanoles has signed a contract with the Hong Kong shipowner Supreme Pearl Ltd. for the construction of a pair of capesize bulk carriers. Designated yard numbers 75 and 76, the 162,800-dwt vessels will be built at the company's Puerto Real yard. They are designed to be 948 ft. (289 m) by 141 ft. (43 m) by 78 ft. (24 m), and deliveries are scheduled for June 1996 and September 1996.

For more information on Astilleros Españoles
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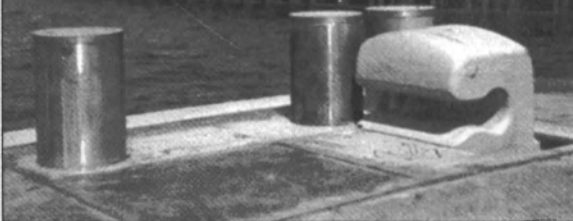
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KHI/AMD Hayabusa Completes Trials



The *Hayabusa*, a 328-ft. (100-m) Kawasaki Heavy Industries (KHI) wave-piercing aluminum catamaran — type Kawasaki Jet Piercer AMD 1500 Mark II and based on a design licensed from Advanced Multi-Hull Designs (AMD), Pymble, Australia — recently engaged in sea trials and achieved a speed of 35.5 knots. Service speed for the *Hayabusa* will be 30 knots at 90 percent MCO.

The vessel was constructed by KHI for Maritime Credit Corporation of Japan in Tokyo, and Kyushi Ferry Boat Co. Ltd., Yawatahama, Ehime Prefecture. It is KHI's first wave-piercing catamaran.

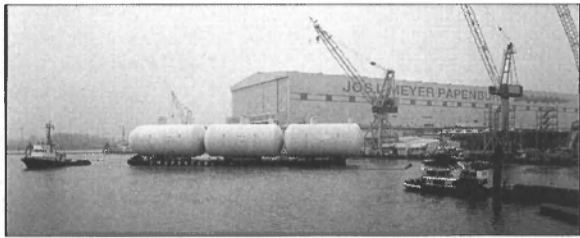
The *Hayabusa's* propulsion consists of two Caterpillar 3616 diesels producing 5,420 kW each and two Caterpillar 3612 diesels, which produce 4,060 kW each, linked to four Kawasaki KPJ169A waterjets.

Hayabusa's maximum deadweight capacity is 570 tons; passenger capacity will be 460, and car capacity will be 94. The vessel will fly the Japanese flag.

For more information on AMD
Circle 85 on Reader Service Card

For more information on KHI
Circle 86 on Reader Service Card

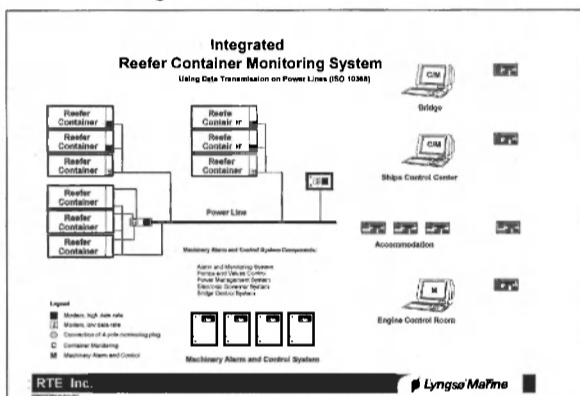
Meyer Tanks For Italian Yard Shipped On Pontoon To Adriatic



In late December, three cargo tanks built at Meyer Werft, Papenburg, were loaded onto the barge *EMS Ponton I*, and set out to the Italian port of Pesaro, to be installed later on a gas tanker being built at Italian shipyard Cantiere Navale di Pesaro. The cargo tanks were ordered by Liquid Gas Equipment Ltd. (LGE) of Edinburgh. Meyer Werft has built more than 250 tanks for their own gas tanker newbuildings and for gas carriers at various European yards.

For more information on Meyer Werft
Circle 54 on Reader Service Card

A New Concept In Reefer Container Monitoring

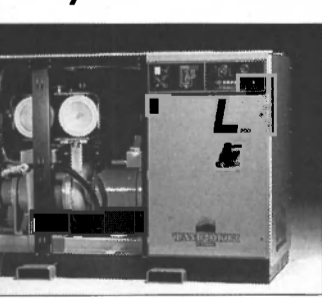


A new total reefer container monitoring system has been developed as a result of cooperative product design and marketing by Lyngsø Marine and Refrigerated Transport Electronics (RTE). The innovation is the combination of both high and low data rate transmissions into one system that will meet the international standard ISO 10368 requirements. The Container Monitoring System type CMS 2100 is capable of interfacing to Carrier, Klinge, Mitsubishi and Thermo King refrigerator units, and can be adapted to any other unit currently on the market.

CMS 2100 features trip data recording, record management, remote alarms, set-point features, and remote pre-trip and maintenance. The system is accessed through a single user control unit, is Windows compatible, and offers bayplan and standard styles. Among the first customers for the system are US shipping line Matson Navigation Company and Kvaerner Marine of Norway.

For more information on Lyngsø Marine
Circle 44 on Reader Service Card

Danyard Picks Tamrotor Compressors



Danyard, the Danish shipbuilder, has placed an order for 14 large Tamrotor screw compressors. Each of the 315 kW L series compressors has a capacity of 43 sq. m./min at 12 bar working pressure. The compressors will be installed in seven

vessels ordered by Stolt Nielsen, two in each. Compressed air is used in the production of nitrogen for safety purposes.

February, 1995

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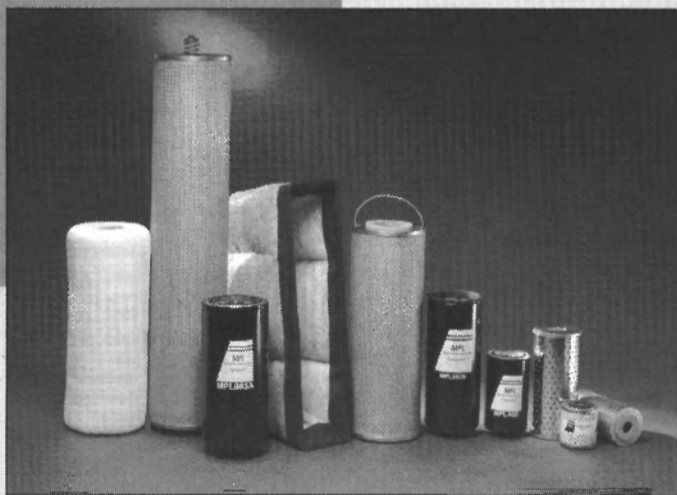
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17

Contship Europe Delivered

The *Contship Europe*, launched on October 15, 1994, was slated to be named and delivered Dec. 30, 1994. Sponsoring the ship was Frau Ursula Brunken, who planned to hand over the ship to Contship Containertransport-und Beteiligungsgesellschaft GmbH & Co.

The ship, built by Germany's Schichau Seebeckwerft AG, is a

modified BV 1600 containership type, with a container capacity of 1,684 of which 618 will be carried under deck and 1,066 above deck.

The main engine is of type BV/ MAN-B&W 7 L 60 MC with a maximum continuous rating of 13,125 kW. Speed is 19.1 knots. The latest IMO rules are considered in its design.

For more information on Schichau Seebeckwerft
Circle 57 on Reader Service Card

Gladding-Hearn Supplies Vessel To Pilots Association


Gladding-Hearn Shipbuilding has been contracted to supply a 63-ft. (19.2-m.) all-aluminum vessel for the Calcasieu Pilots Association in La. The twin-screw vessel, which has an 18-ft. (5.5-m) beam and draws six feet (1.8 m), is powered by two Detroit Diesel engines, each rated

for 815 bhp at 2,100 rpm, driving nickel-bronze propellers via Twin Disc 2:1 reverse/reduction gears. The deep-V, hard-chine hull will have a top speed of 27 knots. Safety features include grabrails inside and out, wide sidedecks and a boarding platform on the cabin roof. The vessel is scheduled for delivery in July.

For more information on Gladding-Hearn
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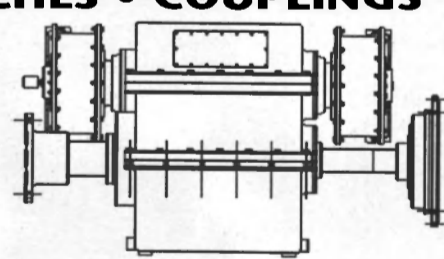
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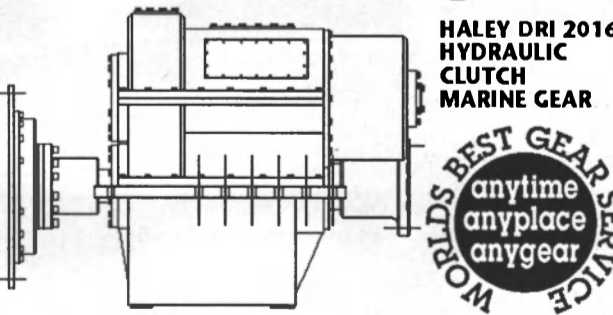
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Owner	Calcasieu Pilots, Inc.
Builder	Gladding-Hearn
Designer	C. Raymond Hunt & Associates
Length	63.25 ft. (19.3 m)
Depth	8.5 ft. (2.6 m)

AlliedSignal Acquires Lycoming From Textron For \$375 Million

AlliedSignal has completed the acquisition of Lycoming Turbine Engine Division from Textron Inc. for \$375 million in cash and the assumption of certain liabilities. Lycoming manufactures turbofan engines for regional airlines, helicopter engines for commercial, military and utility aircraft, military tank engines and marine propulsion engines.

AlliedSignal said its customers would benefit from a significant expansion of global field services, stronger distribution and aftermarket support networks.

For more information on AlliedSignal
Circle 2 on Reader Service Card

Kvaerner Masa Fits Neste Tanker With Statoil's STL System

Neste and Kvaerner Masa-Yards have signed a contract for a new type of bow-loading system to be installed in Neste's 91,000-dwt tanker *M/T Futura*. The new system, patented by Norway's Statoil and known as Submerged Turret Loading (STL), allows oil to be taken directly from a production platform even in rough seas and in Arctic conditions. The system was put into use for the first time at the end of 1994, when the *Futura* participated in transporting oil cargoes from the Harding field in the British waters of the North Sea.

The contract for the installation of the new loading system is worth about \$13.5 million. The conversion will take place at Kvaerner Masa-Yards' Turku New Shipyard. *M/T Futura* will arrive at the yard in early August and will be redelivered at the end of September.

The Submerged Turret Loading system allows the vessel to be hooked up to a submerged loading buoy moored to the seabed. Crude oil is

pumped into the tanker's bottom lines directly from the production platform. No crude oil storage is therefore required at the field. STL has the advantage of enabling loading even in storm conditions. In addition, the dynamic positioning system of the unit maintains the tanker's position to the tolerances required during offshore loading operations, thus enabling loading with the engines on standby. STL will also be used in the Norwegian Heidrun field, scheduled to come on stream this year.

Kvaerner Masa-Yards delivered the 91,000-dwt double hull crude oil/product tanker M/T *Futura* to Neste in 1992. The sistership M/T *Natura*, delivered in 1993, is already equipped with a different type of bow-loading equipment on the forecastle of the vessel, which allows offshore cargo loading.

For more information on
Kvaerner Masa-Yards
Circle 100 on Reader Service Card

MarAd News

Applications Received

Gulfcoast Transit Company Seeks MarAd OK: The Maritime Administration (MarAd) has received an application from Gulfcoast Transit Company renewing its earlier request for temporary written consent under section 506 of the Merchant Marine Act, 1936, as amended, to transfer the *Janis Guzzle* to the domestic coastwise trade for not more than six months during a 12-month period. The vessel was built with the aid of construction differential subsidy. The application has been assigned Docket S-905, and scheduled to be published in the *Federal Register*.

Applications Approved

Louisiana Materials Gets OK To Transfer Deck Barge Registry: Louisiana Materials Co., Inc., New Orleans, La., has received approval from the Maritime Administration to sell the deck barge *TMI 96* to McKeil Work Boats, Limited, a Canadian corporation. The 4,540-gt vessel was built in 1942 in Chester, Pa., and will be transferred to Canadian registry.

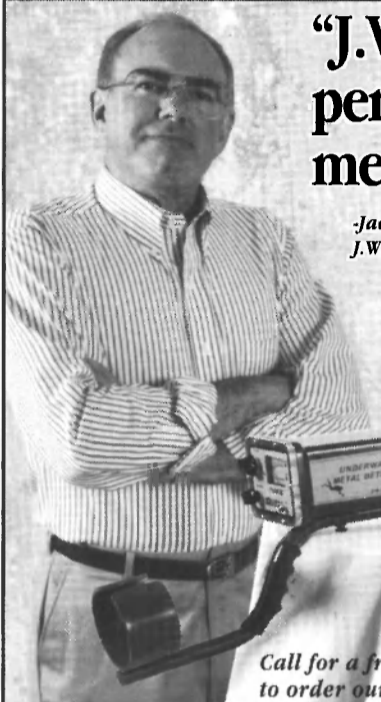
August Trading Asks Permission To Sell Sea Trader I To Italian Buyer: MarAd has received an application from August Trading, Inc., Cedar Rapids, Iowa, to sell the 34,401-dwt barge *Sea Trader I*. The proposed purchaser is Somocar S.p.A. of Italy. The barge was built in 1971 in Akitsu, Japan. If approved, the barge would be transferred to Italian registry and used for trading between Italian coastal ports and ports in the Adriatic and Mediterranean Seas.

Cenac Towing Seeks To Sell Two Tank Barges: MarAd has received an application from Cenac Towing Company, Inc., Houma, La., asking permission to sell two tank barges, the *CTCO 2303*, and *CTCO 2304*. The proposed purchaser is T.J.T. Service Co., Ltd., of Bangkok, Thailand. The barges were built in 1968 in Harvey, La. MarAd's permission is required under section 9 of the Shipping Act, 1916, as amended.

USCG Publishes Final Rule On Drug Testing

The USCG published a final rule that requires all merchant mariners applying for new or renewed licenses, certificates of registry or other credentials to be tested for illegal drug use, whether or not a physical examination is required. However, physicals are not required for certain types of document transactions, i.e., when certificates of reg-

istry are issued for physicians, nurses and pursers and when documents are issued for entry-level ratings. Merchant mariners will still be exempt from periodic testing if they are covered by a random drug testing program or can show negative test results from a USCG-mandated drug test conducted within the previous six months.








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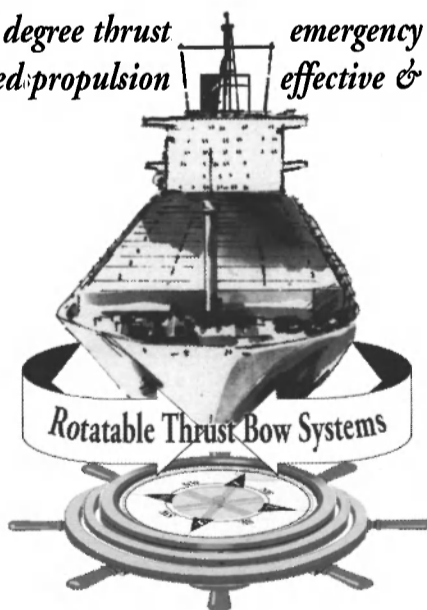
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RECENT SHIP SALES

This report, compiled by Shipping Intelligence, Inc., a New York maritime consulting firm, tracks sale prices of secondhand bulk carriers and tankers.

Date	Vessel Name	Type	DWT	Year Built	Sale Price (millions)
1/9/95	Bosporus	Bulker	17,000	75	\$2.8
1/9/95	Astir	Bulker	22,669	74	\$2.75
12/19/94	Sunny Napier	Bulker	23,442	78	\$4.5
1/9/95	Hyundai No. 14	Bulker	25,025	82	\$8
1/9/95	Hyundai No. 15	Bulker	25,073	82	\$7.8
1/9/95	Hyundai No. 11	Bulker	25,232	80	\$7
1/9/95	Hyundai No. 12	Bulker	25,502	80	\$6.1
1/9/95	Pacific Gracia	Bulker	26,025	78	\$4.5
12/19/94	Sinem Uzundemir	Bulker	26,350	81	\$8.7
1/9/95	Stamar	Bulker	27,047	77	\$5.5
1/9/95	Fen	Bulker	27,048	72	\$2
1/9/95	Charalambos B	Bulker	27,071	72	\$2.9
1/9/95	Afros	Bulker	32,472	70	\$2
1/9/95	Manila Sunrise	Bulker	33,024	85	\$12.8
1/9/95	Marine Glory	Bulker	35,000	82	\$10.75
1/9/95	Pacific Serenity	Bulker	36,170	82	\$11.8
1/9/95	Hyundai 16	Bulker	37,227	82	\$11.75
1/9/95	Constantinople	Bulker	38,407	77	\$7.5
1/9/95	Rubin U	Bulker	40,800	86	\$17.1
1/9/95	Intrepid	Bulker	41,000	84	\$14.55
1/9/95	Cassia	Bulker	42,294	85	\$17.1
1/9/95	Star Barbara	Bulker	43,556	89	\$21
1/9/95	Copilco	Bulker	43,665	89	\$20.8
12/19/94	Sea Luck	Bulker	53,351	75	\$4.5
12/19/94	Samari	Bulker	58,412	81	\$10.5
12/19/94	Fairwind Venture	Bulker	60,192	81	\$9.95
12/19/94	Gordon Setter	Bulker	89,127	82	\$10.2
12/19/94	Finesse L	Tanker	39,334	75	\$7.5
12/19/94	Nissos Paros	Tanker	87,076	75	\$3.7
1/9/95	Shoko Maru	Tanker	87,366	76	\$5.2

For further information, contact: Shipping Intelligence, Inc., 25 West 43rd St., New York, N.Y. 10036, tel: (212) 997-0966.

Pacific Basin Bulk Shipping Limited Buys Four Ships

Pacific Basin Bulk Shipping Limited has acquired four secondhand handysize dry bulk carriers. This brings the total number of such ships acquired since its initial public offering in late September 1994 to 14, including the six ships which the company agreed to acquire in the early part of 1994. The company now has 23 handysize dry bulk carriers with total tonnage of 583,106 dwt. The four vessels, purchased at a cost of \$40 million, were built between 1983 and 1986. All four vessels are due to be delivered this month. The company is also negotiating for the sale of a number

of the older ships in the fleet. Executive Chairman **Chris Buttery** commented: "We believe that we now have the largest modern fleet of handysize vessels operating in the Asia/Pacific region. Assembling a fleet of handysize ships of the right design, quality and age within the time frame we had set ourselves places us in a very strong position to provide our charterers with the vessels they require to benefit from this strengthening freight market. The delivery of the bulk carriers which we are having built in China will consolidate our position as one of the leading handysize operators in this region. Charter rates in our sector have continued to improve over recent months and this will be reflected in our results for the six months to 31st December 1994."

17 Million DWT Scrapped In 1994

According to the International Association of Independent Tanker Owners (Intertanko), the tanker fleet has been reduced by approximately six million dwt, or two percent, in 1994, due to the overall scrapping of about 17 million dwt. The bulk of the reduction concentrates on tankers above 100,000 dwt. Pakistan led all nations in scrapping in 1994, disposing of 4.8 million dwt, of which only one was below 200,000 dwt.

The average age for all tankers scrapped was 23 years, compared to an average age of the whole existing tanker fleet of 13 years, a gradual decline since the first part of 1992 when it was 13.4 years.

Scrapping 1994 (1993 figures in brackets)

Country	No. of tankers	'000 dwt	Average age	No. of VLCCs
Pakistan	21 (14)	4,764 (1,616)	23 (24)	18 (4)
India	56 (41)	4,326 (1,879)	25 (26)	8 (1)
Bangladesh	13 (18)	4,289 (1,557)	22 (23)	9 (3)
China	13 (43)	1,841 (6,531)	22 (20)	4 (18)
Other countries	15 (5)*	1,745 (947)	21 (27)	3 (1)
TOTAL	132 (131)	16,966 (12,531)	24 (23)	42 (27)

* Some pending destination

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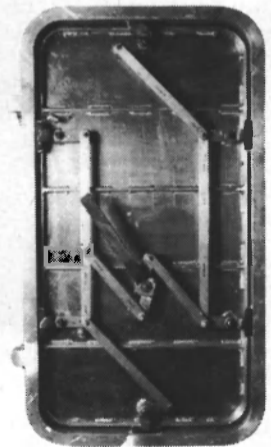
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Circle 252 on Reader Service Card

Bazan's objective secured with new order

By Carol Fulford & Andy Smith, contributing editors

Spanish builder Empresa Nacional Bazan is certainly on course to accomplish its objective to "provide the necessary means to succeed" in the fast ferry market despite its history as a warship builder. Good signs include the recent introduction of a 315-ft. (96.2-m) monohull fast ferry — the 37-knot *Albayzin* (As originally reported in the January 1995 issue of *Maritime Reporter & Engineering*

News, page 22), on New Zealand's Cook Strait route; two identical vessels under construction for a local route; and an order just received from a Uruguayan operator to build an enlarged 40-knot version.

Converting from naval to commercial production, a dilemma facing many shipyards around the world, is undoubtedly difficult, but fortunately Bazan's apparently successful approach has been well docu-

mented.

Successfully completing such a transition involves consideration of vessel type, construction techniques, production systems, etc. — all utilizing accumulated skill and knowledge. It is significant to note, however, how much attention must be committed to customer relations, as noted in a recent paper by **Fermin Horrillo**, planning manager and **Jesus Arce**, production manager.

Dealing with a commercial operator requires a heightened sensitivity to price, where costs (including running costs) become a major consideration in the decision making process.

The Bazan team, however, went even further back to basics in fine tuning its new philosophy, insisting that the potential customer should trust that the shipyard is making a strategic decision to move into a market rather than taking advantage of a given moment in order to win a specific contract. Customer confidence, it suggests, is further enhanced by a clear understanding of operational requirements and difficulties as well as the technological aspects of the vessel. Although most owners think they would like a tailor-made vessel, Bazan believes that while the superstructure, accommodation, catering facilities and duty-free shop layout are essentially a customer decision, the hull and propulsion system should be as close as possible to a proven design. It contends that a standard vessel has improved sale or chartering prospects and will more easily attract financial backing.

Although it is predictable that Bazan would eventually opt for a monohull design of fast ferry, utilizing its frigate experience, the company did analyze all options, finally admitting that there is no absolute truth — except that the material should be aluminum for reasons of weight saving. If a chosen route is in a protected area where seakeeping is not relevant, Bazan concedes that a catamaran with its lower fuel consumption/power requirement would be a more suitable choice. The larger surface area of the catamaran may also be important to an owner. However, if there

Noteworthy

Irish Celebrate: With Irish fishermen happier than most about the outcome of the recent EU fisheries negotiations in Brussels, mainly concerning the access of Spanish boats, the small Irish port of Killybegs celebrated the arrival from a Norwegian yard of the biggest fishing vessel in the entire British Isles and the placing of orders for two more vessels.

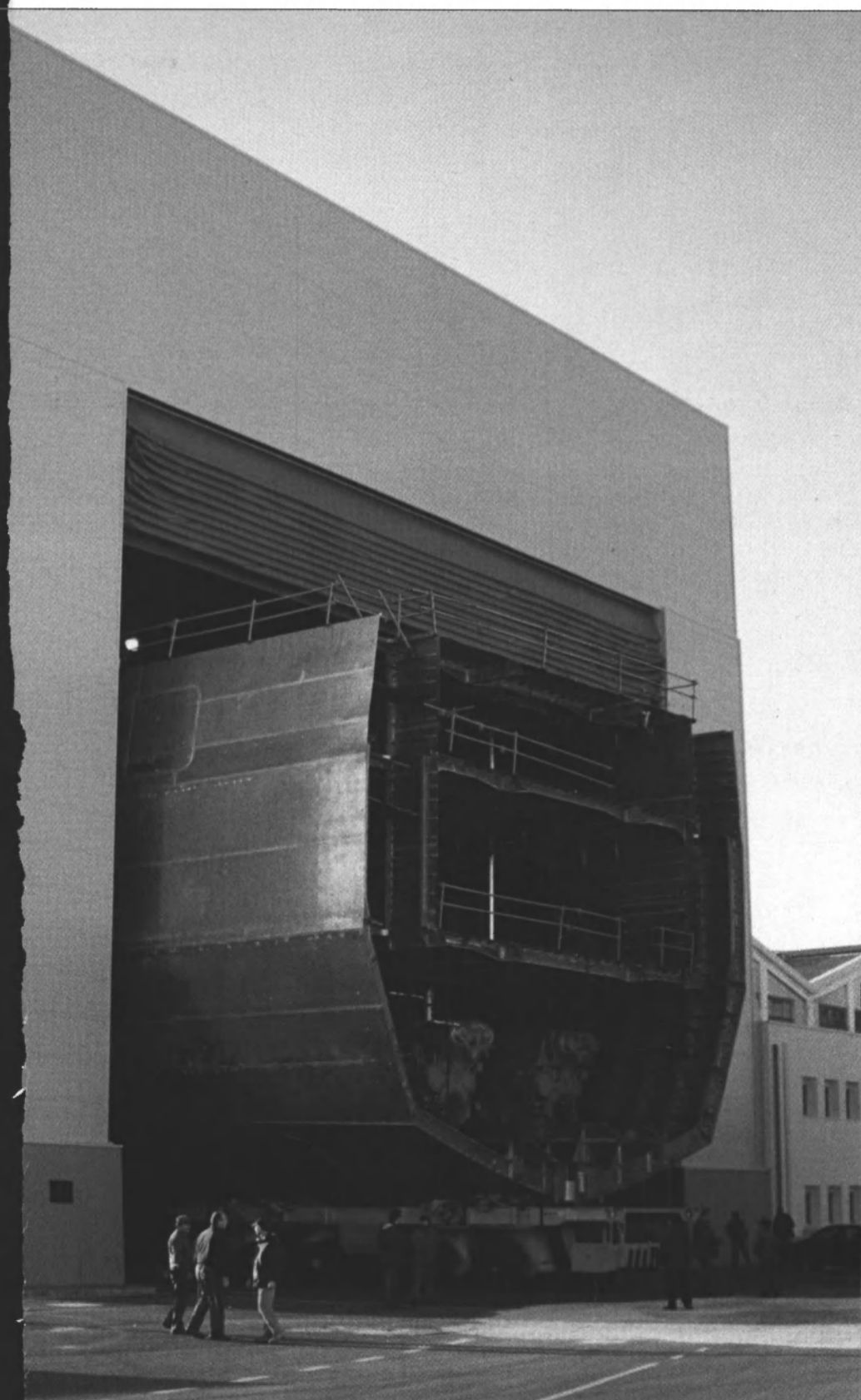
The 348-ft. (106-m) *Veronica* made an eventful maiden voyage from the Thomas Hellesoy yard on the west coast of Norway to County Donegal in 80 mph headwinds, at times reducing the vessel's progress down from 17 to 4 knots, according to skipper Kevin McHough although, in the conditions, he was most impressed with the vessel's performance and handling. *Veronica* must be the most highly specified of any fishing vessel in Ireland, or the U.K. as a whole, and incorporates a 7,840-hp Wartsila main engine and accommodation for 44 crew. Of more conventional size for European waters are the two identical 151-ft. x 36-ft. (46-m x 11-m) pelagic trawlers ordered from Flekkefjord, another Norwegian yard, by two Killybegs-based pair trawling partners.

Scots Persevere: News from one of Scotland's premier fishing boat yards would indicate that the region's fishermen are determined to persevere. Macduff Shipyard Ltd. reports a full orderbook — relying on an reputation among local skippers. Delivery of *Fertile*, a 60-ft. (18.3-m) steel twin-rig trawler, has helped the yard make room for the fitting-out of two 90-ft. (27.4-m) steel hulls built in northern England to Macduff designs. Three 68-ft. (20.7-m) wooden trawlers are on schedule to be commissioned around the middle of the year and work is proceeding on an 85-ft. (26-m) steel vessel built entirely at the yard. "All these vessels are for Scottish fishermen and we also have a steady throughput of local repair and conversion work," said Technical Director Bill Farquhar. Designed for fishing prawns and whitefish, *Fertile* is of traditional layout from the builder's in-house design team and derives its propulsive power from a 440-hp Caterpillar 3412 marine diesel turning a 1,850 mm Heimdal CP propeller inside a Kort nozzle. Electrical power is from a pair of 44-kW Ford-based generating sets. In common with most modern U.K. fishing boats, it has a high electronics/navigation specification — on this occasion featuring top of the range equipment by Koden, Furuno, Navitron, Veripos, Sailor, Racal and Simrad. The Macduff yard remains fiercely independent, having erected an additional large building hall some five years ago. "Without any outside assistance," asserts Mr. Farquhar proudly.

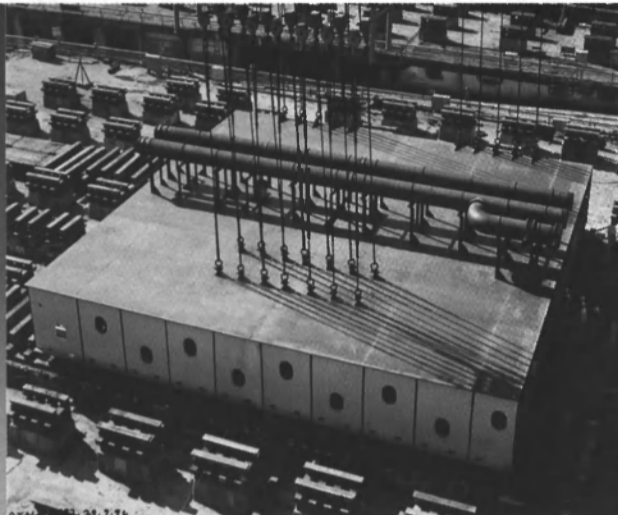
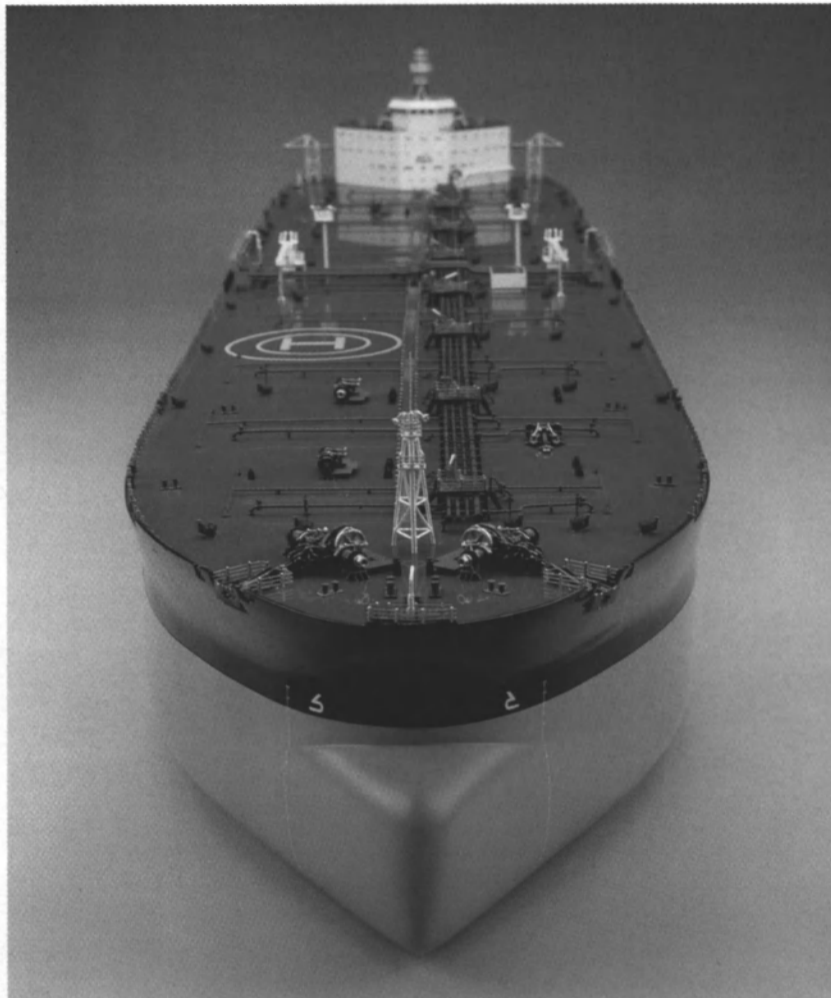
is a possibility that the vessel could be moved at a later date to another, less protected route, a monohull with better seakeeping, simpler maintenance and greater flexibility should be chosen. But it is no secret that Bazan intends backing both horses by developing a multi-hull fast ferry.

To build the 315-ft. *Mestral* vessels, a building strategy was developed involving the division of the craft into 10 complete transversal sections. The work performed in each was carefully planned so that

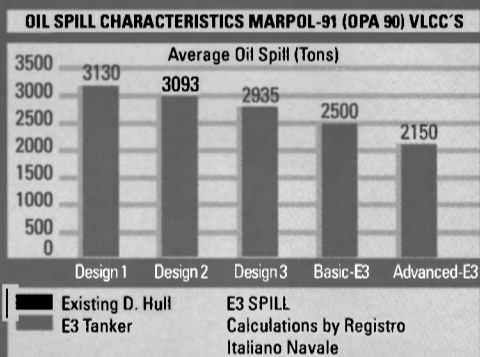
(Continued on page 25)



Europe has recognized it at Lillehammer



The first building block of the E3 Tanker



The E3 Tanker programme was recently honoured at Lillehammer by the Eureka Interministerial Conference,

representing 23 European Countries. Indeed, it was selected as one of the three most industrially advanced and environmentally friendly Eureka projects of the year. Thousands of people working at five of Europe's leading shipyards feel proud of this privilege.

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Circle 207 on Reader Service Card

EUROPEAN UPDATE

(Continued from page 23)

priorities could be established at the outset. A PERT program was used as a planning tool, developing the necessary software to provide the interfaces for the different databases used in the budgeting, purchasing, engineering and production departments with automatic update and feedback provision.

According to Mr. **Horrillo** and Mr. **Arce**, the CAD-CAM system is a fundamental element in the building strategy. Among its main advantages are accurate dimensional information, cutting, shaping, marking and positioning detail, piping and wiring information and establishing work packages within the integrated construction philosophy.

New machinery considered imperative for the company's San Fernando yard located near Cadiz on Spain's southwest coast (Bazan has two other yards) included an underwater plasma cutting machine with two pools capable of handling a pair of plates 32 ft. x 6.5 ft. (9.75 m x 2 m) each and a seam welder with the ability to weld plates 32 ft. long into panels 32 ft. square. Information from the CAD system is transmitted directly to the new cutting machine through a fiber optic cable. To improve the layout and make best use of existing facilities, the covered working area has also been increased by building two new shops with a total surface area of over 6,000 sq. m., one of which has twin traveling cranes with a total lifting capacity of 100 tons.

Production begins with the reception and storage of plates and profiles in one of the new shops, from where they pass to the adjacent fabrication building for cutting and shaping. Once the elements which form a block have been prepared, work proceeds in the assembly shop until ready for fitting into the appropriate section in the second of the newbuildings. Finally the sections are moved to the building berths where they are joined together. Here outfitting continues until launching.

Both hull and superstructure of the Mestral are in welded aluminum, with the bottom sides and decks longitudinally stiffened and specially reinforced chines. The bridge deck is rigidly connected to the hull girder so that the stiffness of the vessel is high and stresses kept within allowable fatigue values without weight compromise. The area beneath the car deck is divided by seven watertight bulkheads into five void spaces, two engine spaces and one waterjet room. Four Caterpillar 3616 diesels each developing 5,400 kW drive KaMeWa waterjets through Voith reduction gearboxes.

The first two Mestrals were originally ordered by local operator Trasmediterranea and designed for service on the Barcelona-Mallorca/

Ibiza route carrying up to 450 passengers and 76 cars a distance of over 100 nautical miles at 35 knots. Vessel number one was launched in July 1994, but in October — without having gone into service — was simply repainted in the livery of Sea Shuttle, a New Zealand subsidiary

of Buquebus, an operator based in Uruguay who now owns the vessel. Trasmediterranea has agreed to transfer its order to *Mestrals 2* and *3*, taking delivery of the first in May 1995, in time for the busy summer season. Meanwhile, Buquebus has ordered a larger version, although

little detail is known except that it will be able to carry 1,250 passengers and 250 cars at 40 knots and use six conventional diesel engines, almost certainly from Caterpillar, as the two companies are involved in a joint venture to produce a lighter more powerful version of the 3616.

Marine Travelift model 100 BFM at Rolly's Marine in Ft. Lauderdale, FL.

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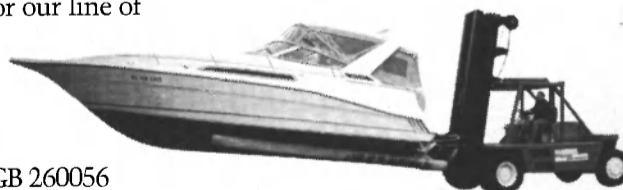
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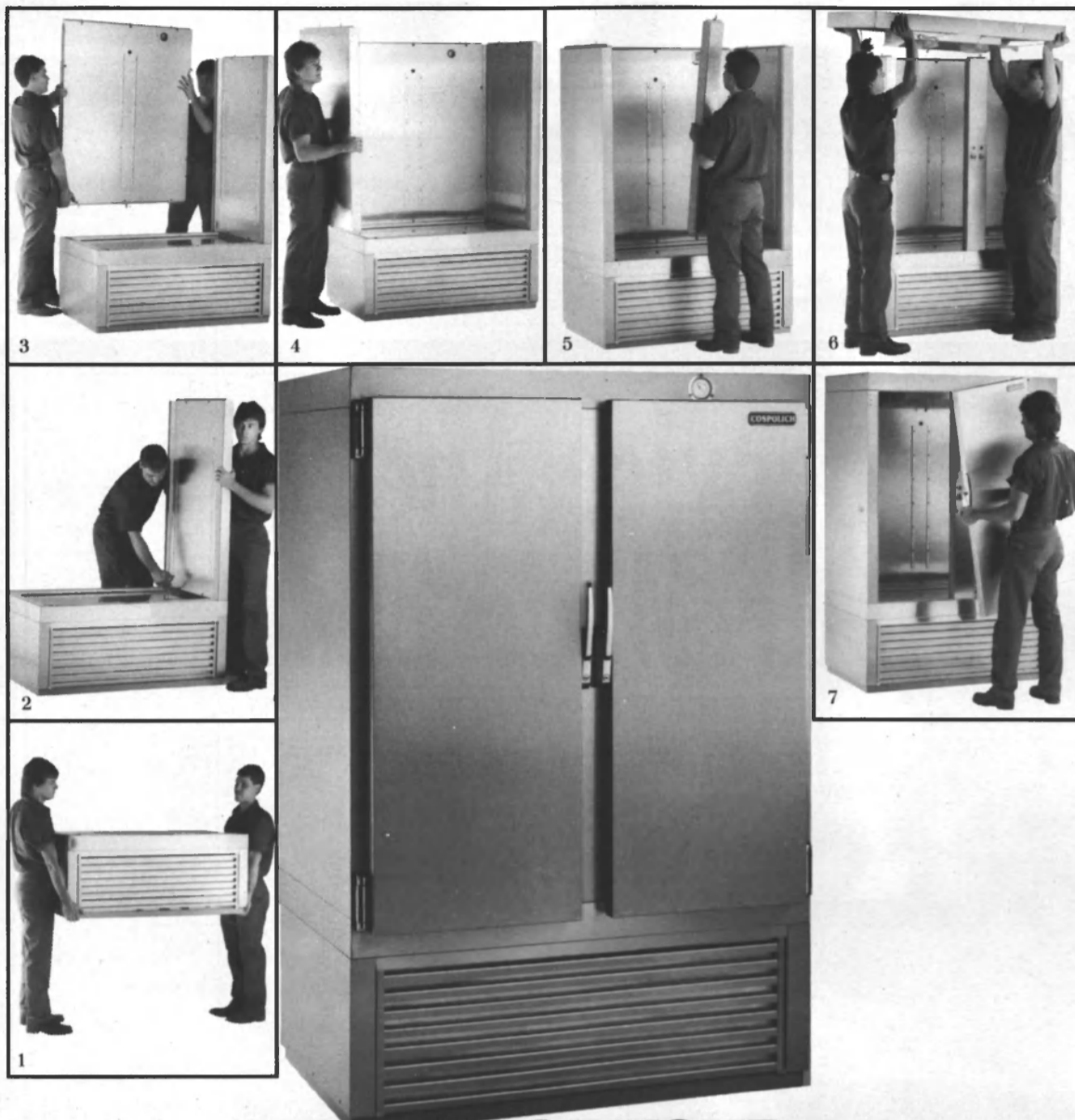
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Circle 288 on Reader Service Card

Hull building by numbers

By Carol Fulford & Andy Smith, contributing editors

Steel-Kit Ltd., a U.K. company, developed a system of advanced ship construction claimed to minimize build time, reduce skilled labor requirements and allow considerable cost savings. Two Irish yards are the latest to receive kits of accurately cut steel. A 36-ft. (11-m) multipurpose fishing boat based on a design developed by naval architect **Denis Swire** is being constructed, and a 60-ft. (18.3-m) mussel farm boat forms the other new Steel-Kit application.

The system's development is another aspect of the growing need of smaller yards to specialize to remain competitive. Many European yards faced with an increasingly international marketplace have restricted activities to a particular facet of construction. Steel-Kit has concentrated on designing and manufacturing steel and aluminum hulls in kit form. This brings the latest construction techniques and greater choice to smaller yards without the need for major investment. It also allows yards to build one-off designs.

Steel-Kit's system originates with a computer analysis of the required hull and its optimization for the construction process. The vessel is built and re-built, possibly several times, on the computer to ensure that construction will go smoothly and predictably. Standard working drawings can be translated into a project requiring only semi-skilled labor. Using the latest profile cutting equipment, a complete package of steel or aluminum is produced ready for assembly and welding. Each component is easily identifiable and will only fit in the correct way, and the edges of each section are shaped ready for welding. Each piece is clearly numbered in the order in which it will be required.

Other vessels built with the system include two 98-ft. (30-m) catamaran ferries, several fishing vessels, aluminum hull rigid inflatable boats, a 45-ft. (13.7-m) motor yacht based on the famous Nelson pilot/patrol boat design, a 50-ft. (15.2-m) sports fishing cruiser and a 142-ft. (43.3-m) x 40-ft. (12.2-m) floating fire station moored on the River Thames. Cost analysis on the fishing boats and catamarans indicated significant savings.

Don Fuller-Love, managing director of Steel-Kit, said the system evolved over 20 years. "I wanted a system in the yard that did not need constant supervision. Now I see it as the way ahead for smaller yards although there are no real size limits in its application," he added.

Several respected U.K. marine industry personalities appear convinced. **Barry Carson** of Carson Marine, a major builder of rigid inflatables, has adopted the Steel-Kit system. Traditionally the company formed all rigid hulls in fiberglass, and will continue to use this material. But in three recent projects, pre-cut kits in aluminum were used. "Aluminum hulls give us more flexibility in adapting designs to specific requirements," said Mr. Carson. "We selected the Steel-Kit system using aluminum because it produces a very accurate hull and allows complete weight control, essential when a contract demands specific performance characteristics."

The involvement of naval architect **Arthur Mursell** is also of significance. Through his company TT Boat Designs, Mr. Mursell is the zealous guardian of the Nelson name. Those that know the history will appreciate that his consent to these designs being converted into the Steel-Kit system is itself a high seal of approval.

Steel-Kit may also be a way to build fishing and workboats in developing countries. By purchasing pre-cut kits, third world yards can gain access to a high level of technology without the need for extensive training.

For more information on Steel Kit
Circle 79 on Reader Service Card

Avondale Expands Boat Division's Marketing Department

In accordance with Avondale's goal to secure new commercial shipbuilding contracts, the Boat Division has expanded its sales staff. Boat Division Vice President **Barry Heaps** and Sales Manager **Ronald Babin** announced the appointment of **Jerry Buras**, **Mike O'Leary** and **Chris Kelly** to the expanded team.

Mr. **Buras** brings 47 years of experience to the department. Mr. **O'Leary**, with 20 years of experience in operations and sales of marine vessels, will concentrate on sales of vessels to the inland marine industry. Mr. **Kelly** brings seven years of marine-related experience with owners and operators along the Gulf Coast, and will concentrate on the offshore markets.

The Avondale Boat Division specializes in the design and construction of all types of watercraft up to 400 ft. (123 m) in length. Avondale Industries, Inc. is involved in modular construction of plants and components for a variety of land-based industries, as well as building and repairing ships and boats to Navy and commercial standards.

For more information on Avondale
Circle 41 on Reader Service Card



Detroit Diesel Completes Acquisition Of European Diesel Manufacturer

Detroit Diesel Corporation completed its acquisition of VM Motori S.p.A., Cento, Italy, from a group led by Montagu Private Equity. Detroit Diesel paid \$125 million for the business.

VM Motori designs and manufactures diesel engines for a variety of automotive and industrial applications in the 25 to 220 hp range, and is an independent supplier of diesel engines to the automotive industry worldwide.

According to **Roger S. Penske**, Detroit Diesel Corporation chairman and CEO, "Detroit Diesel Corporation's expertise in heavy-duty engine electronics and alternative fuel technology and VM's capabilities for the design and manufacture of small light-duty engines should enhance the capabilities and depth of engineering skills in both organizations. VM Motori and Detroit Diesel will share from their individual strengths in research and development and technology."

For more information on
Detroit Diesel Corporation
Circle 43 on Reader Service Card

Pride Of Maui Upgraded

Naval architects at Art Anderson Associates in Bremerton, Wash. designed a deck extension for the Maalaea-based excursion boat *Pride of Maui*. The boat operates snorkel/dive cruises from Maalaea to Molokini and Turtle Town, with seasonal whale watching expeditions.

The upper deck has been extended about 10 feet (3 m), increas-

ing sun space upstairs and shady space in the main cabin. Naval architect **Greg Hughes** designed the deckhouse extension, which broke down into modules to fit within a standard shipping container for shipment from the mainland to the islands. Art Anderson Associates is an engineering consulting firm specializing in the needs of the maritime industry.

For more information on
Art Anderson Associates
Circle 60 on the Reader Service Card

Hitec Wins \$250 Million Contract

Philips Petroleum Norway has awarded Hitec a contract for engineering, procurement and manufacturing of a new drilling rig package to the 2/4X platform, which is part of the Ekofisk II development. The total contract is \$250 million.

The work on the drilling module will be carried out in Stavanger until commissioning in April 1996. The steel will be manufactured in Edmonton, Canada, and transported to Stavanger for outfitting in January 1996.

For more information on Hitec
Circle 45 on Reader Service Card

IACS Council Announces Major New Ship Safety Measures

Major initiatives for improved safety of bulk carriers and RoRo vessels were key developments announced from the December council meeting of the International Association of Classification Societies (IACS).

The IACS has begun a definitive investigation into the safety of bulk carriers; this project will build on

data being assembled in IACS' Enhanced Survey Program for bulk carriers, launched in mid-1993.

The Council also reviewed plans for the work of a special IACS committee which is conducting a full re-examination of passenger RoRo vessel safety following the *Estonia* tragedy. The IACS Council also confirmed that the association's unified interpretations and guidelines for training and qualification for assessors to begin certifying conformance to IMO's new International Safety Management (ISM) code are targeted for completion during March 1995. Regarded as one of the most significant steps forward in ship safety for at least a decade, the ISM code will improve compliance with international rules and regulations and support safe practices in ship operations. IACS has been a major player in shaping and refining IMO code provisions.

Southwest Marine Awarded \$12.4 Million Contract

In late 1994, Southwest Marine (SWM) was awarded a \$12.4 million contract for work on the USS *Boxer* (LHD-4). The entire work package will be performed in three separate activities. Fitting Out Availability (FOA) begins this month, and will correct any problems created during the initial building process. Restricted Availability (RAV) begins in October, and will include normal maintenance and repairs. The purpose of the third activity, Post Shakedown Availability (PSA), is to correct, repair and maintain all systems, including hull, mechanical and electrical. This availability begins in February of 1996, and completes in April 1996.

For more information on
Southwest Marine
Circle 47 on Reader Service Card

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Circle 323 on Reader Service Card

Leica Wins Contract For First DGPS Beacon System in China

The Chinese Maritime Safety Administration has awarded a contract to the Leica navigation and positioning division for a differential GPS beacon system at Qinhuangdao.

The Leica DGPS beacon system

will provide positioning accuracies of 16.4 ft. (5 m) or better throughout the Bohai Sea and parts of the northern Yellow Sea.

The DGPS beacon site consists of a Leica MX 9112 12-channel DGPS reference station, which monitors and measures errors in GPS satellite signals.

Correction factors are transmitted to ships and boats through a marine radiobeacon transmitter, in the internationally accepted RTCM

SC-104 format.

The Qinhuangdao installation marks the beginning of a five-year plan to establish up to 12 beacon sites providing overlapping coverage over all Chinese coastal waters. The Chinese system will be fully compatible with DGPS beacon systems in other countries meeting the International Association of Lighthouse Authorities (IALA) standard.

For more information on Leica
Circle 46 on Reader Service Card

Keppel Completes \$10 Million Cattle Carrier

Keppel Shipyard, an operating division of Keppel Corporation Limited, has successfully converted *Friesian Express*, a refrigerated cargo vessel, to a cattle carrier.

Awarded by Vroon BV Livestock Express Inc. of The Netherlands, the contract is worth \$10 million. The 3,335-dwt vessel is now equipped to transport about 1,780 heads of cattle.

Significant work carried out by Keppel Shipyards included the fabrication and installation of various decks and deckhouses, steel platings and other fittings for the cattle enclosures, involving 364 tons of steel. Among equipment installed were a bowthruster, a deck washing system and an automatic drinking system for the cattle, an extensive ventilation system, new cranes and a fresh water generator with the capacity of about 40 tons of fresh water daily.

For more information on Keppel
Circle 48 on Reader Service Card

USCG Approves Changes To Vessel Response Plans Citing AMC OPA 90 Coverage

A major international shipping firm has received confirmation from the U.S. Coast Guard that changes to its vessel response plans, citing the OSRO/Marine Response Services provided by the American Marine Corporation (AMC), fully satisfy the response resource requirements of the Oil Pollution Act of 1990.

This removes vessel response plan approval as an issue of concern to the many shipowners/operators otherwise poised to take advantage of the company's rates.

AMC provides response plan holders a full set of geographic specific appendices covering each port in its area of operations, as well as detailed resource lists and port by port cascading schedules, demonstrating its Tier I, II and III response capability.

For more information on
American Marine Corporation
Circle 49 on Reader Service Card

Moran Purchases Oceangoing Tug/Barge Unit

Moran Transportation Company announced it has purchased an oceangoing tug and a 93,000-barrel oceangoing petroleum tank barge. The 4,200-hp tug has been named *Valentine Moran* and the barge, *Pennsylvania*.

Moran now operates 54 tugs and 17 barges along the Atlantic and Gulf coasts, and will be pursuing additional opportunities in marine transportation.

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Circle 292 on Reader Service Card

Maritime Reporter/Engineering News

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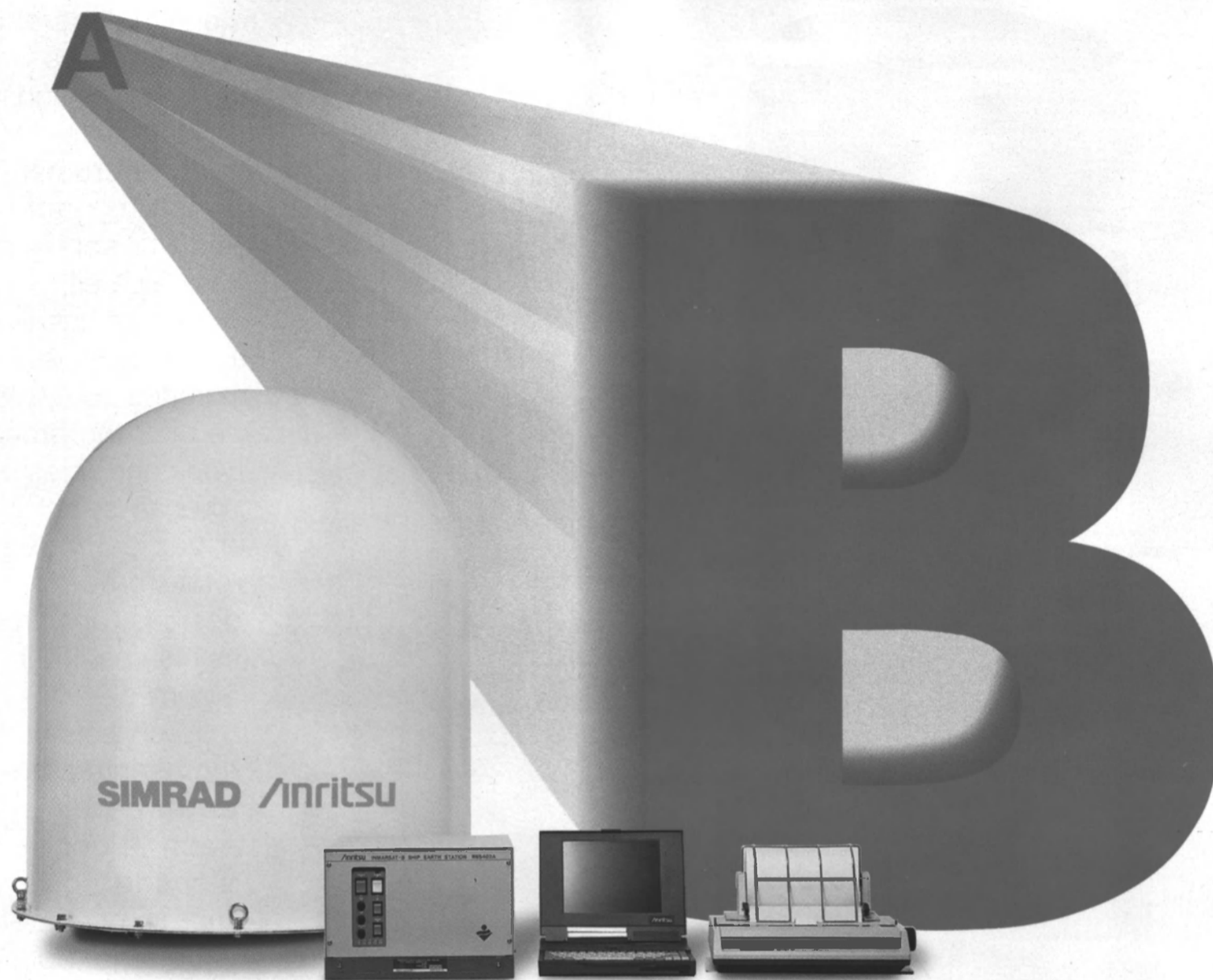
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Circle 25* on Reader Service Card

Atlas Simulator For Cadiz University

STN Atlas Elektronik's Bremen-based simulation division, in association with Page Iberica SA, has been awarded a contract for design and delivery of a ship-handling simulator to the Nautical Training Center of Cadiz University. The first simulator of its type to be commissioned in Spain, it is due for installation this spring and will be used for training of ships' masters, pilots and students as well as for research applications.

The system comprises a complete replica of a ship's bridge equipped with a full range of advanced VHF communications and navigation facilities, including an Atlas 9800 ARPA and 9600 TM radar. The bridge area itself consists of a series of main control and navigation consoles, together with a steering stand. Up to six ships of differing types can be generated via computer scenarios.

The Cadiz order is the second ship-handling simulator contract to have been secured by STN Atlas Elektronik over recent months, following one for upgrading of Hamburg Technical College's Nautical Faculty "SUSAN" system. Similar Atlas-designed nautical simulators are also operational in Australia and Taiwan.

For more information on
STN Atlas

Circle 50 on Reader Service Card

Electronic Charting Gets A Boost Through New Alliance

C-MAP, the multi-national chart supplier, and Nautical Data International, Inc. (NDI), the private-sector chart production and distribution partner of Canadian Hydrographic Service, have joined forces in a strategic alliance to satisfy the growing demand for high quality digital charts for electronic navigation systems.

This alliance encompasses all aspects of the market: production and distribution of electronic charts, cooperation with hydrographic offices, sharing of technology and standardization of electronic chart usage.

As part of the agreement, C-MAP has acquired an equity position in NDI. The Canadian Hydrographic Service has fully supported this agreement and has reaffirmed its partnership with NDI. The new directors of NDI are Fosco Bianchetti of C-MAP/Italy and Brian Terry of NDI.

For more information on
C-MAP

Circle 51 on Reader Service Card

Inmarsat And Gulf States Sign Memorandum of Understanding

The Cooperation Council for the Arab states of the Gulf (GCC) and Inmarsat, the international mobile satellite organization, have signed

an agreement to collaborate on joint interests.

Key areas of future cooperation include the newly-formed Inmarsat affiliate company, a \$2.6 billion venture which will launch the global mobile satellite handheld telephone, called Inmarsat-P, in 1999. Inmarsat and GCC hope to establish a collective Middle Eastern representation of investors for the UK-

based affiliate.

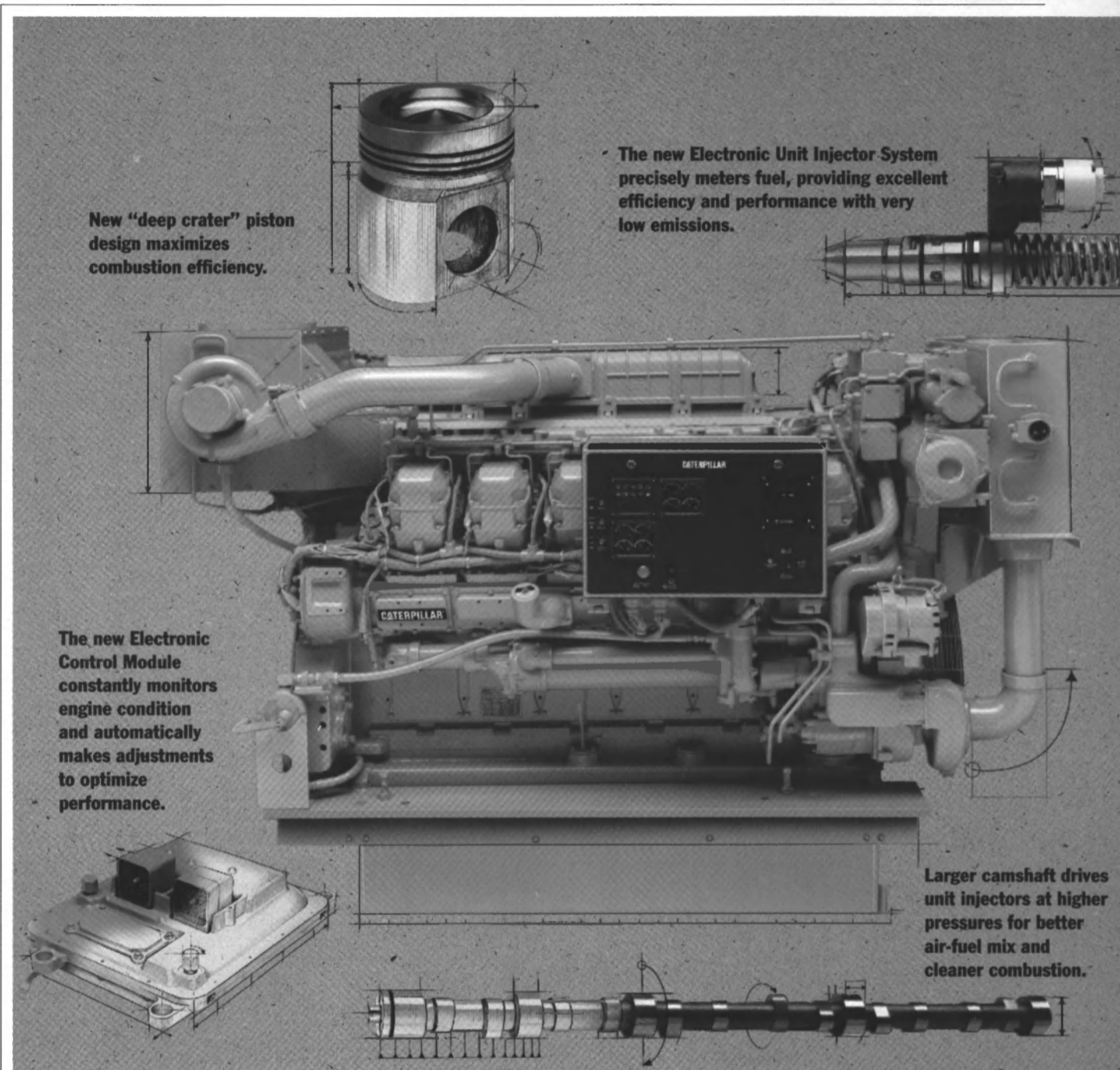
Inmarsat and GCC will also collaborate on special projects involving mobile satellite applications in the maritime, aeronautical and land mobile environments. These efforts include the organization of a Global Maritime Distress and Safety System (GMDSS) seminar to discuss the system with merchant and government vessels and fishing fleets.

COMING IN MARCH...

Maritime Reporter & Engineering News will feature the

CASINO BOAT QUARTERLY:

In-depth market report with a focus on the builders and suppliers driving the market.



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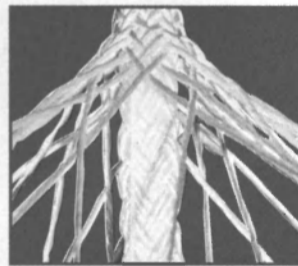
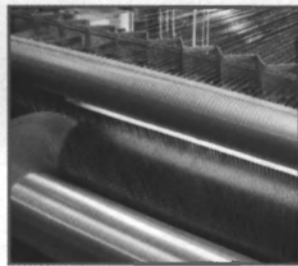
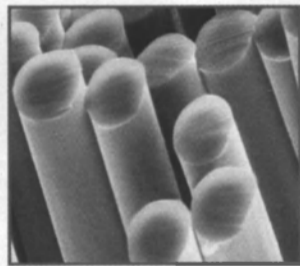
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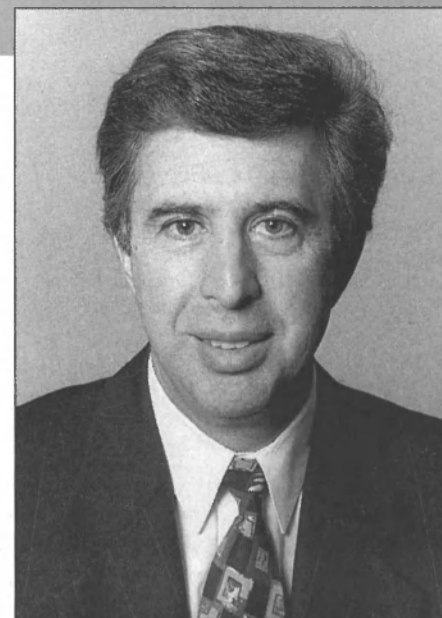
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FINANCIAL UPDATE

Financing Will Be Critical To Health Of Changing, Growing Maritime Industry

By Stephen Z. Serepca, senior vice president
The CIT Group/Capital Equipment Financing



Stephen Z. Serepca

Financing will be one of the most critical issues facing the global maritime industry over the next 10 years, as the need for shipping increases, industry consolidation continues, and equipment ages and, in some cases, becomes obsolete.

Financing this growth will be a challenge. Despite the fact that banks are making a comeback to the industry, business finance companies will be increasingly active in financing the shipping industry's growth. However, these companies will need to continue developing ways to meet the large and complex financing needs facing the maritime industry, resulting in some new and innovative financing structures.

Shipping Opportunities Increase

Most of the world's industrial nations are emerging from recession and the newly industrializing nations of Asia are experiencing explosive Gross Domestic Product growth — in some cases achieving double digit annual rates. The world's bulk and liner service trades are already beginning to benefit from the improving world economy that is increasingly becoming more integrated and interdependent. Mass geopolitical movements toward market economies are further strength-

ening shipping growth.

Worldwide environmental concerns are also having an impact. For example, the need for refined hydrocarbon products out of the Middle East by the ecology-conscious U.S. and Europe will result in increased shipping activity. And, as more money is devoted to aiding needy nations, additional grain movements will further increase shipping demands.

Also fueling shipping growth is the rebuilding of the infrastructure of Eastern Europe and the CIS, and China's massive ongoing economic development program.

Consolidation in the Industry

The growth in the world economy coupled with heightened global competition will also result in capital and maritime market dynamics forcing consolidations and mergers of fragmented and undercapitalized shipping companies over the next five years. After this wave of consolidation, performance and access to capital will rise to new levels for shipping firms, similar to the experience of recent activities in the Greek sector and in the liner service trades.

An Aging Fleet

Although orders for new ships in the bulk sector slowed in 1992 and

1993, they were on the rise in 1994, and we expect that they will continue to rise through the end of the century. However, the world bulk fleet is aging and scrapping activity is on the rise.

Currently, approximately half of the world bulk fleet is older than 15 years, and almost two-thirds — 64 percent — of tankers are older than 20 years. And, tougher environmental standards being imposed by classification societies are making many vessels unusable. As a result, scrappings are at near-term record levels — 18 million dwt in 1993, with similar scrappings expected for 1994.

Of concern to the industry is that despite the fact that prices of vessels are down 10 to 15 percent from two years ago, charter rates do not support the cost of building new tonnage. Today, newbuildings are still about 50 percent more expensive than they were in the mid-1980s, with a new VLCC now costing approximately \$82 million versus \$55 million in the mid-1980s. For example, it currently costs approximately \$27 million to build a panamax bulker versus \$18 million in the mid-1980s. Also, shipbuilding capacity has been reduced by about 40 percent since the late 1970s with delivery lead time for new vessels running approximately 18 months.

The combination of these factors will result in a short-term tightening in the supply of vessels needed to accommodate the expansion in the worldwide movements of basic commodities. As a result, demand for tankers and bulkers will increase through the latter part of the 1990s.

The hundreds of billions of dollars that will be needed to replace and expand the aging world fleet of ships is not confined to the bulk sector of the maritime market. There are a dozen major sectors in the industry, each with different dynamics and needs. (Please see chart, left).

Capital Markets

In 1993, the industry saw a resurgence of available capital from public debt and equity sources with over \$3 billion (\$2 billion in debt primarily placed in the U.S., and \$1 billion in equity largely placed in Norway) flowing to shipping. In 1994, a resurgence in traditional financing occurred as banks worldwide have returned to the industry and as public debt and equity offer-

ings slowed. In 1993, 89 banks were actively involved in ship financing, up from 67 in 1992. And, we expect that this figure increased to approximately 100 banks in 1994.

However, the role of banks in financing the maritime industry will be limited by the fact that some banks have pre-set asset limitations and pre-set deal size and structure restrictions. Traditionally, non-bank business finance companies are able to lend to these companies and are likely to play a larger role in financing the industry's growth over the next decade.

Innovative Financing

The term "innovative financing" refers to tailoring each element of a deal structure to accommodate the critical constraints of the borrower. Innovative financings provide the opportunity to create hybrids of different financial arrangements, including applying the most desirable features of leases to loans. Each element of deal structure is a candidate for lease type treatment.

When CIT/Capital Equipment Financing is discussing financing options with a shipping company, the first consideration is whether the financing should be structured as a lease or a loan. Here, the term lease refers to a passive, financially-oriented lease rather than active operating chartering, which is the province of active owner/operators. Although leasing is not pervasive in the industry because ownership and unwinding entanglements impair flexibility, leasing is an attractive option for owners in sectors with long-term use for vessels and for those who provide services to cargo interests.

Lease transactions can take a few forms. One form is the *true lease*, where the risks and rewards of ownership reside with the lessor. Other forms are *off-balance sheet financing* and *finance leases*, where in both cases, the lessor is only a nominal owner. Leases can be leveraged or single-investor structures. In general, they provide a high level financing versus asset values, are

DETERMINING THE MARKET

CIT/Capital Equipment Financing carefully follows all 12 major sectors in maritime and eight in intermodal — this encompasses 23,750 ships and 19,500 U.S. inland waterway barges, and more than eight million TEU intermodal containers, not just the approximately 8,000-vessel world bulk fleet of more than 10,000 dwt extensively reported by researchers. For maritime, these sectors are:

Type	Number of Vessels
Bulkers	5,450
Tankers	5,400
Chemical Tankers	1,100
Containerships	2,000
Car Carriers	300
Cruise/Passenger Ships	250
Offshore and Coastal Vessels	5,300
Forest Products	300
Reefer Ships	1,050
Gas Carriers	300
RoRo Tweendeckers/ Multipurpose Vessels	2,300
TOTAL	23,750

FINANCIAL UPDATE

long-term commitments, and can involve complex, optimized repayment schedules, tax benefit transfers and residual risks and rewards.

Loans, on the other hand, are ubiquitous in the industry and offer maximum flexibility for the bor-

rower.

Loans can be designed to incorporate the following features:

- Advance rates can approach those of a lease;
- Term can be almost as long as the asset's remaining useful life;

• Repayment structures can be customized and optimized;

• Loans can be partial or even fully non-recourse to borrowers with recourse to charterers;

• Balloons can be partial or even fully non-recourse to borrowers;

- Rates can be fixed or floating;
- Substitution of asset flexibility can be provided for sales of pledged vessels in lieu of prepayment, thus avoiding break-funding costs; and
- Back-end joint ventures can be structured involving shared recourse on aggressive residuals and upside residual sharing.

The degree to which financing can be innovatively structured is a function of:

- The size and substance of the borrower or recourse charterer in relation to the size of the financing;
- The quality and historical performance of the owner/operator;
- The quality and projected market values of the collateral vessels; and
- The characteristics of the market and the borrower's ability to generate adequate cash flow to comfortably service debt.

Innovative financing generally requires lending to a consolidated, audited business enterprise as lenders are somewhat investing in, rather than special-purpose lending to, an owner.

Financing the Growth of the Industry

Non-bank involvement in financing the maritime industry will continue well into the next century. Business finance companies like CIT/Capital Equipment Financing, with an in-depth knowledge of the industry, its needs and its realities, are well-positioned to provide the customized financing needed by the maritime industry.

The CIT Group/Capital Equipment Financing is an operating unit of The CIT Group and has extensive experience financing industries ranging from maritime and intermodal shipping, air transportation and rail, to mining, energy, healthcare and high technology. CIT/CEF has been providing financing to the maritime industry for more than 30 years. Last year, the Company provided \$5 billion in new loan and lease capital to domestic and international businesses. Approximately one-third of that capital funded transportation equipment asset-based transactions, with more than \$200 million having been used for financing maritime and intermodal assets — ship and marine containers. Founded in 1908, The CIT Group, Inc. is a \$15 billion asset-based lender. Mr. Serepca has 25 years of experience in the industry.

For more information on CIT
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Circle 313 on Reader Service Card

Trinity Marine Growth Prompts Executive Changes

Senior vice presidents **Vincent R. Almerico** and **Daniel J. Mortimer** of the Trinity Marine Group have received new responsibilities as a result of continuing growth and new opportunities. Mr. **Almerico** will serve as senior vice president of development, his responsibilities including joint ventures, foreign co-production, new acquisitions and involvement in U.S. government contracts. Mr. **Mortimer** will take over Mr. **Almerico's** responsibilities for Trinity's nine open "blue water" shipyards.

Seattle Firm To Analyze International Cruise Ferry Service In Mexico

The Maritime Group, Inc. of Seattle, Wash. was selected by Calizas Industriales del Carmen, S.A. de C.V. (Calica) of Mexico City to assist in the development of international cruise ferry service and operations from the new marine terminal at Port of Punta, Vendo, Mexico. The port, located on the Yucatan Peninsula approximately five miles south of Playa del Carmen, and only 11 miles across the Cozumel Channel from Cozumel Island, has a safe deep water berth. Bulk ships of 60,000 gt presently use the port for the shipment of limestone aggregate.

The Maritime Group, Inc. is a consultancy for the research and development of new cruise, ferry and port projects, and is also involved in developing a project for an Inside Passage cruise ferry route between Seattle and Victoria, British Columbia.

For more information on The Maritime Group, Inc. Circle 32 on Reader Service Card

Texaco Announces New Alliance and Investment

In late December of 1993, Texaco signed an agreement with Swedish marine company, Stena, creating a strategic alliance to coordinate Texaco's international marine transportation requirements. This alliance is to be completed in the first quarter of 1995.

Stena will assume the management of all vessels comprising Texaco's international fleet. A 50-50 joint company, Stentex, has also been formed to administer Texaco's barrels of annual international crude and product movement requirements. Commenting on the alliance, Texaco Inc. Senior Vice President **C. Robert Black** said, "This alliance enables Texaco to continue to have access to cost competitive marine transportation that ac-

commodates our needs, while maintaining the company's commitment to high safety and environmental standards."

Also in late 1993, Texaco announced its acquisition of a 30 percent interest in Nigeria's Oil Prospecting Licenses 213, 217 and 218 from Statoil and British Petroleum. This agreement commits Texaco to spend approximately \$80 million over the next five years for exploration activities.

Statoil and BP will each hold a 35 percent interest after the Nigerian government formally approves the assignment.

Texaco's alliance with Stena and investment in Nigerian oil are part of the company's worldwide growth plan to improve its competitiveness and profitability.

For more information on Texaco Circle 33 on Reader Service Card

New West Coast Marine Crane Company Formed

Former steel company executive **Hal Uppal** and an investor group have acquired the assets of Seattle Crane and Equipment Co., and will operate the business through a newly formed company, North American Crane & Equipment Company, L.L.C. Mr. **Uppal** said that Seattle Crane's good reputation and quality production were stifled by financial constraints. North American Crane & Equipment will continue to design, manufacture and service marine cranes, as well as sell and rent truck mounted cranes and refuse, sewer cleaning and inspection equipment. North American Crane & Equipment will be located in Milton, Wash. with Mr. **Uppal** serving as managing direc-

tor, and **Ed Higuera**, also an investor and former steel industry executive, as director of operations.

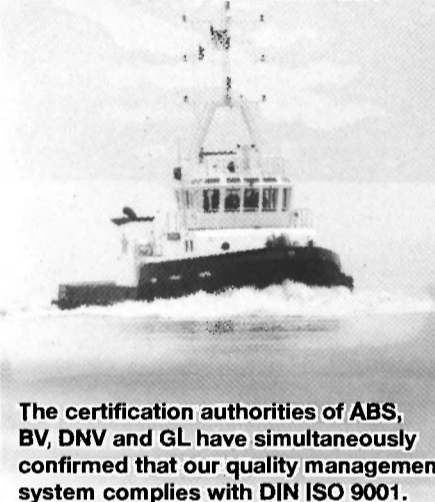
For more information on North American Crane & Equipment Circle 35 on Reader Service Card

Chris-Marine Appoints Cronham As Manager

Chris-Marine West Coast has appointed **Lennart E. W. Cronham** as operations manager for its new diesel engine repair and sales office in the Tacoma-Seattle area. Chris-Marine designs and manufactures diesel engine maintenance equipment. The Tacoma-Seattle office performs regular diesel engine service as well as emergency repairs.

For more information on Chris-Marine Circle 34 on Reader Service Card

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Sperry Marine Opens Canadian Office

Sperry Marine opened Sperry Marine Canada Limited in late December 1994, as announced by **J. Nolasco DaCunha**, sales and services vice president. **Ford M. Beaton** has been named manager, Canadian sales, and will be responsible for all Sperry activities in cen-

tral and eastern Canada. **Don Barnes** will be on the technical staff stationed in Halifax, and **Kai Chow** and **Tony Moniz** will be on the technical staff in Vancouver.

The Mobil Shipping and Transportation Co. has selected a Sperry Marine Integrated Bridge for its second double-hull two million gallon supertanker, modeled after Mobil's 1,089 ft. (332 m) long VLCC *Eagle*. The new vessel will be con-

structed by Japan's Sumitomo Heavy Industries, as was the *Eagle*.

For more information on Sperry Marine
Circle 36 on Reader Service Card.

Forest Lines Inc. Announces Appointments

Forest Lines Inc. has announced the appointment of two executives to

managerial positions in its New Orleans office. **Joseph E. Zehner**, a veteran shipping executive, serving most recently as an agency representative for Forest Lines, has been named traffic manager. **Mikeal F. Hansen**, an executive with the company's ship managing firm in Singapore prior to joining Forest Lines, has been appointed pricing manager.

A subsidiary of International Shipholding Corporation, Forest Lines operates a biweekly trans-Atlantic LASH liner service between U.S. Gulf, inland river and South Atlantic ports, and ports in the U.K. and north Europe.

Harris Fire Appoints New Fire Protection Manager

Harris Fire Protection Co., has appointed **David L. Cieslak** to the position of national marketing manager for fire protection equipment. Mr. Cieslak will be responsible for marketing of fire suppression/inerting fixed systems and smoke/fire/gas detection systems.

For more information on Harris Fire Protection Co.
Circle 37 on Reader Service Card

Frank Gates Announces Maritime Workers' Compensation Company

The Frank Gates Service Company, a third party administrator since 1946, announced in late 1994 the formation of Frank Gates Acclaim, Inc. to administer and investigate maritime workers' compensation and liability claims filed under the U.S. Longshore and Harbor Workers' Compensation Act and the Jones Act.

Frank Gates Acclaim, Inc. was formed through the acquisition of Acclaim Risk Management, Inc., a California firm specializing in maritime related workers' compensation services. The new company will provide third party administration, investigation, audit and consulting services to help reduce costs arising from workers' compensation claims. Simultaneously with the formation of the new company, the opening of a New York City area office was announced, which will serve the ports on the Eastern Seaboard.

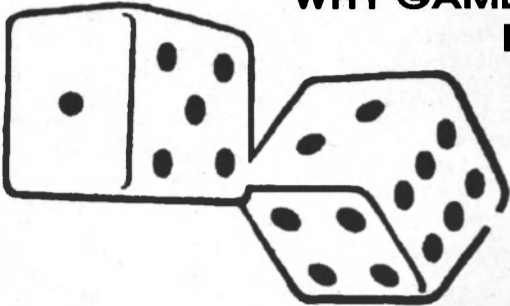
MTU And DDC Form Network

Motoren-und-Turbinen-Union Friedrichshafen GmbH (MTU) and Detroit Diesel Corporation (DDC) entered into three wide-ranging agreements in the fall of 1994, in effect setting up a worldwide network of sales and support for their respective products.

The agreements focused on distribution cooperation between the two companies, as well as the development and production of two new series of diesel engines, the Series 2000 and Series 4000. As of 1995, DDC will be MTU's master distribu-

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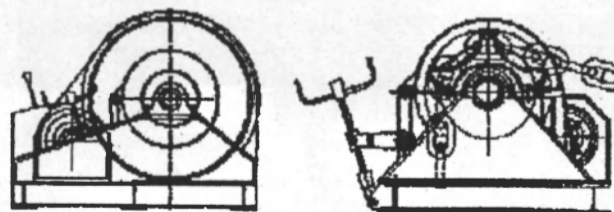
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tor for the U.S. and western Canada, having purchased the latter's assets and integrated the people of MTU North America into the DDC organization.

The rationale behind the MTU/DDC agreements is to make it possible to bring world-class engines rapidly to market and support them with a worldwide network.

For more information on MTU
Circle 38 on Reader Service Card

For more information on DDC
Circle 39 on Reader Service Card

New Head of ABB Turbochargers

Daniel Arnet has been appointed new president of ABB Turbo Systems Ltd., Baden, Switzerland. He will also head ABB's worldwide turbocharger business. Mr. **Arnet** succeeds **Andreas Steiner**, who was promoted to head ABB's utility steam power plants.

Mr. **Arnet** is succeeded by **Peter Spengler**, who will serve as vice president R&D. **Jürgen W. Hackmann** was promoted to senior vice president and deputy of Mr. **Arnet**.

For more information on
ABB Turbochargers
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Astilleros De Santander Announces Department Reorganization

Roger A. Burnison has stepped down as the manager of the Technical and Commercial Department of Astilleros De Santander, S.A. Mr. **Burnison** will re-direct his energies towards his U.K.-based company, Burnison Engineering plc, which has been retained on a consultation basis by Astilleros De Santander.

The departure of Mr. **Burnison** has led to reorganization at Astilleros De Santander, with **Luis de Celis**, sales and ship repair; **Rafael Gutierrez**, estimating and invoicing; and **Pablo Izu**, ship conversions, as new department heads.

For more information on
Astilleros De Santander, S.A.
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Marine Pollution Control Appoints Safety Director

Chester W. Machnowski, Sr., an experienced executive in safety, health and workers' compensation programs, has been appointed

February, 1995

safety director by Marine Pollution Control (MPC). Mr. **Machnowski** was manager of safety and health at AlliedSignal-Bendix Corp.

MPC has participated in cleaning up some of the world's largest oil and hazardous material spills, including the *Valdez* and the Persian Gulf.

For more information on
Marine Pollution Control
Circle 84 on Reader Service Card

ISC Announces Changes In Its Executive Staff

International Shipholding Corporation (ISC) has announced changes in its executive staff upon the retirement of **Dennis F. Hannan**, senior vice president. ISC Vice President **Erik L. Johnsen** has assumed responsibility for all operations of the company's 28-ves-

sel fleet. He also continues to head up ISC's Ship Management Group.

Ronald R. Rose, senior vice president of the ISC subsidiary Waterman Steamship Corporation, will be responsible for operations of all chartered vessels; and he continues to be responsible for Military Prepositioned Ship (MPS) operations.

W. Michael Cameron has been named a vice president of ISC subsidiary LASH Marine Services with

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responsibility for all technical, ship personnel and procurement functions.

Grace J. Russell, formerly manager, Material Department for Boeing Computer Support Services, has joined ISC as director of procurement.

Stephen A. Fraser, formerly of Andersen Consultants before joining ISC in 1994, has been appointed director of information systems.

Seaclear Industries Inc. Expands Dealer Network

Seaclear Industries, Inc. announced in late 1994 the addition of the following companies to its dealer network: Diamond Seaglaze of Vancouver, Canada; Hamilton Marine of Searsport, Maine; Holland Nautic of Apledoom,

Holland; IMP Group of Yarmouth, Canada; Roy's Glass of Seattle, Wash.; and VER of Akranes, Iceland.

Germanischer Lloyd Makes New Appointment to Executive Board

Professor Dr. **Eike Lehmann** is to become a member of the executive board of Germanischer Lloyd in July 1995. Dr. **Lehmann** will succeed Professor **Gerhard Gutschow**, who has been a member of the executive board since 1985. The appointment was approved at the meeting of the supervisory board in December 1994, under the chairmanship of **Walter Behrmann**.

For more information on Germanischer Lloyd
Circle 61 on Reader Service Card

IMC Names Richard J. Patton To Senior Staff Surveyor Post

International Marine Consultants, Inc. announced the appointment of **Richard J. Patton** to the position of senior staff surveyor. A licensed mariner and highly qualified dry cargo and project surveyor, Mr. **Patton** brings almost 20 years of experience, both at sea and ashore, to the post.

IMC is a complete marine technical and engineering resource for ship owners and operators, oil companies, ship yards, marine insurance and legal firms, and government agencies.

For more information on IMC
Circle 42 on Reader Service Card

The Falk Corporation Names Doerr Vice President of Sales and Marketing



Dave L. Doerr

Dave L. Doerr has been appointed vice president of sales and marketing for The Falk Corporation, as announced by **Thomas L. Misiak**, president. Mr. **Doerr** previously served as vice president of operations.

David L. George will join **Terry L. Ball** as co-director of sales reporting to Mr. **Doerr**.

The Falk Corporation is a manufacturer of industrial power transmission machinery, including standard and custom gear drives, flexible shaft couplings, backstops, and fluid power drives and couplings.

For more information on
The Falk Corporation
Circle 62 on the Reader Service Card



David L. George

Vessel Information Services And Industrial Integrators Unify

Vessel Information Systems, Inc. (VIS) has joined forces with Industrial Integrators, Inc. (II) to form a new company called International Integrated Systems, Inc. VIS is known for its innovative marine monitoring and alarm systems. Industrial Integrators deals in marine shipboard automation solutions, remote control and custom marine electrical distribution panels. Together the companies plan to continue offering these systems through a worldwide network.

Currently, International Integrated Systems, Inc. has projects in Holland at Feadship, in Germany at Lurssen Yachts and Abeking & Rasmussen, in England at Devonport Management Ltd., in the U.S. at SWATH Ocean, Nichols Brothers Boat Builders, Campbell Shipyard and Derektor Shipyards.

For more information on
International Integrated Systems Inc.
Circle 63 on Reader Service Card

Drew And Mar-Tec Marine Combine Resources To Expand Business

Mar-Tec Marine GmbH has been acquired by Ashland Chemical-Drew Marine Division, U.S. The acquisition provides the basis for the companies to develop areas of mutual interest and accelerate key market and technological initiatives. Drew Marine, a subsidiary of Ashland Chemical and manufacturer and distributor of specialty chemicals and plastics, has projects in marine water treatment and fuel management

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Circle 33 on Reader Service Card

and chemical maintenance products and systems. Mar-Tec Marine provides shipboard testing and sampling systems for fuels and lubes, blending equipment for fuel oil and ultrasonic cleaning devices for marine use.

For information on Drew Marine
Circle 64 on Reader Service Card

Bohlmann Promoted To Executive Post At Kerr Norton Marine



Robert T. Bohlmann has been promoted to senior vice president of Kerr Norton Marine, the bulkship division of Norton Lilly International (NLI). Mr. Bohl-

mann joined Norton Lilly in 1972, establishing and managing the Norton Lilly Pacific Northwest office. Kerr Norton Marine, a specialized unit of NLI, was formed as a result of the acquisition of Kerr Steamship Company by NLI.

The Sealaw Group To Provide Legal And Consulting Services

Laurie A. Frost and Elizabeth S. Bouchard have announced the formation of a new law and consulting company, The Sealaw Group, L.C., which will specialize in maritime and environmental regulatory compliance. The new company plans to offer its services to vessel and facility owners and operators, cleanup contractors, and others who need to be aware of the federal, state and international regulations.

Ms. **Frost** is an attorney who practiced maritime and environmental law for over a decade with LeBoeuf, Lamb, Greene & MacRae, representing domestic and international clients before Congress, state legislatures, federal and state agencies, and in the courts. Ms. **Bouchard** most recently held the position of director of vessel operations and maritime initiatives for the Transportation Institute. She has served as a liaison between industry and state and federal government, and has experience in evaluating the impact of federal and state legislation and on vessel operations.

The Sealaw Group plans to offer its services at a fixed levels.

For information on The Sealaw Group
Circle 65 on Reader Service Card

Miller Improves Spectrum Plasma Cutting Line

Miller Electric Mfg. Co. has introduced the new Spectrum @ 1000,

Spectrum @ 1250 and Spectrum Plus air plasma cutting systems which reportedly offer improved cutting capabilities, greater durability and enhanced ease-of-use. These machines are designed for heavy-duty industrial manual and automated applications, and cut any material that conducts electricity.

The Spectrum 1000 is a 70 amp, 100 percent duty cycle system with a maximum cutting capacity of 1 in.

on mild steel or stainless steel, and .75 in. on aluminum. The Spectrum 1250 is a 100 amp, 80 percent duty cycle plasma cutting system with a maximum cutting capacity of 1.25 in. on mild and stainless steel, and 1 in. on aluminum.

Both systems feature air plasma gouging capabilities, reportedly producing less smoke and noise than carbon arc gouging, and eliminating carbon inclusions. Spectrum

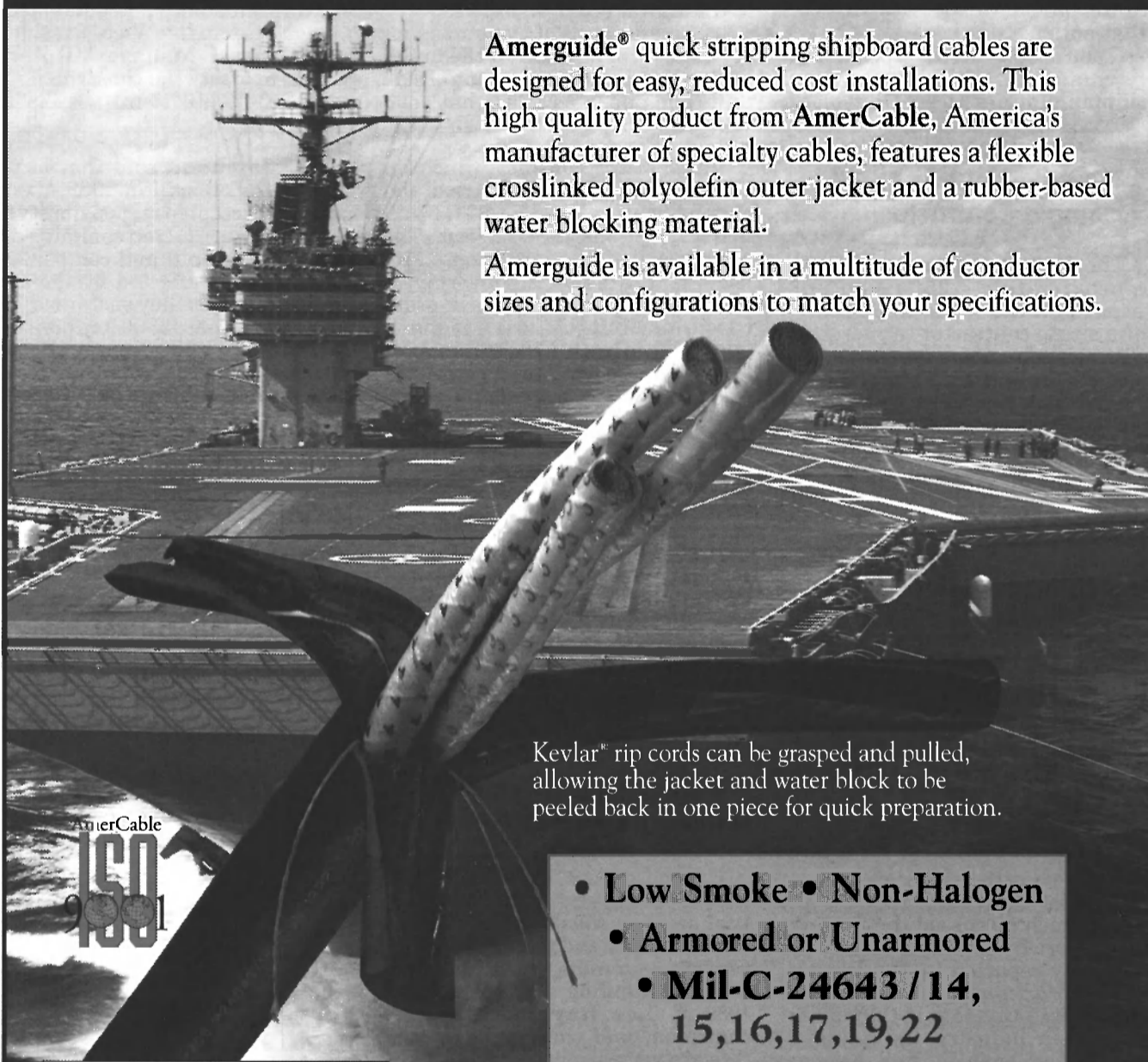
Plus is a completely portable machine, weighing 68 lbs., capable of running off of any welding power source that can provide at least 300 amps of three-phase DC/CC power.

Miller is a manufacturer of arc welding equipment and related systems for metalworking, construction, maintenance and other applications.

For more information on
Miller Electric
Circle 52 on Reader Service Card

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Circle 205 on Reader Service Card

Båtservice Wins Additional Ferry Order For \$2.3 Million



The *Alvsnaabben 4* is part of a series of ferries for which Båtservice Holding AS will build an addition.

Only a few weeks after the launch and christening of the newly built ferry bound to sail within the Fjord of Gota Älv in Gothenburg, Styrsobolaget has ordered yet another ferry of the same type from the Mandal-based Norwegian shipyard Båtservice Holding AS.

Thanks to the new timetable with frequent departures, the inhabitants of Gothenburg consider ferry traffic a rapid, efficient and comfortable way to travel within Gothenburg.

With this newly ordered ferry, the departures will be as frequent as every 20 minutes. Since September 1993, the number of people who use this popular series of ferries, called *Alvsnaabben*, has increased by 60,000 — to 140,000 each month.

The ferry will be a 101.7-ft. (31-m) monohull with a capacity of 450 passengers. The order is worth approximately \$2.3 million and delivery is planned to for Aug. 14, 1995.

The design and engineering will be carried out by Fartygskonstruktioner AB in Uddevalla, Sweden, with whom Båtservice Holding has had productive experiences with in the past.

For more information on Båtservice Holding
Circle 20 on Reader Service Card

Mobil Registers Tanker In Marshall Islands

Mobil's 280,000-dwt double-hulled tanker *Eagle* will become one of the largest ships in the registry of the Marshall Islands, and the seventh Mobil has elected to register there.

Gerhard E. Kurz, president of Mobil Shipping and Transportation Company, on behalf of the Trust Company of the Marshall Islands — the administrator of this registry — presented a model of the new tanker to **Amata Kabua**, president of the Republic of the Marshall Islands. The Trust Company is an affiliate of International Registries, Inc., of which Mr. **Kurz** is a director.

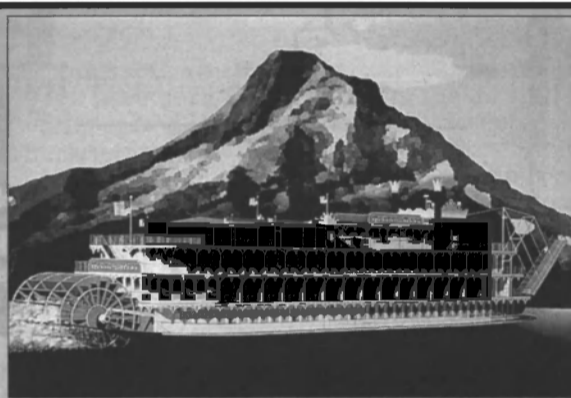
As an advocate of quality shipping, maritime safety and protection of the marine environment, Mr. **Kurz** asserted that "the commitment of the Marshall Islands to safer ships and cleaner oceans has caused Mobil to register seven ships under [its] flag." Mr. **Kurz** also stated that he had "no doubt in the coming years the Marshall Islands' flag will be carried by more and more ships and be seen in every port of the world."

The Marshall Islands registry, initiated in 1988, numbers 68 vessels totaling 2.3 million gt. Mobil vessels account for 32 percent, or 831,000 tons of the Marshall Islands' total.



His Excellency **Amata Kabua**, president of the Republic of the Marshall Islands (second from right), inspects a model of Mobil's 280,000-DWT double-hulled tanker *Eagle*, one of the largest ships in his country's registry and the seventh to be registered with the Marshall Islands by Mobil. The model was presented by **Gerhard E. Kurz** (right), president of Mobil Shipping and Transportation Company, on behalf of the Trust Company of the Marshall Islands, the administrator of this registry. Also in the picture are **Archibald N. Stewart**, chairman of International Registries, Inc. and chairman of the Trust Company of the Marshall Islands (third from right), and **Paul F. Kea**, president of Mobil Oil Micronesia.

In May 1988, the *Eagle* will be joined by its sister vessel, tentatively named *Osprey*. Mobil has options for two more vessels of this class.



M/V Queen Of The West: Artist conception of the new sternwheeler Nichols Bros. will build for Sternwheeler Boat Company of Portland, Wash. The 230-ft. (70-m) sternwheeler *M/V Queen of the West* will carry 149 overnight passengers on the Columbia River beginning next summer. Nichols Brothers Boat Builders, Inc., Whidbey Island, Wash., is building the vessel for the Sternwheeler Boat Company, Inc. of Portland, Ore.. The vessel was also designed by Nichols Brothers. Fifty feet abeam and drawing six feet fully loaded, the vessel will be propelled by a 26-ft. (7.9-m) diameter sternwheel. Power will be supplied through a hydraulic system by two, 1,600-hp MTU 396 diesel engines. Detroit Diesel 8V92 engines will drive two 330-kW generators to supply service power.

For more information on Nichols Brothers
Circle 21 on Reader Service Card

Smit Refloats Massive Single-Crane Ship, Supports Drill Rig

Salvage teams from Smit Tak Rotterdam and Singapore, with two other salvors, completed the salvage of the *OHI 5000* — reportedly, the world's largest oceangoing single-crane ship. The vessel was redelivered to its owners in a drydock at Ulsan, South Korea.

The *OHI 5000* was the result of a nine-month project converting the 1,800-ton heavy lift crane ship *DB Sarita* into a vessel with a gross lifting capacity exceeded only by its four semisub, twin-crane derrick barges.

The *OHI 5000* had completed sea trials and been delivered to OHI of Singapore only a few months before Typhoon Seth struck the Korean coast. The vessel broke its moorings and was driven against the quay at the Hyundai yard and later went aground. It suffered extensive underwater damage, with heavy loss of shell plating. The engine room and 17 of its 20 ballast tanks (some converted into workshops) were flooded.

Smit Tak's **Geert Koffeman** says: "We formed

a working partnership with two other International Salvage Union members — Jinil and Nippon Salvage — to respond to this emergency." According to Mr. **Koffeman**, considerable work was entailed. "This included pumping, welding and patching on a major scale. Tanks were dewatered and pressurized, booms were deployed around the vessel and a variety of pollution prevention tasks were performed — including skimming in the engine room and other spaces. The vessel was also lightened by removing her 1,000-ton and 300-ton cranes. The team's efforts were rewarded with a successful refloating of the *OHI 5000*."

Smit-Lloyd Wins Enterprise Contract In Romania

Smit-Lloyd is working in Romanian waters for the first time, following a contract award from Enterprise Oil and Exploration. Under this agreement, the *Smit-Lloyd 109* and *Smit-Lloyd 115* were busy on the Romanian Continental Shelf, providing anchor-handling, towage and support services for the drill rig *Ocean Liberator*. The latter is to drill two wells for Enterprise.

Smit-Lloyd Manager **Aart Broek** says: "The wells are to be drilled at a location east of Constanza; our vessels will provide the necessary offshore support for at least 120 days."

On the Dutch Shelf, Smit-Lloyd secured an extension to its contract with Wintershall, which will run another year. Under the agreement, the 4,500-bhp *Smit-Lloyd 33* is supporting exploration and production activities, working from the Ijmuiden supply base.

During the last few weeks of 1994, *Smit-Lloyd 31* undertook a towage assignment for Smit Maritime Contractors — the relocation of the

heavy pull barge *Taklift 8* from Denmark's Storebaelt fixed link project to a new assignment in Spanish waters. The *Taklift 8* is required for the marine works associated with the construction of a new outfall for the city of Barcelona.



Damage to the quay resulting from contact with the *OHI 5000*. Typhoon Seth also resulted in the grounding of five smaller crane barges in the area near Ulsan, South Korea.



The *Smit-Lloyd 109* and the drill rig *Ocean Liberator*, for which Smit-Lloyd won a support contract.

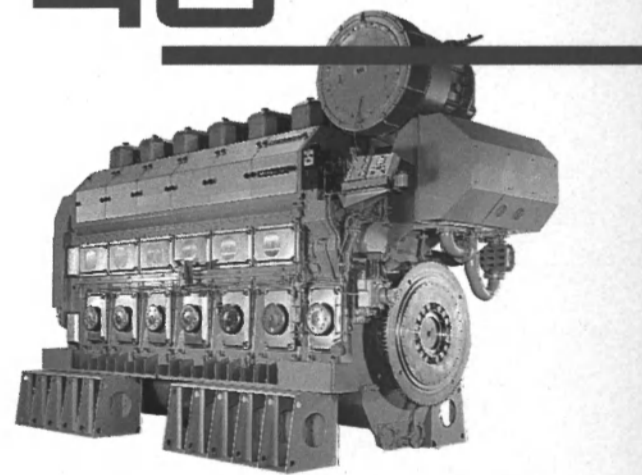
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PROPULSION UPDATE

Cat Debuts 3500 Series B

New Caterpillar engine line designed for high performance, fuel efficiency and low NOx emissions through electronic control

by Dan Maniotis, senior editor

Caterpillar Engine Division has unveiled a new series of diesel engines based on its 3500 family. With prototypes completed and beta-tested, and full-scale production to begin soon, the 3500 Series B retains the field-proven 3500's general configuration, but offers significant improvements. Mechanical enhancements and advanced electronic control systems combine in the Series B to offer a diversity of operational modes — for minimized emissions or maximized fuel efficiency.

Three models are currently available: the 3508B, 3512B and 3516B. All come in lightweight, high-performance configurations. To fill its customer's demands for more power Caterpillar focused on higher ratings, and the new engines have increased horsepower ratings per cylinder — between 17 and 30 percent higher.

The 3516B at the A (or continuous) rating produces 2,000 hp at either 1,600 or 1,800 rpm (17 percent, or 290 hp, greater); the 3508B at the Ehp, or high performance, rating produces 1,500 hp at 1,925 rpm (a 30 percent or 350 hp increase).

The 3508B is rated 1,500 hp, the 3512B at 2,250 hp, and the 3516B at 3,000 hp, all at 1,925 rpm.

John Hafner, Caterpillar's 3500 product manager, spoke about the difficulty in providing for both the low NOx and low Base Specific Fuel Consumption (BSFC) markets for Cat engines: "Previously, those two requirements — reduced emissions and increased fuel economy — were incompatible. Users who purchased an engine that provided reduced emissions often had to sacrifice fuel economy. On the other hand, users who placed a priority on superior fuel economy had to live with higher emission levels. But now,

with the 3500 Series B, users are no longer faced with an either/or situation." Mr. Hafner said a 3500 Series B set up for low NOx emissions offers fuel economy at least equal to, and in some cases better than, the current 3500 family. "We're talking about NOx emissions of between four to six grams per horsepower hour, or two grams per normal cubic meter," he said.

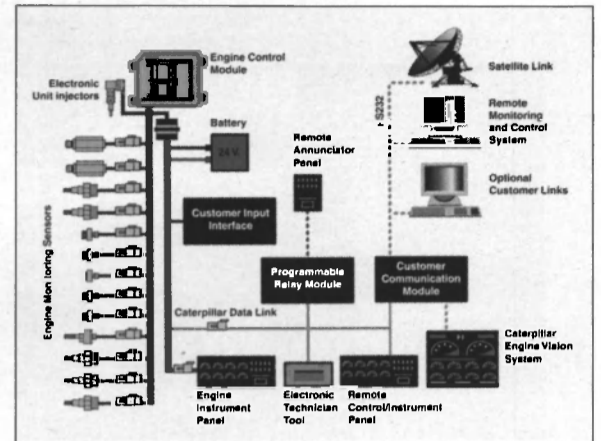
The B Series is designed to provide the best of both worlds — largely through an intelligent, synergistic combination of design improvements in the engine — which brings the greatest benefits primarily in the area of fuel injection.

"Hardware" Improvements

The new engines have larger camshafts for increased injection pressure of shorter duration. Also new to the B Series is a deep-crater piston design that increases the turbulence in the combustion chamber, resulting in improved air/fuel mixing. Crevice volume is reduced, due the piston's higher crown perimeter — keeping more air in the combustion chamber, minimizing waste charge air. Aftercooler water temperatures are cooler, and exhaust manifolds are streamlined, both of which also contribute to engine efficiency.

Unit injectors have a 22,000 psi injection pressure and a highly developed injector spray tip geometry, improving fuel atomization and injection timing. That's the "hardware" side of the fuel injection equation.

But that hardware — i.e., the injectors — is controlled by sophisticated electronic systems, particularly the Electronic Control Module (ECM), optimizing the fuel injection process over a host of operating conditions.



The Caterpillar B Series' advanced electronics systems give the customer increased control over engine operation, and options include the Customer Communications Module, which translates engine data into standard RS232 computer language for downloading to a standard PC, or even transmission by satellite to remote locations.

"Software" Control

Fuel injection fluctuates, depending on such variables as engine load and speed. The ability to regulate the start and end points of injection — across all engine conditions, loads and speeds — affords various benefits.

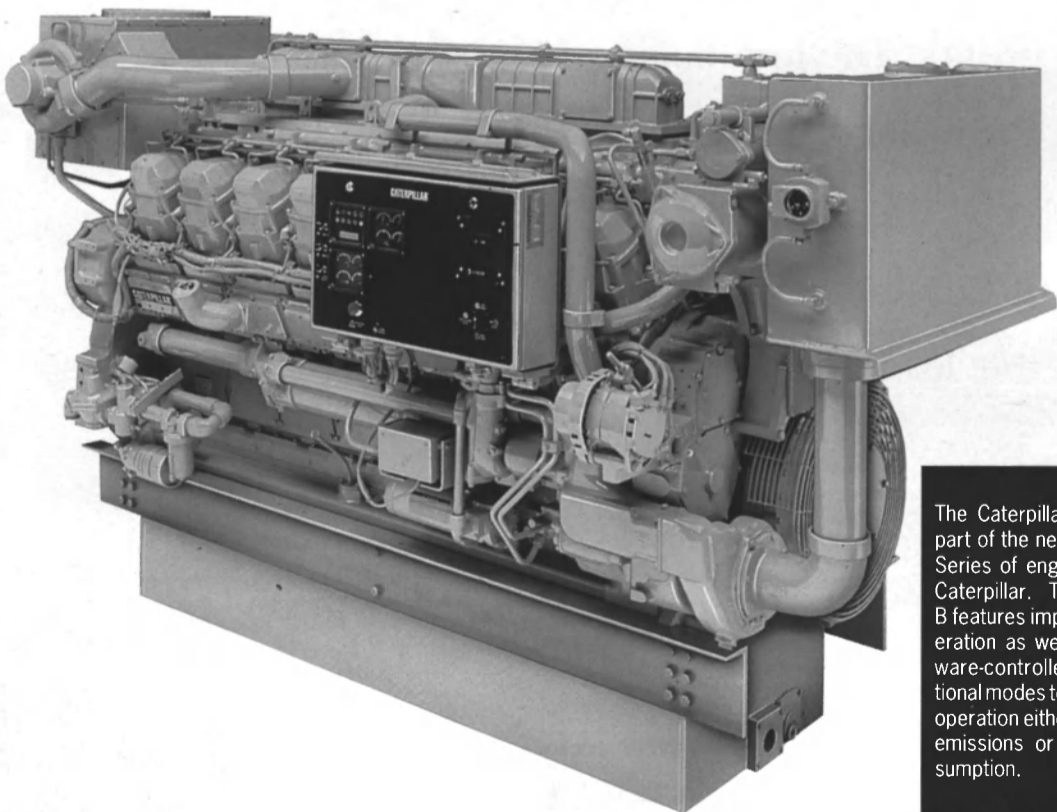
Two main modes will likely attract the most attention to the new Cat Series B — Low NOx Mode, and Low BSFC Mode.

According to Caterpillar, fuel consumption can be reduced by as much as 15 percent and emissions levels are still improved. If the user chooses the opposite end of the operating spectrum, or the Low BSFC Mode, emissions levels are still up to 10 percent lower than with the 3500 series. And of course, that's only when the user wants to become involved. Also programmed into the ECM is the ability to analyze operating information from engine sensors, then adjust injection timing and duration on a constant basis to optimize fuel efficiency and minimize emissions — completely automatically. Caterpillar also says this level of control plays a large role in the engine's virtually smokeless operation, even during startup and rapid acceleration.

The ECM reports all information through a four-wire Cat Data Link to the Electronic Instrument Panel, which in turn can be connected to as many as six remote engine monitoring panels. Every time a sensor detects a problem with the engine's operation, a fault code is registered and stored for later review. Should a malfunction eventually require servicing, the technician can check the logged fault codes and possibly get a line on how the problem developed.

The engine can protect itself in three basic ways: alarms, deratings and shutdowns. Should a sensor detect a serious enough fault in operation, the derating feature allows the engine to derate itself gradually, in 2-3 percent increments — so minimal power generation is lost as the engine protects itself against dangerous operating zones caused by air inlet restriction, insufficient cooling, high exhaust temperature, overspeed, etc. The 3500 Series B will be manufactured at Caterpillar's ISO 9001-certified Large Engine Manufacturing facility in Lafayette, Ind. Options available for the 3500 Series B include the Customer Communications Module, which provides a link to a standard IBM-compatible PC. Cat ET, or Electronic Technician, a Windows™ software program with graphical interface, which takes the information provided through the RS232 link and provides real-time models of engine performance.

For more information on Caterpillar's 3500 Series B Circle 80 on Reader Service Card



The Caterpillar 3512B, part of the new 3500 B Series of engines from Caterpillar. The Series B features improved operation as well as software-controlled operational modes to optimize operation either for NOx emissions or fuel consumption.

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Circle 20 on Reader Service Card

Strong Demand Drives New Orders

By Greg Trauthwein, Editor

The cruise ship industry has a resilience which should be the envy of any world industry. Despite a general global economic slowdown, cruise ship operators are attracting passengers and ordering ships at a record pace.

During the recession — which started in the early 1990s and stretched a few years — Royal Caribbean Cruise Lines (RCCL) added

three ships (*Nordic Empress*, *Monarch of the Seas*, and *Majesty of the Seas*) and 6,000 berths. By the estimation of **Rod McLeod**, executive vice president of sales and marketing and passenger services, "We did quite well."

Also, consider this:

- Carnival Corp. announced orders for two ships from Fincantieri totaling \$650 million (see related story,

page 48). For those keeping score, Carnival Corp.'s newbuilding program in the 1990s will total 15 new vessels representing an investment of approximately \$4.3 billion;

- Between 1995 and 1998, RCCL plans to introduce as many as six ships with a capacity for 11,500 passengers, to go with its current fleet of nine vessels capable of carrying 14,228 passengers;

- Princess Cruises has three ships currently under construction at Fincantieri, totaling more than \$1 billion. Included is the 104,000-ton *Grand Princess*, the largest cruise ship ordered to date.

1994-1998 Cruise Ship Additions

Cruise Line	Addition/Deletion	Delivery Date	Name	# Berths	Contract/Planned	New/Used
1994						
CCL	A	5/94	Fascination	2,021	C	N
Celebrity Cruises	D	1994	The Azur	-660	C	U
Costa Cruise Lines	D	10/94	Eugenio Costa	-842	P	U
Cunard EuropAmerica River	A	1994	Dresden	112	C	U
Cunard EuropAmerica River	A	1994	Mozart	208	C	U
Holland America Line	A	10/94	Ryndam	1,266	C	N
Norwegian Cruise Line	D	1994	Westward	-832	C	U
Royal Cruise Line	A	5/94	Star Odyssey	775	C	U
Royal Cruise Line	D	5/94	Golden Odyssey	-450	C	U
Regency Cruises	A	4/94	Regent Jewel	500	C	U
Seabourn Cruises	D	1994	Seabourn Spirit	-8	Reallocation	
Seabourn Cruises	D	1994	Seaborn Pride	-8	Reallocation	
Silversea Cruises	A	1994	Silver Cloud	306	C	N
Silversea Cruises	A	1994	Silver Wind	306	C	N
				CLIA TOTAL	2,694	
American Canadian Line	A	8/94	Niagara Prince	84	C	N
American Family Cruises	A	12/94	American Pioneer	922	P	U
				NON-CLIA total	1,006	
				1994 TOTAL	3,700	
1995						
CCL	A	7/95	Imagination	2,021	C	N
Celebrity Cruises	A	11/95	Century	1,740	C	N
Crystal Cruises	A	5/95	Crystal Symphony	960	C	N
Delta Queen Steamboat Co.	A	1995	American Queen	436	C	N
RCCL	A	4/95	Legend of the Seas	1,808	C	N
Regency Cruises	A	4/95	Regent Sky	1,400	C	N
				CLIA TOTAL	8,365	
Swedish American Cruises	A	6/95	Radisson Kungsholm	232	C	N
				NON-CLIA total	232	
				1995 TOTAL	8,597	
1996						
CCL	A	4/96	Inspiration	2,021	C	N
CCL	A	1996	Unnamed	2,600	C	N
Celebrity Cruises	A	10/96	Galaxy	1,740	C	N
Costa Cruise Line	A	8/96	Unnamed	1,800	P	N
Holland America Line	A	10/96	Veendam	1,266	C	N
Princess Cruises	A	1/96	Sun Princess	1,950	C	N
RCCL	A	1996	Splendour of the Seas	1,808	C	N
RCCL	A	1996	Unnamed	1,950	C	N
Silversea Cruises	A	1996	Unnamed	360	C	N
				1996 TOTAL	15,495	
1997						
Celebrity Cruises	A	11/97	Unnamed	1,740	C	N
Princess Cruises	A	5/97	Unnamed	1,950	C	N
Princess Cruises	A	10/97	Unnamed	2,600	C	N
RCCL	A	1997	Unnamed	P	N	
Silversea Cruises	A	1997	Unnamed	360	C	N
				1997 TOTAL	8,600	
1998						
Princess Cruises	A	10/98	Unnamed	2,600	P	N
				1998 TOTAL	2,600	

Source: CLIA

The mind-boggling statistics go on, but the bottom line is this: the cruise ship industry is in a long term growth mode which equates to good business prospects for those companies involved in the build, repair and supply of the ships.

"We see the state of the industry as very healthy," said **Richard M. James**, senior vice president sales & corporate relations, Princess Cruises.

This feeling is backed by investment, in the form of the new ships being built by Fincantieri and mentioned above (specifically, sisterships the *Sun Princess* and *Dawn Princess*, each 77,000-ton, 1,950 passenger, \$295-million; and the *Grand Princess*, which will carry 2,500 passengers and cost \$385 million).

"I think we are continually viewing opportunities, and we have an option for another ship beyond the three on order. We are still very bullish on the industry."

Deliveries In 1994

Two outstanding cruise ships delivered in 1994 include the Kvaerner Masa-Yards-built *Fascination* for Carnival Cruise Lines (CCL), and the *Ryndam*, built by Fincantieri for Holland America Line (HAL).

The 2,600-passenger *Fascination* cost an approximate \$315 million and was delivered by Kvaerner Masa-Yards in June.

The ship measures 855 ft. (260.6 m) long with a 103-ft. (31.4-m) beam and a 25.75-ft. (7.9-m) maximum draft.

It features a propulsion package consisting of a diesel-electric propulsion systems — with six medium speed engines developing approxi-

mately 56,000 hp; three 2,040-hp bowthrusters; three 2,040-hp sternthrusters; and twin rudders which are individually controlled. All told, the vessel has a speed of 22.3 knots.

The *Ryndam* is a 55,451-gt ship which entered service on October 20. This is the third ship in the company's 121-year history to bear the *Ryndam* name, and was designed to combine old world tradition with state of the art technology. The ship measures 720 ft. (219.5 m) long, with a 101-ft. (31-m) beam, and has 10 passenger decks.

The ship — capable of carrying 1,266 passengers and 571 crew — is the third in the series of four ships for HAL, following the *Statendam* (Jan. 1993) and the *Maasdam* (Dec. 1993); but preceding the *Veendam*, which is scheduled for delivery in the spring of 1996. The Bahamian-registered vessel is capable of speeds up to 22 knots.

New Business Opportunities

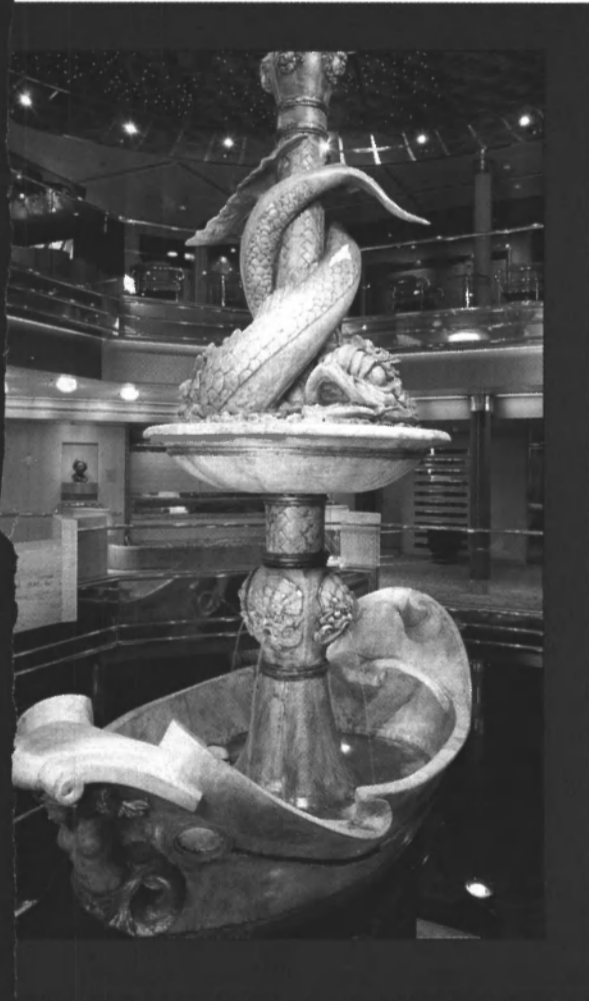
No fewer than six breakthrough ships will be delivered in 1995 in the U.S. alone (see chart, page 46).

"Cruise ship construction will reach new heights in design and technology moving into the 21st Century, amid great excitement and optimism as the industry's upward growth continues as well," said **James G. Godsmann**, president of Cruise Line Industry Association





BELOW: Holland America's *Ryndam* was built by Fincantieri and sailed its maiden voyage in October.



February, 1995

(CLIA). CLIA estimates that by the year 2000, eight million people per year will take a cruise, up from the estimated 4.8 million passengers carried in 1994. Average annual passenger growth rate was 9.2 percent between 1980 and 1993.

"The entire industry continues in a growth spiral, but the bottom line is that the industry still has a long way to go," said **Lawrence Dessler**, director of public relations, Holland America Line Westours Inc. "There still is a very large potential cruise market that will drive growth." At the time of the interview, Mr. Dessler said, "I don't think Holland America Line is done in terms of new ship orders." Less than two weeks later he was proven a prophet, as news broke that parent company Carnival Corp. had placed an order for a new ship for HAL.

Part of the aforementioned \$650 million order which Carnival Corp. placed with Fincantieri was for the first vessel of a new ship line for HAL, dubbed the *Fastdam*.

According to Mr. Dessler, the new *Fastdam* line is engineered to maintain speeds in excess of current newbuilds in order to execute worldwide itineraries. The as yet unnamed ship will be approximately 62,000-grt, will be designed to carry 1,320 passengers in 660 cabins, and will have a top speed of 25 knots. Delivery of the new ship is scheduled for the fall of 1997.

Carnival Corp. also ensured the long-term capacity needs of Carnival Cruise Lines will be met with an order for a second 100,000-ton ship from Fincantieri. The vessel will feature 1,300 cabins capable of carrying 2,600 passengers, and is scheduled for delivery in late 1996.

"There has been a growing excitement in the company as we fleshed out the designs of the world's first 100,000-ton cruise ship," said CCL President **Bob Dickinson**, in a press release. "We know even now that we have a tremendous hit on our hands and really were simply compelled to commit for a second at this time."

ABOVE: The \$250-million, 960-passenger *Crystal Symphony* is being built by Kvaerner Masa-Yards.

BELOW: The \$315-million *Fascination* was built by Kvaerner Masa-Yards and delivered in June.



Cruise Shipping Annual

The order for the two Fincantieri-built ships came one week after Carnival Corp. placed an order for two ships — for CCL — with Kvaerner Masa-Yards.

Miami-based Celebrity Cruises currently has a series of three 72,000-ton ships under construction

at Meyer Werft in Germany, and recently named the second ship of that series *Galaxy*.

The *Galaxy* is due for delivery in the 3rd quarter of 1996, while the first ship of the series, the *Century*, is scheduled for delivery in December 1995.

New Ship Demand

It's no mystery that ships are getting bigger, but that trend is more a result of fleet diversification and changing customer needs than anything else.

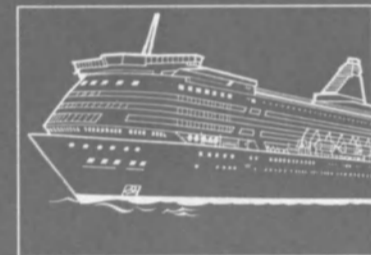
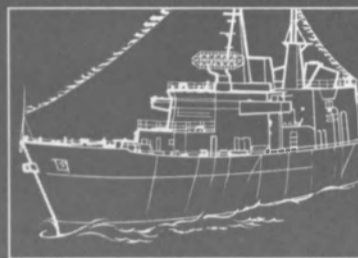
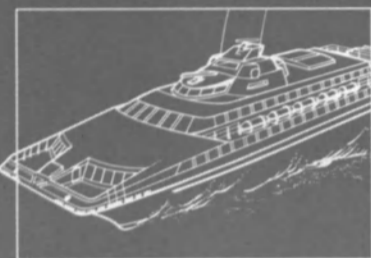
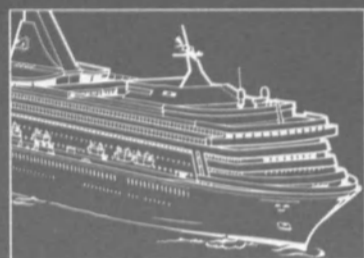
"I think we are all looking at our fleets much as a golfer looks at his

golf bag," reasoned RCCL's Mr. **McLeod**. "You have a range of clubs for different purposes. I don't think we've hit the top in the size of cruise ships ... but maybe we are close."

"Our assessment (when considering to build a ship) is of the ability of the company to fill that vessel. We ask, does the market need that capacity? I think we've answered that — rather eloquently — with recent orders," he concluded.

RCCL is currently developing a new class of large ships, a developmental program named Project Eagle.

Princess Cruises, which at press time had the reported largest ship under construction (the 104,000-ton *Grand Princess*), is not singularly focused on size. "The intent was not to just build the largest, it was to offer the most options on board," said Mr. **James**. "If we want to expand the market, we've got to offer new and different things for passengers to experience onboard."



For more information on the shipyards mentioned in this story circle the appropriate number on the Reader Service Card in this issue.

Fincantieri 109
Kvaerner Masa-Yards 110
Meyer Werft 111

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Setting Sail In 1995

Several notable cruise ships are planned for delivery in 1995. Here is the rundown on the ships to come:

Ship: Legend of the Seas
Owner: RCCL
Yard: Chantiers de l'Atlantique
Cost: \$325 million
Capacity: 1,804

Ship: Century
Owner: Celebrity Cruises
Yard: Meyer Werft
Cost: N/A
Capacity: 1,750
Engines: MAN B&W
Props: Lips

Ship: Crystal Symphony
Owner: NYK
Operator: Crystal Cruises
Yard: Kvaerner Masa-Yards
Cost: \$250 million
Capacity: 960
Engines: Sulzer

Ship: Imagination
Owner: CCL
Yard: Kvaerner Masa-Yards

Carnival: Orders Two Ships For \$650 Million

Carnival Corp. reached agreements with Fincantieri Cantieri Navali Italiani S.p.A. for the construction of two cruise ships at a combined cost of approximately \$650 million. One ship will be for its Carnival Cruise Line (CCL) unit, the other for its Holland America Line (HAL) subsidiary.

The ship being built for Carnival Cruise Lines will be a sister to a vessel already under construction at Fincantieri. That ship has 1,300 cabins for a capacity of 2,600 passengers, and will be 100,000 grt and delivered in late 1996. The ship just contracted for is expected to be delivered at the end of 1998.

For Holland America, Fincantieri will begin a new class of vessel of approximately 62,000 grt. The ship will accommodate 1,320 passengers in 660 cabins, and will have a top speed of 25 knots. Delivery to Holland America is expected in the fall of 1997. The contract announcement was the second time in a week that Carnival Corp. finalized new ship agreements. One week prior to this order, it released details of a \$600 million contract with a Finnish shipyard for the construction of two vessels for CCL. These most recent announcements bring Carnival Corporation's current orderbook for new ships to eight vessels at a cost of approximately \$2.5 billion. "When you consider this comes on the heels of seven new ships in just the last four years, costing more than \$1.8 billion, it's apparent that our investment in the future of the cruise industry is significant and our confidence in its continued development is unwavering," said Carnival Chairman and CEO Micky Arison, in a release. The eight ships on order represent more than 16,000 new berths. "That, in and of itself, is more than the largest individual cruise line in the world currently has — which is Carnival Cruise Lines with 14,756 beds." Carnival Corporation's newbuilding program in the 1990s includes 15 new vessels, totaling almost 28,000 beds, representing an investment of approximately \$4.3 billion.

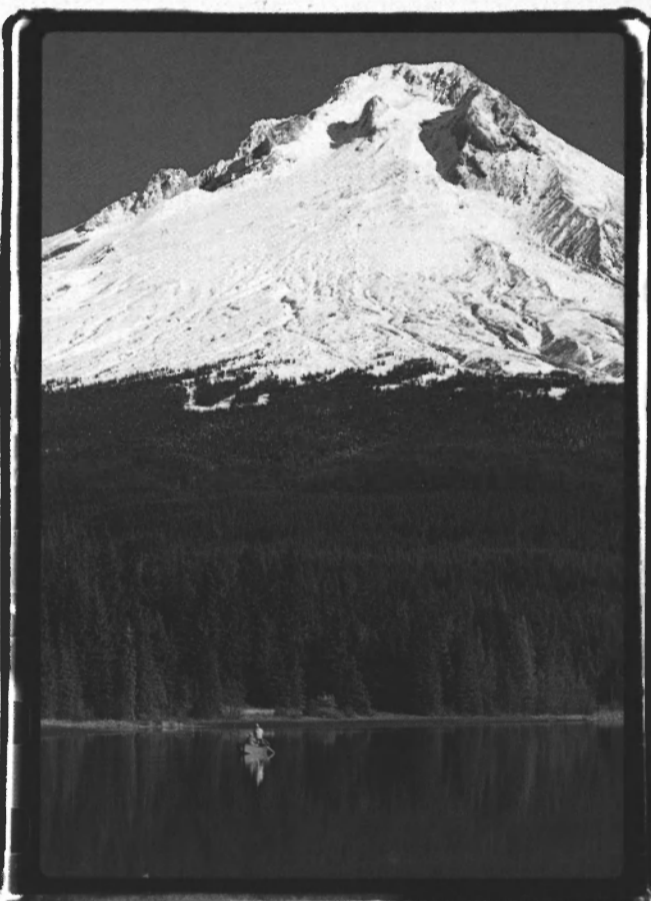
Fincantieri has previously delivered three 55,000-grt vessels for Carnival Corp.'s Holland America unit. A fourth in that series is under construction at the Italian shipyard. "Our passenger response to the *Statendam*, *Maasdam* and *Ryndam* has been nothing short of spectacular, and the *Veendam*'s arrival in spring of 1996 will round out that series," said Holland

America President **Kirk Lanterman**. He added that the additional speed will allow Holland America to offer some new and unusual itineraries. For Fincantieri, the agreement extends its association with the world's largest cruise company. "We have truly enjoyed working with all the people at both

Carnival Cruise Lines and Holland America who are the innovators in their industry and we look forward to continuing that relationship," **Corrado Antonini**, CEO of Fincantieri, said in a release. Carnival Corporation is comprised of Carnival Cruise Lines, Holland America Line, Windstar Cruises and

Seabourn Cruise Line (25 percent owned), which combined, operate 21 ships in the Caribbean, Alaska and other worldwide destinations. In addition, Carnival holds a 43 percent interest in Athens, Greece-based Epirotiki Lines.

For more information on Fincantieri Circle 107 on Reader Service Card



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Cruise Shipping Annual

Cruise Industry: Prepare for expansion

CLIA report predicts 8 million passengers by year 2000

Terming the cruise industry the most exciting vacation category in the U.S. and Canada, and more

important, having the passenger growth numbers to back it up, the most recent report from the Cruise

Line International Association (CLIA) paints a positive picture for the prospect of more newbuilding orders through 1995 and beyond.

According to the CLIA Passenger Carrying Reports, the average growth rate in terms of passenger capacity has been 9.2 percent from 1980 to 1993. In 1994 alone, CLIA

estimated that 4.8 million passengers traveled on cruise ships. In trying to predict how passenger capacity will fluctuate in the years to come, the CLIA Market Profile Study shows that 60 percent of its target population (25 years and older, household income of \$20,000+ per year) reports that they are interested in taking a cruise. Based on this number, CLIA estimates that the existing cumulative market potential over the next five years could be as high as \$87 billion — an increase of 14.4 percent from 1992 when the potential was \$76 billion. Encouraging is the fact that more than 37 percent of the target group reports that they intend to take a cruise within five years. By the year 2000, the association predicts that eight million passengers per year will cruise.

In order to keep capacity in line with North American demand, average capacity rose at a rate of eight percent from 1981 to 1993, according to CLIA. Based on current numbers, cruise ship capacity will be increased at a rate of 5.6 percent (contractual) and 6.6 percent (contractual and planned) over the next five years. Based in New York, CLIA member lines represent 95 percent of North American marketed berths.

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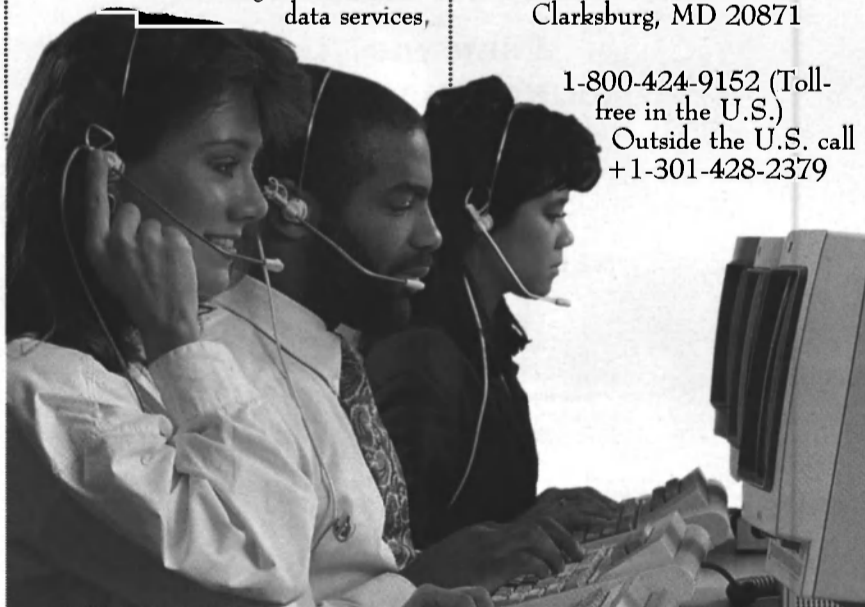
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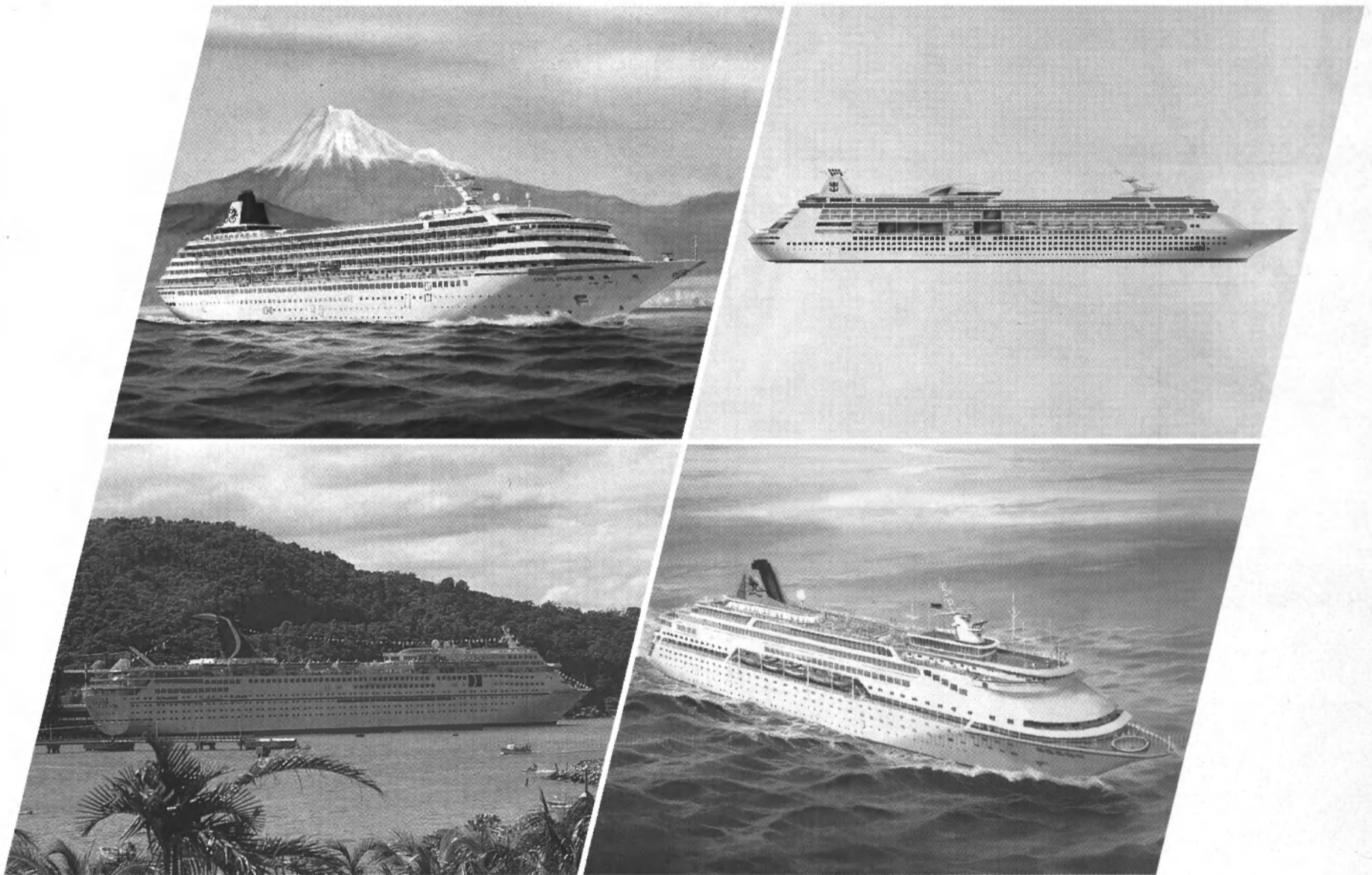


Cruise Line Capacity

CLIA Member Lines	No. Lower Berths	No. Ships
American Hawaii Cruises	1,489	2
Carnival Cruise Lines	12,514	8
Celebrity Cruises	6,037	6
Commodore Cruise Line	744	1
Costa Cruise Lines	5,984	7
Crystal Cruises	960	1
Cunard Crown	2,126	3
Cunard Line	4,563	7
Cunard EuropAmerica	—	—
River Cruises	456	3
Delta Queen Steamboat Co.	592	2
Diamond Cruise	3,543	1
Dolphin Cruise Line	2,143	3
Epirotiki Line	3,840	8
Holland America Line	7,515	6
Majesty Cruise Line	1,056	1
Norwegian Cruise Line	8,408	6
Oceanic Cruises	120	1
Orient Line	845	1
Pearl Cruises	1,016	2
Premier Cruise Line	3,038	3
Princess Cruises	10,080	9
Regency Cruises	3,747	5
Royal Caribbean Cruise Line	14,228	9
Royal Cruise Line	2,239	3
Royal Viking Line	970	2
Seabourn Cruise Line	424	2
Seawind Cruises	624	1
Seven Seas Cruise Line	172	1
Sun Line Cruises	1,098	3
Windstar Cruises	444	3
World Explorer Cruises	440	1
Total	98,230	111

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and Annapolis, MD, USA is a wholly owned marketing and consulting engineering company. Kvaerner Masa-Yards employs 4700 people.

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Kvaerner Masa-Yards

Wärtsilä 46 Engines Chosen For RCCL Vision 1000 Ships

The Wärtsilä 46 engine was selected by Chantiers de l'Atlantique of France to be installed in one of Royal Caribbean Cruise Line's Vi-

sion 1000 series of luxury cruise vessels, with an option for installing in another vessel in the series.

The order is for four Wärtsilä 12V46 engines for the diesel-electric propulsion package. The engines will each have an output of 12,600 kW at 514 rpm, and run on 700 cSt/

50°C fuel.

The engines will be delivered from the engine manufacturer's Turku, Finland factory in March 1996.

Wärtsilä Diesel has previously delivered five 46 engines for the *Legend of the Seas* and five 46 engines for the *Splendour of the Seas*,

both built for RCCL by Chantiers de l'Atlantique.

For more information on Wärtsilä Diesel
Circle 13 on Reader Service Card

New Shower Valve Helps Prevent Scalding

FM Mattsson Co. developed what it calls a simple and safe solution to the threat of scalding in marine showers.

The company combined two technologies to create a thermostatically controlled and pressure balanced shower valve. The technology reportedly solves the problem of fluctuations in water temperature at the shower outlet.

Company tests have shown that the valve is able to maintain a stable shower temperature of $\pm 1^\circ\text{C}$ under extreme and rapid changes of both pressure and temperature.

The Scanmix Corp. was chosen by FM Mattsson to market and distribute its products to the marine industry.

For more information from Scanmix
Circle 18 on Reader Service Card

RCCL's *Song Of Norway* Damaged During Panama Canal Transit

Royal Caribbean Cruise Line's (RCCL) 22,945-ton cruise ship *Song Of Norway* suffered damage during a Panama Canal cruise when its starboard propeller struck a submerged object outside the locks on the Atlantic side of the canal. None of the 972 passengers or 435 crew were injured.

Song Of Norway was under the direction of a Panama Canal Commission pilot at the time of the incident and was in the middle of a 10-night cruise.

The ship completed its Panama Canal transit under its own power after a brief delay while divers surveyed the damage, which was limited to the starboard propeller assembly.

RCCL Celebrates 25th Anniversary With New Ship, New Itineraries

Royal Caribbean Cruise Line (RCCL) celebrates its 25th anniversary in 1995 with a new ship and new itineraries that extend the company's reach around the globe. In May, the first of as many as six new ships in the next 3.5 years makes its debut; the company will boost its commitment to Alaska and Panama Canal cruises; sail its first-ever cruises to the Hawaiian Islands; offer a series of farewell

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cruises aboard *Nordic Prince*; and become the largest cruise line ever to base a ship in the Far East year-round. "Royal Caribbean's rapid growth will make 1995 a very exciting year," said **Rod McLeod**, Royal Caribbean's executive vice president of sales, marketing and passenger services.

On May 16, 1995 Royal Caribbean's 1,804-passenger, 70,000-ton *Legend of the Seas* sails its maiden voyage. Under construction in French shipyard Chantiers de l'Atlantique at a cost of approximately \$325 million, *Legend of the Seas* will reportedly be the fastest cruise ship built in the past quarter century and is the first of as many as six new megaships Royal Caribbean plans to introduce in the next 3.5 years. The ship will sail seven-night Alaska cruises during the summer and 10- and 11-night Panama Canal cruises in the winter, allowing RCCL to substantially increase its capacity in those two cruising areas. *Legend of the Seas* sails Royal Caribbean's first-ever Hawaiian Islands cruises in late September and early October, 1995 (see related story, this page.)

The 1,012-passenger, 23,149-ton *Nordic Prince* will leave RCCL service in early March after 24 years of service. *Nordic Prince* has been sold to British vacation company Airtours plc.

Beginning in December 1995, the 714-passenger, 18,455-ton *Sun Viking* will offer year-round cruises in the Far East. RCCL will be the largest cruise line ever to base a ship year-round in that region.

Royal Caribbean Cruise Line is one of the world's largest cruise lines and currently operates nine ships with a total capacity of 14,228 passengers — and will add as many as six more ships with a combined capacity of 11,500 passengers by mid-1998 (see chart, this page).

Engineering A Clear View

Royal Caribbean Cruise Line's newest ship, the 1,804-passenger *Legend of the Seas*, is believed to incorporate more glass than any other cruise ship afloat. More than

two acres of windows, suspended glass window walls, glass canopies, skylights and glass windbreaks will open the ship to panoramic views around every turn. The ship has been dubbed "The Ship of Light" by those who worked on its design.

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The RCCL Fleet

Ship Name	# of Passengers	maiden Voyage
Song of Norway	1,004	11/70
Nordic Prince*	1,012	7/71
Sun Viking	714	12/72
Song of America	1,402	12/82
Viking Serenade	1,512	1/90
Nordic Empress	1,600	6/90
Sovereign of the Seas	2,276	1/88
Monarch of the Seas	2,354	11/91
Majesty of the Seas	2,354	4/92
Legend of the Seas	1,804	5/95
Splendour of the Seas	1,804	3/96
Grandeur of the Seas	1,950	11/96
Rhapsody of the Seas	2,000	4/97
Enchantment of the Seas	1,950	9/97
Vision of the Seas	2,000	4/98

* *Nordic Prince* has been sold and will leave the Royal Caribbean fleet in March 1995.

Cruise Shipping Annual

The 70,000-ton *Legend of the Seas*' two-level dining room will be cradled by walls of glass nearly 20 ft. (6.1 m) high on either side. Since the dining room is placed in the superstructure rather than the ship's hull, the walls of the dining room do not have to bear any structural load and

can be made entirely of glass. The load-bearing function is handled by strategically-placed interior columns. The ship's atrium, a seven-deck high space called the Centrum, will feature windows and window walls its entire height, capped by a curving, sloped two-deck high glass

skylight.

The Solarium, a pool/spa/entertainment complex high in the ship with glass walls on either side, will be topped by a retractable 4,500 sq. ft. glass roof called the Crystal Canopy. Unlike glass roofs over similar spaces on other cruise ships,

Legend of the Seas' Crystal Canopy will be virtually all glass since it moves as an entire intact unit over the Solarium and does not fold and stack upon itself. This design means the roof can be built of light, non-load bearing aluminum supports rather than heavy steel, substantially increasing the amount of natural light in the Solarium when the Crystal Canopy is overhead.

Virtually all outside passenger cabins will have picture windows rather than portholes and 231 cabins will have balconies accessed by sliding glass doors. Balcony railings will be made of glass rather than steel so that passengers sitting inside their cabins can enjoy the passing scenery.

New Celebrity Century Series Designed With High Technology, Elegance

Celebrity Cruises' new 70,000-ton *Century*, currently under construction in Germany and scheduled for delivery in December 1995, is a 1,750-passenger ship designed as both a sophisticated and technically advanced vessel.

The \$320 million ship is being constructed by Joseph L. Meyer GmbH & Co., Papenburg, Germany, the same builders of Celebrity's *Horizon* and *Zenith*. Two sisterships, scheduled for delivery in Fall 1996 and Fall 1997, respectively, will be built by the same shipyard. This next phase of construction will bring the capacity of the six-ship Celebrity fleet to more than 9,000 berths.

Like the first generation of Celebrity vessels, *Century*'s profile is being crafted by **John Bannenberg**. Among the designers contributing to *Century* are Birch Coffey Design Associates (New York), John McNeece Limited (London), A&M Katzourakis (Athens), CD Designs (London), Yates-Silverman Inc. (Las Vegas) and Batwin/Robin (New York).

Century will feature a lower-berth capacity of 1,750 passengers. *Century*'s standard cabins will measure 172 sq. ft. The 1,173-sq.-ft. Penthouse Suites will be appointed with cherry-stained wood floors, antique accent pieces and oriental carpets, and feature separate living room, dining with butler's pantry and wet bar, entertainment centers, walk-in closet and dressing room, marble bathroom with twin sinks, guest powder room, sofa bed, sliding glass doors and veranda.

Century's two-deck Celebrity Theater will be created in the style of an outdoor amphitheatre, with cantilevered balconies providing unobstructed views for up to 950 guests.

Century's open decks will feature two swimming areas with cylindrical waterfalls, flanked by a bridge and rimmed with teak benches.



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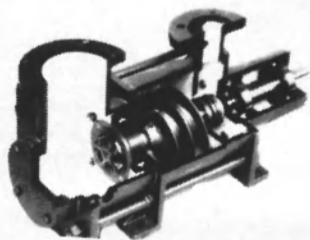
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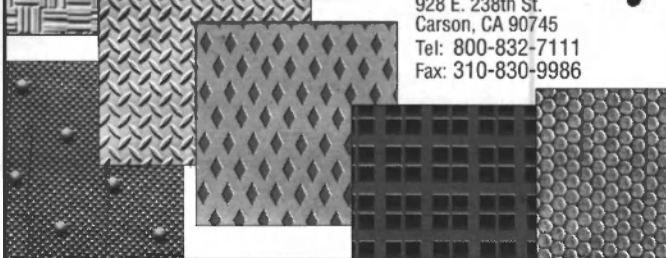
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PWH Continuous Unloaders For Far East

Continuous ship unloaders from Krupp Fordertechnik subsidiary PWH Anlagen + Systeme GmbH, based in St. Ingbert-Rohrbach, have proved their worth as environmentally friendly alternatives to traditional grab-type unloaders in many of the world's ports, the manufacturer claims.

For the Japanese market, PWH is to cooperate with NCW Nippon Crane Works Ltd., Tokyo, in building continuous ship unloaders using PWH know-how. The trading company, Nissho Iwai, a shareholder in NCW, will handle marketing and sales. In South Korea, a 10-year license agreement has been signed with Korea Heavy Industries & Construction Co., Ltd. (KHIC), of Changwon, for the construction of PWH continuous unloaders for the Korean market.

As a consequence of the cooperation, orders have already been received for two ship unloaders to be used for an unloading power station for Korea.

For more information on PWH
Circle 53 on Reader Service Card

MAN GHH Wins Contract From HHI

Hyundai Heavy Industries (HHI), South Korea, has awarded an order to MAN Gutehoffnungshütte AG to supply two THM 1304 D gas turbines having a drive power of 9,435 kW each for the generation of power.

HHI is building a liquid gas landing terminal for Korea Gas Corporation in Incheon, South Korea.

The gas turbines are equipped with a Dry-Low-NOx combustion chamber, jointly developed by MAN GHH and Siemens, which has reportedly obtained the lowest NOx emissions worldwide in the 10 MW power class. The turbines will be supplied to HHI in September, 1995, and the commissioning at the Korea Gas Corporation terminal is scheduled for 1996.

For more information on MAN GHH
Circle 55 on Reader Service Card

Supplylink To Provide Base Services For Namibia Drilling

Supplylink Intl. will provide base services at Walvis Bay in support of drilling operations offshore Namibia, under an award from Sasol and Norsk Hydro. The Supplylink International joint venture was established by Sidlaw Group of the U.K. and Smit International of Rotterdam in 1992. This company recently commenced operations at Immingham, providing new base facilities for operations in the southern basin of the UKCS through the subsidiary Humber Offshore Supplylink.

Working in cooperation with the local subsidiary of international

February, 1995

group Pescanova, Supplylink will provide base services to the drilling programs in Namibia, an offshore region equal in area to Gabon, Congo, Zaire and Angola combined.

Management Network Used For Twin-Managed Fleet

Argonaut AB, Swedish tanker owner, has built a communications network incorporating all its fleet

despite the vessels being managed by two separate ship management companies. Using Marinet communications software, the eight tankers of Argonaut are now part of an integrated system linking the ships to the worldwide offices of the owning company and the two ship management companies, Wallem Ship Management and Ugland Bros.

Ship to shore satellite transmissions are achieved in a number of ways: as a cc: mail message, as a fax

or telex, on an X.400 public network, or on an e-mail system. The Marinet message handling system reportedly provides savings as compared to normal satellite traffic. Companies are now able to have messages sent from a ship to a shore base at reportedly cheap rates, then transparently transferred to any point around the world at normal telecommunications costs.

For more information on Marinet
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Circle 302 on Reader Service Card



Flamingo Casino Delivery By Trinity Draws Record Turnout

The Hilton Hotels Corp., and New Orleans Paddlewheels, Inc., have taken delivery of another gaming boat built by the Trinity Marine Group (TMG). The new 322-ft. (98-m), 2,700-passenger, 300-crew-member *Flamingo Casino* is now operating from its berth on the Mississippi at the New Orleans Hilton Riverside Hotel.

More than 14,000 guests flocked to the new *Flamingo Casino* on opening day, setting a new daily atten-

dance record for the casino venture.

Designed in-house by TMG at its Equitable Shipyards, Inc. in New Orleans, the four decks of the *Flamingo Casino* have 30,000 sq. ft. of gaming space for 1,342 slot machines and 75 table games compared to 20,000 sq. ft. of gaming space, 773 slots and 39 table games on *Queen of New Orleans*.

The *Flamingo Casino* gets underway propelled by an authentic stern paddlewheel, powered by two

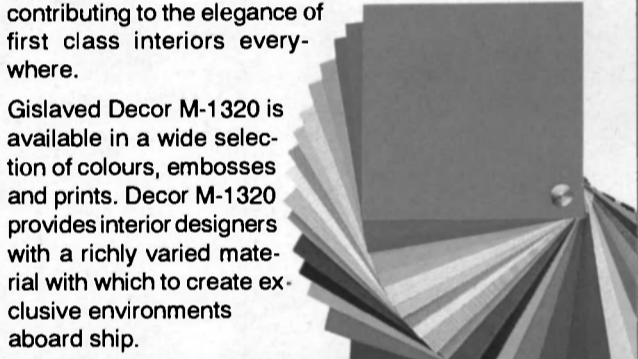
750-hp D.C. motors. Maneuvering at the dock is assisted by a 500-hp bowthruster and two 360-degree azimuthing Z-drives, each powered by a 500-hp D.C. motor. Propulsion and ship's service power are provided by four 1,500-kW Caterpillar 3516 diesel generators. Another Hilton/Trinity gaming boat, nearly identical to the *Queen of New Orleans*, is about 95 percent complete at TMG's Halter Marine Inc. in Lockport, La. Construction was suspended pending referendum on gaming in other states.

For more information on Trinity
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USCG Proposes Three Lightering Zones In The Gulf Of Mexico

The U.S. Coast Guard proposed to designate three lightering zones in the Gulf of Mexico to allow lightering (offloading) of oil from large tankers onto smaller tankers for delivery ashore. The zones will be at least 60 miles offshore. Weather, sea state and other restrictions are also proposed for lightering operations within the zones. While any vessels may use the proposed zones, single hull tank vessels, otherwise banned by the Oil Pollution Act of 1990 (OPA 90), will be allowed to offload only within the proposed zones or at a deepwater port. The only deepwater port in the U.S. is the Louisiana Offshore Oil Port (LOOP) located offshore south of Morgan City. All single hull tank vessels of 5,000 gt or more will be banned from operating in U.S. waters, including the lightering zones and deepwater ports, on Jan. 1, 2015. The proposed designation will not affect fishing, recreational or other legitimate uses of the water within the zones. The USCG also proposes to designate three areas containing underwater seamounts, including the ecologically sensitive Flower Garden Banks National Marine Sanctuary, where all lightering would be prohibited; to incorporate the use of recognized industry guidelines; and to require compliance with U.S. work hour limitations for tanker crews.

Lightering is a well established method of transferring imported crude oil from tankers too large for shallow water ports to small tankers that serve refineries ashore. Nearly 25 percent of the U.S.' crude oil imports are delivered this way in the Gulf of Mexico, at a rate of approximately two million barrels per day. The USCG says that the proposed rule, by maintaining tanker availability, offers a potential savings of up to \$500 million a year to the American consumer.

For additional information, contact Lcdr. **Stephen Kantz** at tel: (202) 267-0038 or write to the Commandant (G-MS-A), U.S. Coast Guard Headquarters, 2100 Second St., S.W., Washington, D.C. 20593-0001. Copies may be obtained by contacting the USCG at tel: (202) 267-6740; or fax: (202) 267-4624.

Maritime Reporter/Engineering News

The Megayacht Market Comes Back

by Dan Maniotis, Senior Editor

This time last year, U.S. yacht builders were beaming about the repeal of the 10 percent luxury tax on U.S.-built yachts, but had yet to reap the benefits of the wave of prosperity most felt was coming. This year, most have begun the ride — or at least see it coming.

State of the Industry

The yards we spoke to variously attribute the improvement in their order-books to everything from the luxury tax repeal, to a recovering economy, to individual business practices. But overall, the yards had good things to say when we asked them: How's business?

"Quite a bit busier," said **Randy Rust**, general manager of Westport Shipyards, who estimated he was about 50 percent busier than last year. "Presently we have six 106-

footers under contract and two 90-foot projects being discussed." He said the difference in Westport's orderbook is largely due to its association with Westship of Ft. Lauderdale, Fla., an association accompanied by more of a production oriented building philosophy.

"It's really quite good," said **Greg Tiemann** of Crescent Beach Boat Builders of Seattle. "We launched a 105, sold it, launched a 115 and sold it, another 115 — already sold — and a 112, sold. Also an 80-ft., sold." He said Crescent Beach was working on a 115 right now, which, like a good deal of its boats, is being built on spec.

"There's no question that the market for larger yachts is much better than it was a year ago," said **Mike Kelsey**, chairman of Palmer Johnson in Sturgeon Bay, Wis. He said the major factors behind this were better economic climates world-

wide, and the U.S. in particular. "There has been an increase in the market for large boats over 100 ft. long," said Mr. **Kelsey**.

"It's really quite good ... We launched a 105, sold it, launched a 115 and sold it, another 115 — already sold — and a 112, sold. Also an 80-ft., sold." — **Greg Tiemann, Crescent Beach Boat Builders**

"The industry is still in expansion mode," said **William Smith III** of Trinity Yachts. He said the expansion was most pronounced in vessels of 80 - 130 ft. (24.4 - 39.6 m), which he said Trinity is not particu-

larly involved in — indeed, the last yacht Trinity Yachts delivered was a 72-ft. (22-m) custom sports fisher called *Contigo*. But he said many of the builders of larger yachts were involved in a semi-production style of yacht building, using a lot of the same hull designs or molds. "We do purely custom," he said.

Even so, Mr. **Smith** indicated Trinity was open to the possibility of constructing larger yachts. "We're working on some inquiries," said Mr. **Smith**, among which are a 124-ft. (37.8-m) sport fishing boat and a 128-ft. (39-m) motor yacht. He said that in all, there were about six vessels in the latter stages of negotiations — and although he said Trinity Yachts had not been actively involved in making yachts that size, the capacity of the Trinity Marine Group's 17 yards — which recently constructed a 322 ft. (98 m) vessel — is clearly up to the task. Mr. **Smith**

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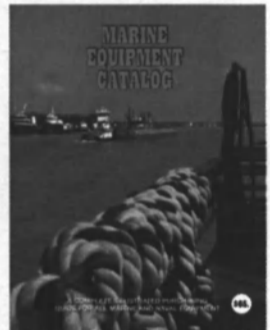
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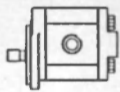
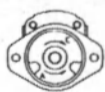
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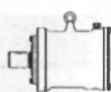
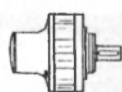
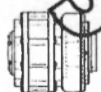


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MEGAYACHT MARKET

also indicated that some technologies Trinity has used in other classes of vessels, including Navy vessels, could make a Trinity yacht unique on the market.

"Business for us is good," **Mark Grimm** of Delta Marine said simply. He said the yard was constructing three displacement-type boats: a 151-ft. (46-m) yacht for delivery in the spring of 1996, a 131-ft. (39.9-m) for spring 1995, and a 117-ft. (35.7-m), also for the spring of 1996. Mr. **Grimm** opined that the luxury tax did not affect the market for larger yachts at all. "I don't think it really affected our market," he said. "The people interested in building these boats are immune to that."

Mr. **Kelsey** of Palmer Johnson, which builds yachts the same size as those by Delta Marine, had similar but not identical sentiments. "We were possibly a little less affected, because our boats take longer to build," he said.

However, whether it was the economy in general or the tax in specific, he did note an order lag a couple of years ago. "It took awhile for the order slump to reflect in production, but it did."

Not only has the U.S. been experiencing significant recovery, said Mr. **Kelsey**, but his yard in particular has seen a healthy amount of business. Palmer Johnson recently completed its largest-ever yacht, *La Baroness*, a 150-ft. (45.7-m) incarnation of **Tom Fexas's** semi-displacement hull, delivered in July 1994. Palmer Johnson will be delivering the Caterpillar-powered, 108-ft. (32.9-m) *Nazenin III* in April 1995. The 122-ft. (37.2-m) *Carolina*, Detroit Diesel-powered, will be delivered in the fall of 1995, and another Cat-powered vessel — this one to exceed the length of *La Baroness* by one foot — is slated for spring 1996 delivery.

The Next Challenge

The challenges are not the same throughout the entire U.S. large yacht industry. It is a diverse market, one that maintains a slippery defiance against definition. "It's hard to quantify as a business," said Palmer Johnson's Mr. **Kelsey**. The large yacht industry is divided by such differences as size, materials (aluminum, steel, fiberglass, composite), building to order or on spec, and custom versus a more series production oriented construction philosophy. And now that the economy is coming back and the Goliath of the luxury tax has been defeated, more attention seems focused on those differences.

The next challenge in this healthier market may not be one the industry faces as a whole: it may simply be, as in any business, for each competitor to capture as much of the market as possible.

"We specialize in one-of-a-kind boats that are custom-designed,"

said Mr. **Kelsey**. That arguably constitutes a sub-market within the large yacht market. "We're as much building works of art as we are making machines that go through the water," said Mr. **Kelsey**.

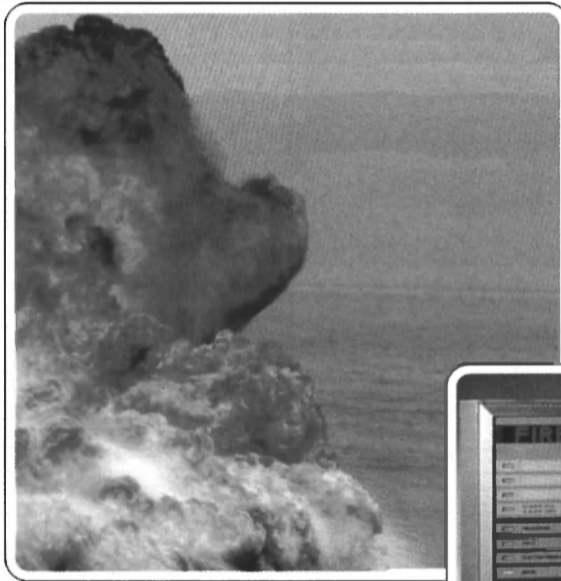
Mr. **Grimm** said Delta Marine

planned to be successful by simply building a good product and then standing behind that product.

"Build a good product and make sure the world knows you're building a good product," is Mr. **Tiemann's** plan. As to the different

specialties builders tend to have, Mr. **Tiemann** defies being pigeonholed. He said all yachts he builds are **Jack Sarin** designs, but some are custom, some not. "We're not locked in with anybody or anything." For other builders, series con-

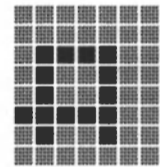
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EUROPEAN YACHT MARKET

Holland & Italy dominate Euro Superyacht scene

By Carol Fulford & Andy Smith, contributing editors

A sign that the worldwide recession has bitten deep and wide can be taken from the relatively dormant state of the European super/megayacht scene.

Confidence does seem to be returning; all the important yards in Holland and Italy have work and the U.K. based designers are busy.

Holland and Italy dominate the stage. The demise of Brooke Yachts in the U.K. soon after the completion of *Stefaren* seemed to signal the end of an era, although the recent fire at Pendennis Shipyard set back an otherwise encouraging attempt at recovery.

The largest British motor yacht currently available is a mere 66 ft. (20 m), although Sunseeker has announced a 77-ft. (23.6-m) model for early 1996. Germany has a number of quality yards involved in the field, most notably Abeking & Rasmussen and Lurssen, but the numbers are small, and this

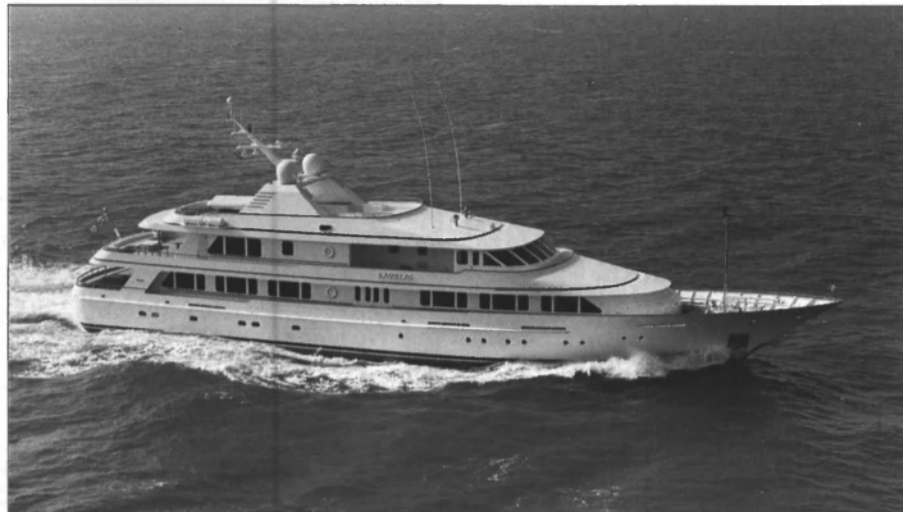
country's most valuable contribution to the market appears to be in the field of high power marine diesel engines.

The French concentrate mainly on sailing yachts and Greek builders attempt to serve only the home market for tax reasons.

The status of the Dutch custom yacht industry is outstanding. Historically a maritime nation, it faced high wage levels when, in the early seventies, other yacht building countries were turning to volume production, against which most Dutch builders found it impossible to compete.

Instead they opted for a high quality custom strategy, last year increasing Holland's share to nearly 30 percent of the 100-ft. (30-m) or over luxury yachts.

Feadship (First Export Association of Dutch Shipbuilders) is a consortium of two family run yards and a naval architectural practice spe-



Feadship's *Rasselas*.

cializing in steel and aluminum superyachts with capacity to build vessels up to 328 ft. (100 m). Around five Feadships are launched each year, and 1994's collection included the 167-ft. (51-m) *Double Haven*, the 156-ft. (47.5-m) *Tatasu* and the 154-ft. (47-m) *Yemaja*.

Feadship's success lies in its ability to combine superior naval architecture with the very latest in technology, materials and craftsmanship.

An example of this is the 171 ft. x

30.5 ft. (52 m x 9.3 m) *Rasselas*, where the owner required a modern day yacht incorporating every facility, but with ties to long standing naval tradition.

Naval architect **Frits de Voogt** was required to produce the modern classic.

To a large extent, this has been achieved by the provision of a main deck passageway around the entire vessel — popular on yachts 30 years ago, and a traditional naval touch.

The yacht's classic interior styl-

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ing was designed by **John Munford**.

Rasselas has a maximum speed of 15.4 knots from a pair of Caterpillar 3512 marine diesels, each developing 1,280 bhp at 1,645 rpm. The vessel is currently on her maiden voyage in the Caribbean.

Amels Holland BV was formerly a commercial shipyard, but since converting to super/megayacht construction in 1980 has built nine vessels to considerable critical acclaim. Currently being built is a 246-ft. (75-m) steel hulled motor yacht with both interior and exterior styling by the energetic London-based Terence Disdale design team. The company's most recent launch was *Maupiti*, a diesel electric powered 151-ft. (46-m) expedition superyacht.

Established in 1880, the family run Hakvoort Shipyard stepped up production in 1994 with *Lady Marina* — at 164 ft. (50 m), the company's most ambitious project yet.

Considered to be one of the most significant recent vessels of its type and the undoubted star of last year's Super Yacht Show in Nice, much has been written about the elegance of the design by **Don Starkey** and the standard of workmanship by Hakvoort.

Lady Marina's owner wanted an aft engine room allowing guest accommodation to be located in the center of the vessel, putting as much distance as possible between sleeping guests and machinery. This demand provided a challenge to naval architects, Diana Yacht Design International, as concentrating the weight aft in a displacement craft would increase the tendency to pitch in heavy seas. This weight distribution problem would normally be compounded by the inclusion of heavy V-drive gearboxes. In fact, these were avoided by the development by Diana of aft hull sections permitting short straight drive trains with only slightly more down angle than normal.

This allowed the full power from twin 1,361-bhp Caterpillar 3512TA diesels to be transmitted to the five-bladed Lips propellers resulting in a maximum speed of 16 knots.

Oceanco, the Monaco based design, build and marketing company, used the Hakvoort/Don Starkey combination to complete *Caprice*, a 123-ft. (37.5-m) MWM powered, 21-knot sports yacht. In the meantime, the company bought the Kees Cornelissen Shipyard in Holland where the 163-ft. (49.8-m) *Achiever* was finished. Designed by the late **Gerhard Gilgenast**, *Achiever* employs a pair of 1,530-hp MTU diesels to give a 17-knot top speed. The company reports that three more vessels are under construction at its newly acquired facility.

Italian superyacht builders are striving hard to recapture the halcyon days of the 1970s when they could command almost 40 percent of the market. With a pickup in the

economy, and aware that many buyers prefer not to wait two years or more for delivery, leading Italian yards are pioneering the building of superyachts "on spec."

Carp Navi - W de Vries Lentsch has a 115-ft. (35-m) motoryacht avail-

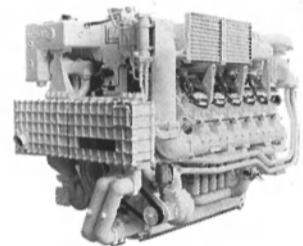
able for immediate delivery, a 100-ft. (30-m) version under construction, and plans for a new 131-ft. (40-m) design. The yard's in-house designs are similar, featuring a steel hull, light aluminum superstructure and conventional propulsion

systems with MWM Deutz diesels. In many ways they tend, as a 16-knot craft should, toward the classic rather than modern school — with vertical windows, open deck space and a high bow with a pronounced bulb for stability.

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One of the two 115-ft. (35-m) vessels currently under construction at Baglietto has been sold and should be ready for delivery in May while work continues on the other. One hundred-ft. (30-m) and 125-ft. (38-m) versions are also being built, awaiting customers. All these motor yachts are built entirely of aluminum alloy in more typical Italian streamlined style and use MTU engines of various powers to produce

speeds in the region of 30 knots. Interestingly, one of Baglietto's most recent deliveries was *Opus* (featured on this month's cover), a 93-ft. (28.3-m) KaMeWa waterjet propelled craft with a maximum speed approaching 50 knots. This craft has all the looks and excitement of an offshore raceboat but with a megayacht style interior. Cantieri Navali San Lorenzo in the charming port of Viareggio now has a five boat range,

all in fiberglass with wood interiors and in the 30+ knots category, which starts at 57 ft. (17.4 m) but will, with the first launch scheduled to take place this month, be crowned by a 100 ft. model. *Blue Velvet*, a 102-ft. (31-m) Frank Mulder design is a recent launch from near neighbor Codesca. Two 3,480-hp MTU diesels drive waterjets through ZF gears to provide the 42-knot top speed.

Union Disputes MarAd's APL Flag-Out Approval

The government's approval of an American President Lines (APL) plan to operate six new containerships under foreign flags instead of under the American flag was challenged in court by the three unions that make up the Seafarers International Union Pacific District (SIU).

The lawsuit of the Sailors' Union of the Pacific, the Marine Firemen's Union and the Seafarers International Union—Atlantic, Gulf, Lakes and Inland Waters districts, charged that the decision of the Department of Transportation's Maritime Administration (MarAd) to allow APL to operate its new vessels, known as C-11s, under foreign flag was arbitrary, capricious, an abuse of discretion, contrary to law and regulation, predicated on insufficient findings, made without due process of law and represented an act beyond the scope of the agency's powers.

The unions' lawsuit stems from the November 15, 1994 MarAd approval of an APL request for a waiver of the provisions of Section 804(a) of the Merchant Marine Act of 1936 concerning the six ships which will be delivered to the company in the near future. Section 804(a) prohibits an American ship owner receiving operating differential subsidy (ODS) from operating a foreign-flag vessel in competition with American-flag ships in the same service. Currently, APL receives ODS for each of its 19 ships. Filed in the U.S. District Court for the District of Columbia, the lawsuit seeks a court order declaring the waiver granted to APL to be null and void.

The plaintiff unions, which represent unlicensed crewmembers on APL vessels, argued that by allowing APL to operate new foreign-flag C-11s as replacements for its vessels currently operating in the U.S. trades, MarAd ignored the intent of the Merchant Marine Act of 1936. "Section 804 was not intended to allow APL foreign-flag vessels to compete directly with APL U.S.-flag vessels on taxpayer subsidized routes," charged the unions. "It is anathema to the entire premise of the Act that a subsidized U.S.-flag operator would be given permission to operate foreign-flag vessels on an essential service not only in direct competition with its subsidized U.S.-flag fleet, but also to replace those taxpayer subsidized vessels, and crews, with foreign vessels and foreign crews," the lawsuit states.

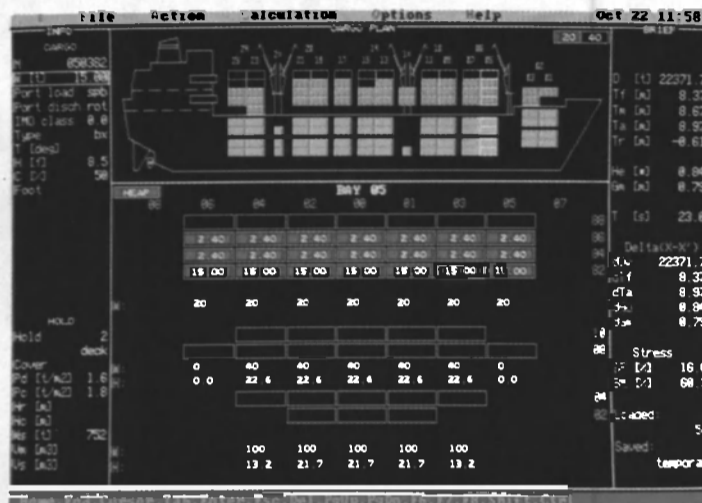
The SIU lawsuit also challenged MarAd's position that the waiver should be granted expeditiously in order to ensure that the vessels are available to the U.S. in times of national emergency.

The unions said this amounted to a delusion as "governments of foreign-flag vessels may prohibit their use in an actual national emergency, and foreign crews have no allegiance to the U.S. that would suggest their willingness to put themselves in harm's way in defense of, to them, a foreign country."

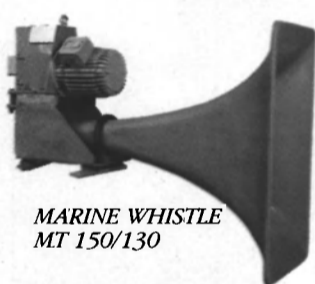
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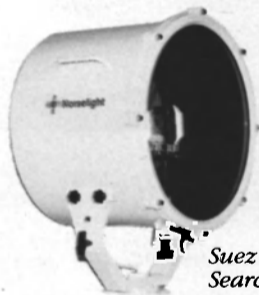
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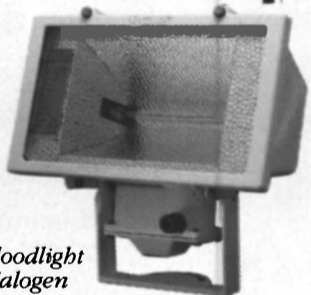
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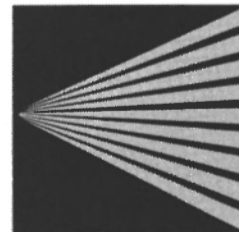
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Marine Coatings & Corrosion Control

New IMO Coating Rule Distributes Responsibility Among Owners, Coatings Manufacturers And Shipbuilders

In its 63rd session, the International Maritime Organization's (IMO) Maritime Safety Committee approved draft amendments to the International Convention for Safety of Life at Sea (SOLAS), 1974, by adding a new regulation (II-1/14-1) requiring corrosion prevention systems be fitted in dedicated seawater ballast tanks of new bulk carriers and oil tankers.

Dubbed the "Guideline for the Selection, Application and Maintenance and Management of Corrosion Prevention Systems of Dedicated Seawater Ballast Tanks," the guidelines were put on a set of SOLAS amendments proposed to enter into force in 1999.

As stated in the text of the new regulations, the guidelines do not intend to replace the technical as-

pects of any specific coating system — to be covered by the product and job specifications — which are at the discretion and under the responsibility of ship owners, manufacturers and shipyards.

It does however require the owner to select and maintain a system to ensure adequate levels of corrosion protection; the coatings manufacturers to give evidence of the quality of the product and its ability to satisfy the owner's requirements; and the shipyard/subcontractors to provide evidence of its experience in coating application.

In general, the lifetime of a coating applied to a new construction may be influenced by several factors, including coating selection, application and maintenance.

The new IMO rules point out that the use of hard coating is the most

common today, the effectiveness depending on the adherence and careful following of the manufacturer's technical product data sheet and job specification.

Multi-coat treatments with coating layers of contrasting colors are recommended, and the rules state that the last layer should be a light color to facilitate in-service inspection.

Coating performance can be improved, the regulations state, by adopting measures at the design stage such as the reduction of scallops, the use of rolled profiles and ensuring that the structural configuration permits easy access with tools and facilitates cleaning, drainage and drying of tanks.

It's also important to ensure a coating is compatible with the cathodic protection system when a

coating is supplemented with that system.

PRODUCT SELECTION

The rules recommend using a coatings manufacturer with documented satisfactory performance records; technical data sheets; and the ability to render technical assistance. For products without satisfactory performance records, the coating selection should have test data carried out in accordance with recognized standards which verifies its suitability to service conditions, e.g. immersion, accelerated hot salt spray and adhesion tests.

Coatings for application underneath sun-heated decks or on bulkhead forming boundaries of heated cargo spaces should be able to withstand constant or repeated heating without becoming brittle. Also, regard should be given to the possible poor edge covering properties of hard coatings with a high solid content, the document states.

SURFACE PREPARATION

In general, surface preparation of appropriate methods should be in accordance with the coating manufacturer's specification and

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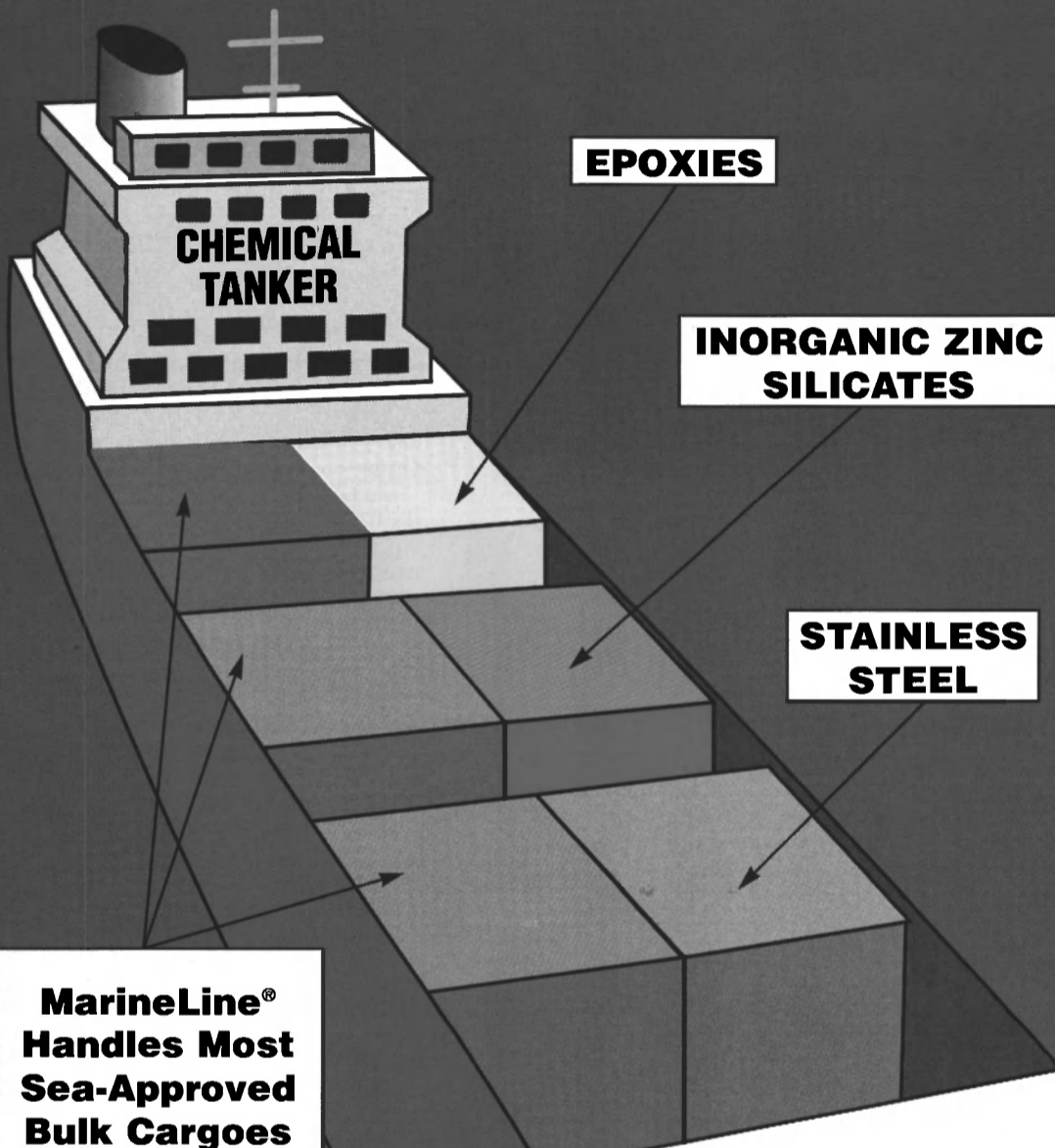


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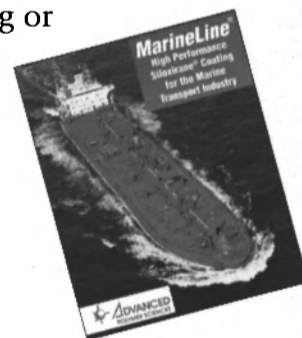
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requirements, with the actual sequence of preparation and application dependant on the standard selected.

The regulation states that a steel surface should be prepared so that the coating can be evenly distributed at the required dry film thick-

ness, and have an adequate adhesion by removing sharp edges, grinding weld beads and removing weld spatter or any other surface contaminants. Cleaning to near white metal or equivalent may be carried out either on incoming materials (plates and profiles) immediately

before the ship-primer application, or after completion of tanks before the application of the primer coating.

If blast cleaning techniques are used after completion of tanks, the conditions under which blast cleaning is carried out should preclude

condensation, and it is not recommended to carry out blasting when: the relative humidity is above 85 percent; the surface temperature of steel is less than three degrees C above the dew point; or there is any possibility that the surface of the steel is wet, or there are traces of moisture, or condensation occurs before the primer coat is applied. The regulation also points out that blasting abrasives and dust should be completely removed via a vacuum cleaning, compressed air and brushes after the job is finished. And the abrasive used should be dry and free from dirt, oil, grease, chlorides and suitable for producing the standard of cleanliness and profile specified by the manufacturer.

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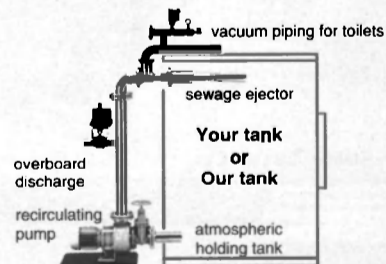
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APPLICATION

Application of coatings should be well-planned and integrated in the shipyard's construction plans, and carried out under controlled conditions.

Areas where the shop-primer is damaged in any way may be touched up in accordance with the manufacturer's specification. Each coating layer should have the maximum/minimum thicknesses in accordance with the coating specification. An 80/20 practice may be adopted, which means that 80 percent of all thickness measurements should be greater than or equal to the nominal dry film thickness (DFT), and none of the remaining 20 percent is below 80 percent of the DFT.

Care should be taken to avoid increasing the thickness in an exaggerated way. Excessive thickness can lead to dangerous consequences, such as solvent and thinner retention, film cracks, gas pockets, etc. Wet coating thickness should be checked during application.

Each coating layer should be adequately cured before application of the next coat, in accordance with coating manufacturer's recommendations. Job specifications should include the dry-to-recoat times given by the manufacturer. Another key factor to proper curing is ventilation, which should be maintained throughout the application process and for a period after the application is completed, as recommended by the coating manufacturer.

Finally, dry film thickness tests should be carried out after each coat, not just at the end of the coating applications, by using the appropriate thickness gauges.

Inspection relevant to surface preparation and coating application should be agreed upon between the ship owner and the shipyard under the manufacturer's advice. Clear evidence of all of the above-mentioned inspection should be reported in an agreed format.

These reports should be at the disposal of all interested parties, including the administration or an organization recognized by the administration.

Marine Coatings & Corrosion Control

Any defective areas noted at inspection (e.g. pin holes, bubbles, voids) should be marked up and appropriate repairs should be carried out. All repairs should be re-checked for any uncoated areas.

CATHODIC PROTECTION

Cathodic protection is a way of protecting a steel surface from corrosion by installing sacrificial anodes, in contact with the steel in the electrochemical seawater corrosion cell. These systems can be used in combination with coating systems to prevent or reduce pitting corrosion starting from local defects in the coatings.

The anodes should be designed in terms of size, weight and distribution to give an adequate life commensurate with the service period. Anode distribution, type, weight and dimension should be shown in relevant documents and be available for maintenance purposes.

Having chosen the number and size of anodes, they should be distributed evenly over all the structure with some emphasis on horizontal surfaces likely to retain water and, in particular, they should be installed close to the bottom plates of tanks which are seldom completely dry.

Cathodic protection is without effect when the tank is empty, and it requires some time (a day or more) to become effective after the tank has been filled.

When choosing cathodic protection, consider: tank size, shape and area protected; extent and location of coated and uncoated surfaces; frequency of ballasting/deballasting operations, including percentage of time the tank is filled and the level of filling; and the resistivity of water, its temperature, etc.

MAINTENANCE

Maintenance of the corrosion prevention system should be included in the ship's overall maintenance plan.

The most efficient way to preserve the corrosion prevention system is to repair any defects found during the in-service inspection, defects such as spot rusting, local breakdowns at edges or stiffeners, etc.

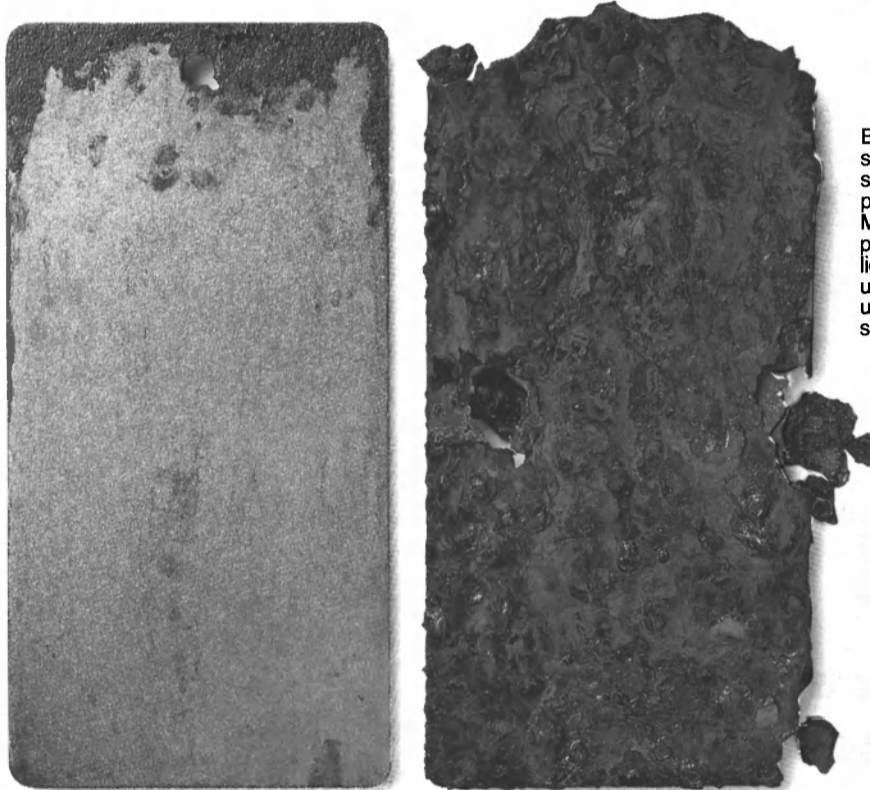
Re-coating should be carried out in accordance with the manufacturer's specifications. A type of hard coating compatible with the one used for construction should be applied, and the compatibility should be checked by the owner and the manufacturer involved in the re-coating operation.

If the required conditions for the application of the original coating are not achievable, a coating more tolerant of a lower quality of surface treatment, humidity and temperature conditions, may be considered, provided that it is applied and maintained in accordance with the manufacturer's specifications.

The following is a compilation of new products and services offerings from a wide variety of companies involved in all aspects of Marine Coatings & Corrosion Control. For additional information on a particular company, circle the corresponding number on the Reader Service Card in this issue.

Advanced Polymer Sciences

Advanced Polymer Sciences offers SteamLine, a siloxirane polymer to resist the thermal extremes of high heat of steam pipes with continue spraying of cold salt water;



Both steel plates were subjected to a 1300-hour salt-spray test. The plate protected with MAGNAKOTE PLUS rust preventative shows only light surface rust at the untreated top edge. The unprotected plate shows severe steel loss.

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MAGNAKOTE rust preventatives: Your ship's best protection against its worst enemy.



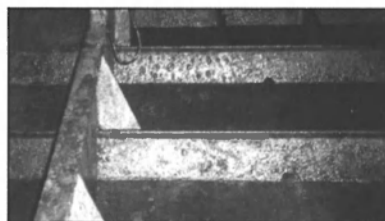
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MAGNAKOTE PLUS rust preventative can be applied over rusted surfaces as well as new steel to remove existing rust and protect steel from further corrosion.



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Marine Coatings & Corrosion Control

MarineLine Chemical Cargo Tank Coating, manufactured from siloxirane patented aerospace polymers, which is reportedly resistant to all chemicals transported in the maritime trade; and StackLine, a high temperature (500 degrees F/260 degree C) coating for internal and external protection of stacks.

For more information from
Advanced Polymer Sciences
Circle 87 on Reader Service Card

Aqua-Dyne

Aqua-Dyne's Roto-Jet blaster ship cleaning system (patent pending) is a self-powered high-pressure waterjet unit for surface preparation of the hull or deck of a ship. The water jetting system automatically cleans loose paint, rust and scales to meet the SA 2-3 standard. The cleaning unit is lowered down the ship's hull to the bottom, moved

sideways using on-deck rigging, and then brought back up to the deck while cleaning a 3-ft. (1-m) path with each up and down pass. The manufacturer said the Roto-Jet blaster cleans up to 70-sq.-m of area per hour, and a variety of surface preparation results can be obtained by varying the nozzle rotating speed and the output of the high pressure pump.

For more information from Aqua-Dyne
Circle 67 on Reader Service Card

Corrosion Technology Corp.

Corrosion Technology Corp. manufactures Corrosion X Marine, a fluid thin film coating (FTFC) which keeps corrosion from starting and stops corrosion where it starts by displacing moisture to provide protection, according to the manufacturer. When applied

to existing corrosion, Corrosion X Marine penetrates deeply into the corrosion cell where it displaces electrolytes and lays down an ultra-thin, dielectric barrier that helps stop electrolysis. It can be applied directly to electric motors, switches, rheostats, generators, coils, solenoids, connectors, etc.

For more information on
Corrosion X Marine
Circle 88 on Reader Service Card

Devoe Coatings Co.

Devoe Coatings Co. manufactures high-performance paint and coatings for exterior hulls, topsides and ballast and cargo tanks. The company also provides a complete line of tank linings for a wide range of chemical resistance. The company's DevChem 257 is an advanced technology

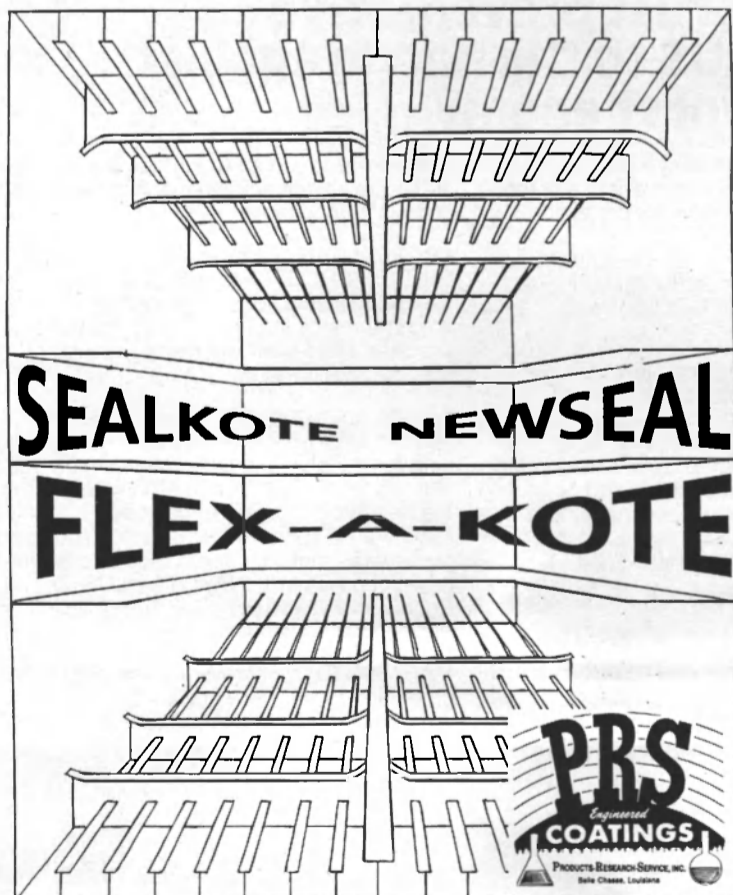
epoxy chemical-resistant tank lining with reportedly exceptional resistance to a wide range of chemicals and solvents.

For more information from
Devoe Coatings
Circle 69 on Reader Service Card

Drew Ameroid Marine

Magnakote Plus rust preventative, Drew Ameroid Marine's most recent corrosion control innovation, provides five years of protection for ships' ballast tanks and void spaces, while the original Magnakote treatment is warranted for two years. A technical brochure from Drew discusses the company's comprehensive corrosion control program for optimizing the cost and protection benefits of both Magnakote solutions to the age-old problem of rust. Drew's "ship preserver" system incorporates regu-

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Marine Coatings & Corrosion Control

lar use of Drew's MUD Conditioner ballast tank water treatment for reducing the mud and silt accumulation in ballast tanks that can contribute to corrosion conditions, and higher doses with agitation for removal of existing accumulations. Both Magnakote Plus and Magnakote rust preventatives are warranted under Drew's Life Preserve Program, which provides both pre-application and follow-up shipboard inspections at no additional costs.

For more information from Drew
Circle 70 on Reader Service Card

E Paint Company

E Paint Co. introduced two antifouling paints which the company said offers an environmentally safe, yet totally effective antifouling coating. E Paint Co., a division of the Cape Cod Research Inc., a coating research lab, introduced the product for testing nine years ago. After hundreds of tests, the patented results are: No Foul-ZDF and No Foul-WB, which are copper and tin-free antifouling paints which offer antifouling protection comparable to traditional copper-based antifouling paints, but reportedly avoid many environmental problems. No Foul-ZDF is a solvent-borne, general purpose bottom paint that is also self-polishing. No Foul-WB is a two-part epoxy coating presenting a hard, peroxide-rich surface to colonizing organisms, thereby defeating their attachment.

For more information from E Paint Co.
Circle 71 on Reader Service Card

Esgard

Recent changes in the Det Norske Veritas (DNV) type approval program have qualified Esgard Bio Kote as a semi-hard, non-paint ballast tank preservative, which when used as directed, exempts coated tanks from annual survey requirements. Requirements for recognition by DNV included: successful completion of the Marintek wave cycle and condensation tests, light color, application via spray, defined surface preparation and application standards and published inspection and reapplication intervals. Bio Kote is formulated by Esgard, Inc., and marketed worldwide in conjunction with Esgard Intl. GmbH.

For more information from Esgard
Circle 89 on Reader Service Card

Ferro Corp.

The cordobond strong-back epoxy resin system is a two-part component, consisting of resin and activator. The core material is abrasion and corrosion resistant. It adheres to most surfaces including steel, plastics, wood and ceramics.

For more information from Ferro Corp.
Circle 90 on Reader Service Card

Gougeon Brothers

Gougeon Brothers, Inc. manufactures the Pro-Set line of epoxy products — laminating epoxies which offer long open times and can be used in female-mold composite construc-

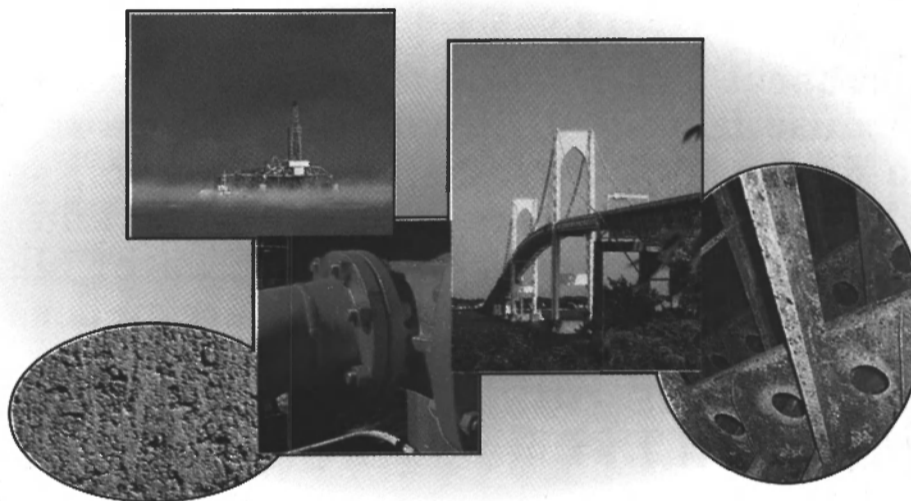
tion. Pro-Set epoxy, according to the manufacturer, is more flexible and fatigue resistant than polyester, and does not shrink. It also is low in VOCs, to help builders meet government regulations.

For more information from Gougeon
Circle 72 on Reader Service Card

Graco

Graco's new cart-mounted premier pump is designed for jobs requiring long hose lines, multiple guns and large tip sizes. The pump is capable of spraying everything from zinc-

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With Pre-Prime 167 Sealer, millions of square feet of concrete and rusty steel have been upgraded without blasting.

Pre-Prime 167 100% Solids Rust Penetrating Sealer works where other solvent-based surface tolerant coatings can't—on rusty steel, concrete, and many aged coatings systems.

Pre-Prime 167 Sealer is water thin. Its low viscosity maximizes penetration, wetting, and capillary action. One thin wet coat at 1.5 mils (38 microns) will seep deep into tight rust and wick beneath.

Water-thin viscosity allows it to wet deep into and behind rust; 100% solids deters trapped solvents. It makes hand-cleaned steel into a stable surface ready for coating, providing a cost effective alternative to maintenance blasting.

Pre-Prime 167 Sealer primes and protects concrete. Its water-like viscosity allows it to penetrate deep into the porous concrete surface. It becomes an integral part of the

concrete, seals the surface, and forms a strong foundation for overcoating. Used alone, Pre-Prime 167 Sealer strengthens and seals the concrete, and with the proper top coat, provides resistance to water, oil, gasoline, diesel, and mild chemical exposures.

On aged coatings, Pre-Prime 167 Sealer seals loose edges, crevices, back-to-back angles, and surface imperfections. The low film build eliminates the risk of applying excessively thick films over aged coatings, alleviating shrinkage and curing stresses, and deterring delamination.

For ballast tanks in marine applications, a high pressure water wash followed by Pre-Prime 167 Sealer and a coat of Devran 230® High Build Epoxy Coating or Bar-Rust 235™ Multi-Purpose Epoxy Coating provides superior corrosion protection and chemical resistance.

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Corroseal, Inc.

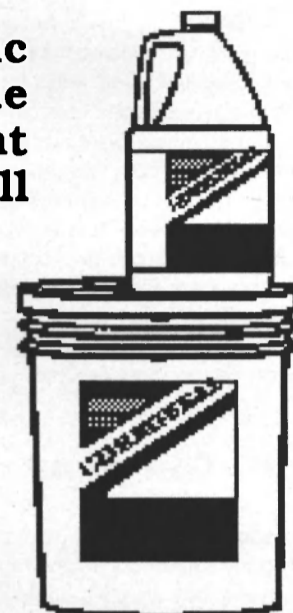
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52 Gallon Fiber Drum

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Non Flammable
VOC Compliant
Pleasant Smell



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Corroseal™ is a favorite of vessel crews and masters because it works! It will do what we say it will do! Widely used on decks, dbf bottoms, ballast tanks, steering compartments, bilges, chain lockers, shaft tunnels and houses. Ideal for use after machine tool cleaning or water blasting because it gets the rust. No toxic inhibitors are necessary. No white streaks!

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Marine Coatings & Corrosion Control

rich primers to epoxy mastics. It provides pressures up to 4,500 psi and flow delivery up to 6.9 gpm. It is designed to eliminate performance fall-off or stoppage due to ice build-up.

**For more information from Graco
Circle 91 on Reader Service Card**

Hempel Coatings (USA), Inc.

The Hempel group has grown from a single production unit in Copenhagen in 1915 to become one of the largest independent suppliers of marine coatings in the world, operating 26 factories and a global distribution network. Hempel has invested vast sums in development of user and environmental friendly coatings, such as: tin-free antifouling, including self-polishing; water-borne anticorrosives; surface tolerant - low V.O.C. - anticorrosives; and more. Hempel's new ballast tank coatings are Hempadur 4514 and Hempadur 1708. Based on epoxy materials, the systems fulfill the requirements of leading classification sources for being a "hard coating."

**For more information from Hempel
Circle 77 on Reader Service Card**

Jotun Valspar Marine Coatings

According to Jotun Valspar, it was one of the first manufacturers to recognize the special corrosion problems in ballast tanks, and it started early in its developments of a coatings solution which superseded traditional solutions. The new product needed to avoid, for example, deficiencies in coal-tar coatings. The Jotun R&D program "Balloxy HB Light" offers shipowners facing the ballast tank problem a solution, as it reportedly combines high performance, easy application and long-term savings in maintenance costs. Balloxy HB Light is a modified epoxy coating with reported excellent wetting properties on steel surfaces. Wintergrade Balloxy HB Light, the cold-weather version of this Jotun treatment, is available for application and curing temperatures down to -5°C.

**For more information from Jotun Valspar
Circle 76 on Reader Service Card**

Mid Atlantic Diving Contractors

Mid Atlantic Diving Contractors specializes in corrosion protection and rehabilitation of marine structures and has installed the all-polymer encapsulation (A-P-E) process on numerous projects in the U.S. and abroad. The company recently completed a contract with Stingray Pipeline Co. for corrosion protection of offshore risers using the A-P-E process.

**For more information on
Mid Atlantic Diving Contractors
Circle 92 on Reader Service Card**

Product Research Services

Product Research Services, for more than 46 years, has manufactured for and served the marine, offshore, industrial and petro-

chemical markets. The P.R.S. product line includes alkyds, epoxies, phenolics, vinyls, polyurethanes, zinc rich and antifouling; all manufactured to meet environmental concerns.

**For more information on P.R.S. products
Circle 93 on Reader Service Card**

Progressive Products, Inc.

Progressive Products Inc. is a distributor of IFT, premium grade, industrial, solvent-free epoxy coatings. These two-part epoxies are

Circle 287 on Reader Service Card

Marine Coatings & Corrosion Control

used where long life, chemical protection, wear resistance and ability to be applied on wet or underwater surfaces matter. Non-skid versions are available. The coatings are designed to withstand the rigors of chemical facilities, municipal sewers, the petroleum industry and the marine industry.

For more information on Progressive Products
Circle 94 on Reader Service Card

Royal Chemical

Royal Chemical had two of its paint systems — Rust Kote and Easy Kote — type approved under the ABS equipment approval program. Both products are water based asphaltic emulsions that dry to a semi-hard finish. They are both available in either black or grey. Neither require a sandblasted surface, and they are easy to use, according to the manufacturer. Each product is intended for use in salt water ballast tanks. Easy Kote is additionally classified by Underwriters Laboratories Inc. as a drinking water system component in accordance with standard ANSI/NSF 61 1992 for potable water use.

For more information from Royal Chemical
Circle 97 on Reader Service Card

S.G. Pinney & Associates

S.G. Pinney & Associates, Inc. specializes in corrosion control with protective coatings. Founded in 1977, the company maintains offices in 10 U.S. and Canadian cities

and has affiliates in the Middle East, Europe and Japan. Services include condition surveys, specification preparation and review, coatings testing and selection, failure analysis, surface preparation application and inspection and training seminars.

For more information on S.G. Pinney & Associates
Circle 96 on Reader Service Card

Target Enterprises

Target Enterprises offers a line of interior and exterior water-based wood coatings for marine applications. The WB2000 system helps achieve the ultra-modern look of a clear coating on exotic wood, while the Oxford Series coating provides the classic color tones of old world varnish. Target said its exclusive waterborne urethane formulations hold many advantages in terms of drying, scratch resistance and protection from environmental changes.

For more information from Target Enterprises
Circle 95 on Reader Service Card

U.S. Paint

The company announced the publication of the AWLGRIP Marine Applications Guide's 11th edition. Past guides were recognized by naval architects and professional applicators as an industry standard, according to the company. Additions to content are the result of extensive field surveys soliciting recommendations from professional

AWLGRIP users and are qualified by U.S. Paint laboratory testing. Also, the company announced that AWLGRIP's AWLSTAR Gold Label antifouling is now available in white, reportedly a breakthrough for a non-tin containing copolymer.

For more information from U.S. Paint
Circle 98 on Reader Service Card

Unitor Ship Service Inc.

For corrosion control and protection in ballast tanks, cargo holds, deck areas and superstructures, Unitor offers Corroless Rustkiller anti-corrosion coatings and Corroshield ballast tank systems for long-term protection.

Corroless Rustkiller is reportedly an easy to use range consisting of single pack alkyd and twin pack epoxy primers plus aerosol sprays for electrical junction boxes and hard to reach areas. Corroshield FC24 and Corroshield SC60 provide a flexible, cost effective solution to the problem of ballast tank corrosion.

For more information from Unitor
Circle 68 on Reader Service Card

Corroseal, Inc.

Corroseal, Inc. produces Corroseal™, which reportedly converts rust to an inert substance called magnetite. At the same time the product polymerprimes the metal for top coating. When Corroseal is applied to clean, light rust it reportedly creates an effective barrier layer. The product is VOC compliant at 1.8 lbs. per gallon, non-flammable, and, according to the manufacturer, has no offensive odor and mild pH of 3-4.

For more information on Corroseal
Circle 104 on Reader Service Card

Cygnus Instruments, Inc.

Cygnus Multiple Echo ultrasonic digital thickness gauges are able to ascertain the thickness of metal without removing the coating. The gauges are reportedly easy to use and durable for gauging shell plate, bulkheads, ballast tanks, cargo lines, steamlines, etc. Cygnus gauges are also used for classification society inspections.

For more information on Cygnus
Circle 105 on Reader Service Card

ITW Philadelphia Resins

ITW Philadelphia Resins manufactures a complete line of marine checking compounds, repair products and coatings. Chocking compounds are used under engines and deck equipment as well as for stern tubes. Coatings include rust inhibitive primer, urethane and epoxy non-skids, color topings and protective shaft coating.

For more information on ITW Philadelphia Resins
Circle 112 on Reader Service Card

Sigma Coatings

Sigma Coatings has a diverse product range as well as innovations in areas such as ecologically friendly antifouling, solvent-free tank coatings, and tar-free epoxies for use in ballast tanks. Sigma relies on current coating technology to apply paint, which is tested under simulated conditions before application. Sigma EP Multiguard, Sigma EP Multimastic and Sigmaguard CSF tank coating are three products, according to the manufacturer, that are at the forefront of current vessel upgrading trends.

For more information on Sigma
Circle 113 on Reader Service Card



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BV Follows Up On Coming IMO Resolution

In May of 1994 the International Maritime Organization (IMO) Safety Committee approved a new resolution on Corrosion Protection Systems for dedicated sea water ballast tanks on all tankers and bulkers.

The new resolution tackles the major structural failures at source for focusing on a correct coating suitable for a lasting corrosion protection at the construction stage.

To be put into effect, this resolution requires the contributions from all parties concerned with the building of new vessels: shipyards, coating manufacturers and applicators, shipowners and classification societies.

In conjunction with its mission of promoting and implementing Safety of Life at Sea, Bureau Veritas (BV) sought to assist the industry with the preparation of a draft Guidance Note on corrosion of ship structures and with the much needed training of paint inspectors.

In this respect, an agreement was entered into with the Norwegian National Institute of Technology to deliver the FROSIO approved course.

FROSIO is the reputed Norwegian Council for Education and Certification of Paint Inspectors founded in 1986. More than 500 inspectors were certified by FROSIO as of De-

cember 1994.

For the first time the course was given outside of Europe, taking place in Pusan, Korea from Nov. 21 to Dec. 2, 1994. The course was attended by 25 participants from nine countries.

The course meets the requirements of the Norwegian Standards NS 476 "Rules for Approval of Surface Treatment Inspectors."

For more information on BV
Circle 66 on Reader Service Card

Avondale Awarded \$13.8 Million Drydock And Repair Contract

Avondale Industries, Inc. was awarded a \$13.8 million contract for the drydock and repairs to two TAKR-Fast Sealift Ships for Bay Ship Management Inc. This work will be performed on the USNS *Bellatrix* (TAKR-288) and the USNS *Antares* (TAKR-294) at the company's main shipyard facility and will be completed by September 1995. These are two of eight high-speed ships operated for the Military Sealift Command to provide RoRo handling and storage facilities. This contract was the third of its type awarded to Avondale during 1994.

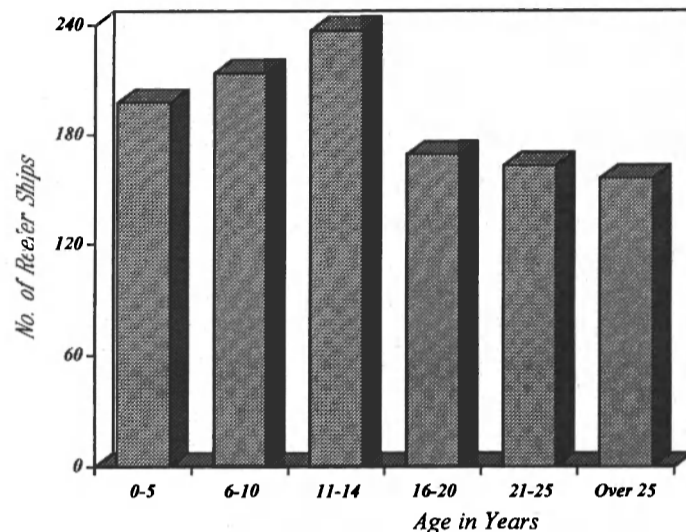
For more information on Avondale
Circle 28 on Reader Service Card

INDUSTRY TRENDS

by

James R. McCaul, President
IMA Associates, Inc.

28 percent of the world inventory of reefer ships is over 20 years of age — and many of the older ships will need to be replaced over the next five years. Construction of reefer ships will provide an opportunity for advanced shipyards and equipment suppliers.



Source: IMA Associates, *Shipbuilding Industry Outlook*, 1995 Edition

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Does The U.S. Need Cargo Preference Laws?

GAO Report Examines The Pros And Cons

The General Accounting Office (GAO) recently released a report examining the benefits and costs of maintaining the U.S.'s cargo preference programs, which reserve certain portions of certain cargoes for U.S.-flag vessels. Following are excerpts from the Executive Summary of the report.

Background

The primary cargo preference laws in effect today are (1) the Cargo Preference Act of 1904, which generally requires that only U.S.-flag vessels be used to transport supplies by sea for the U.S. armed forces and (2) the Merchant Marine Act of 1936, as amended by the Cargo Preference Act of 1954, which generally requires that at least 50 percent of any government-controlled cargo shipped by sea be carried on privately owned U.S.-flag vessels.

In 1985, the Merchant Marine Act of 1936 was amended to require that 75 percent of certain foreign food aid be shipped on privately owned U.S.-flag vessels. The Maritime Administration (MarAd) reports that the privately owned U.S. oceangoing commercial fleet is the ninth largest in the world by deadweight tonnage, constituting about three percent of the world fleet's tonnage. The U.S. fleet consists of about 371 U.S.-flag merchant vessels of 1,000 gt and over. MarAd reported that of the 371 vessels, 23 were inactive, 49 were chartered by the Department of Defense (DoD), 134 were engaged in domestic trade, and 165 were engaged in international trade. The 165 vessels in international trade are the vessels that carry preference cargo.

Results In Brief

Cargo preference laws increased federal agencies' transportation costs by an estimated \$578 million per year for fiscal years 1989 through 1993 because U.S.-flag vessels generally charge more to carry cargo than their foreign-flag vessel counterparts. The average is about \$710 million per year when the costs associated with the Persian Gulf War are included. Four federal agencies — DoD, the Department of Agriculture (USDA), the Agency for International Development (AID), and the Department of Energy (DOE) — are responsible for more than 99 percent of preference cargo, by tonnage.

The effect of cargo preference

laws on the U.S. merchant marine industry is mixed. On one hand, the share of international oceanborne cargo carried by U.S.-flag vessels has declined despite cargo preference laws. In 1992, for example, about 96 percent of oceanborne cargo was carried aboard foreign-flag vessels. On the other hand, these laws appear to have a substantial impact on the U.S. merchant marine industry by providing incentive for vessels to remain in the U.S. fleet. GAO estimates that without preference cargo, the equivalent of up to two-thirds of the 165 U.S.-flag vessels engaged in international trade, by tonnage, would leave the fleet. Most of the vessels that would leave would either reflag to another country to

GAO estimates that without preference cargo, the equivalent of up to two-thirds of the 165 U.S.-flag vessels engaged in international trade, by tonnage, would leave the fleet.

save costs or cease to operate if they are not competitive. This would directly affect about 6,000 U.S. shipboard jobs.

Principal Findings

Transporting cargo on U.S.-flag vessels is more expensive than doing so on foreign-flag vessels largely because the former are required to be crewed by U.S. mariners, who generally receive higher wages and other benefits and have higher manning-level requirements than comparable foreign-flag vessels. In addition, U.S.-flag vessels are generally required to be built, and encouraged to be maintained and repaired, in U.S. shipyards, which generally charge more than foreign shipyards. These costs are passed on to federal agencies when they use U.S.-flag vessels to ship international cargo. For example, for fiscal years 1989-1993, DoD estimates that the additional transportation costs of the preference cargo it shipped on U.S.-flag vessels averaged about \$350 million per year. Most of DoD's preference cargo supports troops stationed overseas. The average is about \$482 million per year when the costs associated with the Persian Gulf War are

included. Other agencies that ship large amounts of preference cargo include the USDA, AID and DOE. For fiscal years 1989-1993, USDA and AID report that the additional transportation costs of the preference cargo they shipped on U.S.-flag vessels averaged about \$200 million and \$23 million per year, respectively. Most of their preference cargo is foreign aid. GAO estimates, for fiscal years 1989-1993, that DOE paid, on average, less than \$2 million per year in additional transportation costs to ship oil for the Strategic Petroleum Reserve on U.S.-flag vessels. While U.S.-flag vessels carry only about four percent of all international cargo, the percentage of cargo carried by U.S.-flag vessels that is preference cargo is relatively large — 33 percent in 1992. Thus, although cargo preference laws have not affected the U.S. share of oceanborne cargo, they have a significant impact on the U.S. merchant marine industry. GAO measured this impact by estimating that, in the absence of preference cargo, the equivalent of between 61 and 68 percent, by tonnage, of the 165 U.S.-flag vessels engaged in international trade would leave the U.S.

fleet. Many of the vessels could be competitive in international trade and would leave the U.S. fleet in order to lower their costs. Others would be unable to compete and would cease operating, either being scrapped or laid up. GAO confirmed its results about which vessels would leave the U.S. fleet via a survey of 18 vessel operators that controlled 112 of the 165 vessels engaged in international trade.

Approximately 6,000 mariners are employed aboard vessels that would leave the U.S. fleet in the absence of preference cargo. This represents about 71 percent of the 8,500 shipboard jobs that MarAd reported as being supported by the 165 vessels engaged in international trade. GAO believes that cargo preference laws do not have a significant impact on the number of new ships built in U.S. shipyards because U.S. shipyards delivered only one oceangoing merchant vessel during fiscal years 1988-1993. However, the amount of maintenance and repair work done at U.S. shipyards would likely decrease in the absence of preference cargo. Industry reps whom GAO spoke with generally agreed with this assessment.

Jeffboat, Verrett Shipyard To Build For Blessey

Blessey Marine Service added three barges and two boats to its fleet, bringing the total fleet size to 40 double hull tank barges and 14 towboats. Blessey bought the M/V *Miss Rachel* and renamed it the M/V *Charles W. Clark*. The 1,300-bhp towboat is powered by a pair of Detroit Diesel 8V149TI main engines through Twin Disc MG-520 reduction gears. Verrett Shipyard has also been contracted to build a 1,350-bhp towboat. The newbuilding will be powered by a pair of Detroit Diesel 12V149NA main engines through Twin Disc MG-540 reduction gears. Jeffboat is building the WEB-214B, a 250-ft. (76-m) by 54-ft. (16m) by 13-ft. (4-m), 25,000-bbl hot oil barge for delivery this April. The barge, along with seven others Jeffboat built for Blessey, are equipped with six million-BTU heaters for carrying asphalt. Jeffboat is also building two 30,000-bbl barges to be fitted with vapor recovery for clean chemicals. Delivery is expected in the third quarter of 1995.

Sperry Opens Integrated Bridge Training Facility

Sperry Marine has opened a Vision 2100 Integrated Bridge System (IBS) Training and Demonstration Facility in its Charlottesville, Va. headquarters.

The Vision 2100 IBS includes an entire complement of Sperry Marine equipment.

Further enhancing the Vision 2100 is an integrated engine control, Ocean Systems International's voyage optimization and heavy weather damage prevention system, and Sperry's universal Vision electronic chart format module for both raster scan and vector type chart requirements, including ECS and ECDIS applications. The new facility will offer training on all Vision 2100 equipment and will be available for Vision 2100 demonstrations.

For more information on Sperry
Circle 81 on Reader Service Card

New Lubricant Designed To Be Environmentally Friendly

Chevron Lubricants introduced a new mineral-based, anti-wear hydraulic oil for systems used in marine equipment that reportedly delivers proven environmental benefits and advanced performance. Dubbed Chevron Clarity Hydraulic Oil AW, the product is engineered to protect hydraulic equipment operating under demanding conditions in sensitive natural environments.

According to the manufacturer, the product exceeds Environmental Protection Agency and U.S. Fish and Wildlife Service standards for non-toxicity and is classified inherently biodegradable.

For more information from Chevron
Circle 15 on Reader Service Card

OOCL Signs Long Term Agreement

Ice-strengthened, 2,200-TEU ship to enter St. Lawrence Seaway service in 1996

Orient Overseas Container Line (OOCL) and CP Rail System (CPRS) signed a long-term agreement covering rail distribution and terminal services throughout the railroad's extensive intermodal system. The new agreement took effect with the arrival in Vancouver of the *Oriental Executive* on January 3. OOCL's container vessels provide weekly service between the port of Vancouver and Pacific Rim countries including Hong Kong, China, Japan, Korea and Taiwan. CPRS's role in the through transportation system provided by OOCL will be to provide the inland rail service between the port of Vancouver, western Canadian points and Toronto and Montreal. Included in the OOCL traffic is Landbridge cargo moving between Asia and Europe, with CPRS providing the rail link across Canada, joining OOCL's Asia-Vancouver service with their weekly Montreal-Europe service. OOCL's Vancouver traffic, the largest container volume through that port, had previously been carried by Canadian National. **R.J. Ritchie**, president of CP Rail System, and **C.L. Ting**, president of Orient Overseas Container Line's North American Division, officially signed the agreement in Montreal.

Mr. Ting said: "This agreement will further strengthen the well established business relationship between our two companies. It offers significant synergistic benefits to OOCL in linking its east and west coast Canadian gateway services, and will enable our two companies to explore future opportunities."

OOCL is a long-term customer of CP Rail System through the Port of Montreal, dating back to 1968 when Manchester Liners operated the first containership to call at the port. OOCL became owners of Manchester Liners when OOCL purchased Furness Withy in 1982. OOCL is a partner in the St. Lawrence Coordinated Service operated with Canada Maritime. The *OOCL Assurance* (1,061 TEUs) and the *OOCL Challenge* (1,852 TEUs), within the co-ordinated service, connect Canada and the U.S. eastern and midwest markets with Europe. OOCL ordered a special purpose ice-strengthened ship of 2,200 TEU capacity from a Korean shipyard for delivery in mid-1996. This vessel will join the St. Lawrence Coordinated Service and will be the largest containership of its kind to navigate the St. Lawrence River calling at the Port of Montreal. OOCL is a subsidiary of Orient Overseas (International) Limited, one of the world's largest transport organizations. The shipping company owns or operates 23 containerships.

Litton Awarded \$738.8 M For Two Destroyers

The U.S. Navy has awarded \$738.8 million to Litton's Ingalls Shipbuilding division to build two Arleigh Burke (DDG-51) class Aegis guided missile destroyers. This award funds construction by Ingalls of its second and third ships in a two-year plan announced by the Navy last July to divide construc-

tion of six Aegis destroyers between Ingalls and Bath Iron Works, of Bath, Maine, in the government's 1994 and 1995 fiscal years.

The Navy's allocation plan provided one ship to Ingalls last year and two to Bath. This year, Ingalls is awarded the funding for the two ships, with one to Bath. The Navy has now ordered 32 ships of the class, including 14 from Ingalls in Pascagoula, Miss. The Navy had announced last month its plan to

procure 16 additional Aegis destroyers over the next five years. Three Ingalls-built destroyers are now in active service, with four more ships planned for delivery by Ingalls in 1995.

The new award brings Ingalls' business backlog to \$3.5 billion, involving the construction of 14 Aegis destroyers, amphibious assault ships and corvettes.

For more information from Ingalls
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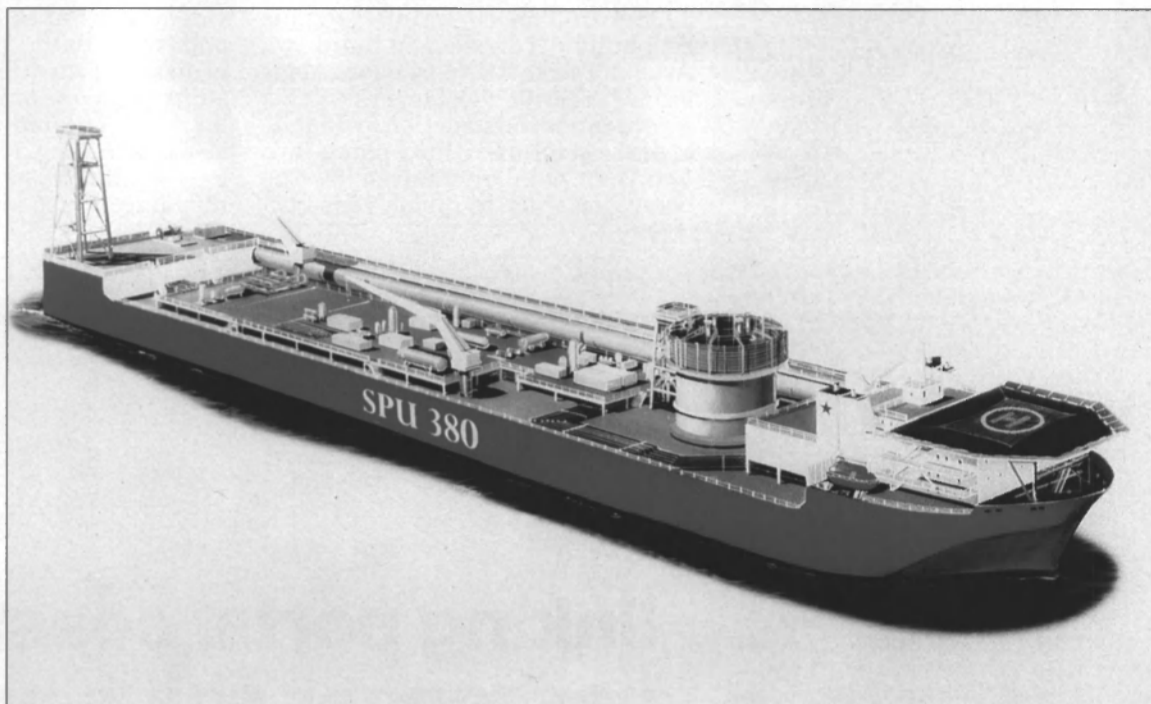
MAN B&W Diesel, Inc., 17 State Street, New York, NY 10004, Telephone (212) 2 69-09 80

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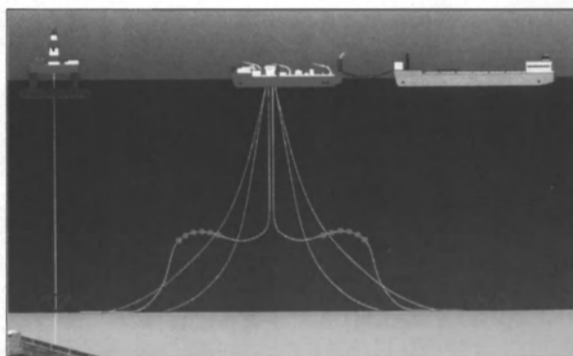
PROPULSION UPDATE

Wärtsilä Diesel Receives Two Large Orders For Gas-Diesel Engines

Wartsila Diesel secured orders for 12 of its gas-diesel (GD) engines to be placed on a pair of floating production storage and offloading (FPSO) vessels, as initially reported in *Maritime Reporter & Engineering News*, page 5, January 1995. Four Wartsila 16V32GD engines will power an FPSO being built by Far East Livingston Shipbuilding in Singapore for Smedvig A/S in Norway, one of the world's leading oilfield service contractors. The FPSO will measure 692 ft. (211 m) long by 118 ft. (36 m) across, with a 46-ft. (14-m) depth. The vessel will have a storage capacity of 380,000 barrels and a production rate of 45,000 barrels per day. The engines are rated 5,920 kW at 720 rpm each, and delivery is planned for May. The second project involves the conversion of a Russian submarine repair vessel by Golar-Nor/McDermott for the first phase of BP's



Wartsila gas-diesel engines were chosen for a FPSO being built by FELS for Norway's Smedvig.



SPU 380 at field.

Foinaven project in the North Sea. The vessel's four existing Wartsila 16V32 engines will be converted into gas-diesel generating sets, each with an output of 6,000 kW at 750 rpm. Additionally, four new Wartsila 18V32 GDs have been ordered for the same engine room, each with an output of 6,750 kW at 750 rpm. Delivery of the engines is scheduled for April.

Gas-Diesel Technology

Gas-diesel technology offers FPSO owners the same degree of flexibility as the vessels themselves, according to Wärtsilä. Besides heavy fuel and normal marine diesel oils, they are designed to operate on natural gas and even crude oil directly from the well.

Wartsila's new GD technology helps increase flexibility even more, as it allows the engine to switch from one fuel to another without any shut-down in power production. The design also allows conversion of existing diesel engines with relatively small modifications, according to the manufacturer.

Efficiency is another touted feature. For fuels directly from the well, for example, a high total efficiency of more than 45 percent can be achieved, which Wärtsilä claims is about 10 percentage points higher than for gas turbines. This can, in turn, help to reduce carbon dioxide and sulphur oxide emissions.

For more information on Wärtsilä
Circle 12 on Reader Service Card



Second Of Smit Transport's "Giant" Vessels Completes Life Extension

Smit Transport is more than halfway through a major life extension program for its three "Giant Class" semisubmersible barges. Pictured above is the *Giant 3*, 24,000-dwt, in the English Channel on her way to Portugal following a life extension drydocking. Two of the 24,000-dwt vessels have now completed the program, and the final heavy transport semisub is likely to drydock for life extension towards the end of this year.

The Giant semi-subs were built in 1977-78. Each life extension requires six to eight weeks; the work includes cleaning, renovation and the complete internal recoating of tanks.

Cover Guard™ Protection System Protects Surfaces During Refurbishing

Flame-retardant Cover Guard temporary wall and floor protection system — from Bainbridge/Aquabatten Inc. of Canton, Mass. — has been designed to meet the harsh and hazardous requirements of the maritime construction and maintenance industries. It was designed to protect vinyl, ceramic, wood, marble, carpet and painted surfaces from abuse during refurbishment projects and new construction.

Made from flame-retardant polyethylene materials, Cover Guard reportedly provides great strength in a lightweight, easy to handle and quick to fit material.

Ease of handling provides savings in labor costs.

The system reportedly meets health and safety standards, is non-toxic, non-staining, environmentally friendly, and disposable through conventional recycling methods.

For more information on Cover Guard
Circle 73 on Reader Service Card

Firms To Market Hovercraft

Hovercraft Concepts, Inc. of Miami signed an agreement with the Angle Group of Japan to develop, manufacture and market hovercraft products to recreational and commercial markets. The first product delivery is scheduled for March 1995 with an open two-person hovercraft called the Aerocruiser. This will be followed closely by a low-cost UPS shippable kit hovercraft.

For more information
Circle 102 on Reader Service Card

Dynamation's Gas Detector Targets Shipbuilding

The CGM gas monitor from Dynamation detects most gases and toxic vapors with a portable instrument its makers say is ideally suited for the shipbuilding industry. Specific sensors for O₂, combustibles and CO/H₂S as well as a broad-range MOS sensor for detecting hundreds of gases and vapors at toxic levels are present.

For more information on Dynamation
Circle 103 on Reader Service Card

USCG, ABS Sign Agreement

MOU expands responsibility delegated to ABS

A memorandum of understanding (MOU) was signed by the U.S. Coast Guard (USCG) and the American Bureau of Shipping (ABS) that expands the scope of plan review and inspection procedures delegated to the ABS.

The document is the foundation of the USCG's ABS based Alternate Compliance Program that was designed to increase the U.S. maritime industry's international competitiveness by reducing burdensome national regulations. The program will eliminate duplication by the USCG and the ABS when verifying whether or not ABS classed U.S.-flag vessels conform to the required safety standards.

Adm. **Robert Kramek**, commandant of the USCG, and ABS Chairman **Frank Iarossi** signed the MOU that delegates authority and sets guidelines for cooperation between the two organizations concerning plan review, and the initial and subsequent inspections required for certification. The MOU stipulates requirements for information exchange; program oversight; contacts in the respective organizations; and the qualifications required for ABS personnel involved in carrying out the program.

Also, the MOU provides for ABS to conduct tonnage measurement of U.S.-flag ships for the USCG according to the International Convention on the Tonnage Measurement of Ships 1969, and to conduct all tonnage measurement interpretations and policies of the USCG — within the scope of authority delegated — that would normally be applied to U.S.-flag vessels.

"This is a positive step forward in the promotion of Safety of Life at Sea (SOLAS) and toward protecting the marine environment," Adm. **Kramek** said. "It will provide the industry with greater flexibility in complying with regulatory requirements and allow the Coast Guard to focus its resources on vessels that pose the greatest safety and environmental risks, and on those human factor areas largely responsible for marine casualties."

"This has certainly paid off by strengthening and simplifying the compliance process for U.S.-flag ship owners," Mr. **Iarossi** said. "Under this program, compliance with the Coast Guard requirements can be verified by the ABS surveyor while the ABS class and statutory surveys are being conducted. This system will be more effective and represents a well developed and close working relationship between our two agencies."

For more information from ABS
Circle 29 on Reader Service Card

Midland Completes \$47 Million Sale

The Midland Company announced that M/G Transport Services, Inc., its wholly owned subsidiary, has concluded the previously announced sale of eight towboats and 314 barges in a transaction valued at approximately \$47 million. The assets were sold to Ingram Ohio Barge Com-

pany, a subsidiary of Ingram Industries located in Nashville, Tenn. As part of the transaction, Ingram assumed M/G's affreightment contracts. In addition, the company exchanged 40 open hopper barges for 40 of Ingram's steel roll top barges. These assets were sold at a modest book profit. This sale represented approximately 66 percent of the company's river transportation assets. M/G Transport, Midland's pri-

mary river transportation company, will no longer be operating boats along the Ohio and Mississippi Rivers. M/G Transport will continue to own four towboats that are out on longer term charters and it will also continue to own 279 barges. Midland, which is headquartered in Cincinnati, is engaged in insurance and finance operations, the transportation of commodities and the sportswear business.

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NATIONAL DREDGING REPORT

National Approach To Dredging Projects Adopted By Interagency Working Group

Secretary of Transportation **Federico Peña** released an Interagency Working Group report adopted by six federal agencies establishing a national dredging policy. The Action Plan is a commitment to implement 18 recommendations to improve the existing process within current resources and budget realities. "This report responds to President Clinton's request last year that federal agencies double their efforts, without compromising environmental protection, to resolve the navigational and environmental concerns that have long stymied the dredging of our nation's ports," Mr. Peña said.

"Because 95 percent of America's foreign commerce is carried by ships and foreign trade accounts for 20 percent of our Gross Domestic Prod-

uct, our ports are vital to our national security and economy. Yet many ports are located in or near some of our nation's most environmentally sensitive areas such as wetlands, estuaries and associated fisheries, all of which have economic, recreational and aesthetic value. Coordinated action to resolve conflicting interests is important to our national interest," Mr. Peña added.

Dr. **John Zirschky**, acting assistant secretary of the Army for civil works, praised the Interagency Working Group. "We fully endorse the report and its conclusions. The recommendations will improve the efficiency and predictability of the current system. We look forward to continued interagency coordination and cooperation in implementing this action plan."



Robert Perciasepe, assistant administrator for water at the Environmental Protection Agency, added, "This report highlights the cooperative interest of a number of federal agencies in resolving dredging and associated environmental issues. We are particularly pleased with the recommendations for advanced environmental planning in the dredging and disposal permit process."

The report's recommendations focus on four problem areas in order to: strengthen the existing planning mechanism; enhance coordination and communication in the dredging approval process; address scientific uncertainties about dredged material; and identify consistent and efficient ways to fund dredging projects. The Interagency Working Group, convened by Mr. Peña, developed its recommendations through 22 public outreach sessions held around the country in early 1994.

The Interagency Working Group was chaired by Deputy Administrator **Joan Yim**, of the Department of Transportation's Maritime Administration (MarAd). Besides the U.S. Army Corps of Engineers and the Environmental Protection Agency (EPA), member agencies included the Department of the Interior's Fish and Wildlife Service, and the Department of Commerce's National Marine Fisheries Service and Office of Ocean and Coastal Resource Management.

There were liaison representatives to the Group from the White House Office on Environmental Policy, the Office of Management and Budget, the Navy and, from the Department of Transportation, the Office of the Secretary and the U.S.

Coast Guard. The current Working Group will be replaced by national and regional dredging teams, co-chaired by the Corps and the EPA, with representatives from the Transportation, Interior and Commerce departments.

Copies of the report may be obtained from MarAd's Office of Congressional and Public Affairs, tel: (202) 366-5807.

MTD: "Dredging Report Important Step In Alleviating Permit Delays"

An interagency report released by the Clinton Administration marks an important first step in alleviating the expensive and time-consuming delays which are threatening the competitiveness of this nation's port facilities, said **Michael Sacco**, president of the Maritime Trades Department (MTD), AFL-CIO, which represents 42 autonomous unions. As reported in the study itself, ports play an essential role in defense and economic development of this nation. In 1992 alone, ports handled 2.9 billion metric tons of cargo and supported more than 15 million jobs.

Moreover, in an era of increasing international trade, 95 percent of this nation's exports and imports had to go through port facilities to reach their final destination. However, the lack of a comprehensive national dredging policy, interagency infighting, a growing public awareness about environmental concerns, the failure of state and federal authorities to coordinate their efforts and revolutionary changes in the international shipping industry (containerization, intermodalism) have made it difficult for port facilities to expand or even maintain their facilities.

US ARMY CORPS OF ENGINEERS FY 95 Contract Dredging Program

Job Name	Qty. (Cu. Yd.)	Winning Bid	Winning Bidder
NAP District PHILADELPHIA			
Ocean City/Peck Beach	400,000	\$2,425,000	Great Lakes Dredge & Dock
Cape May Beach Fill	300,000	\$2,438,995	Great Lakes Dredge & Dock
NAP Totals: 2 Contracts	700,000 CYS	\$4,863,995	
NCE District DETROIT			
St. Joseph Harbor	50,000		King Co. Inc.
NCE Totals: 1 Contracts	50,000 CYS	\$0	
NED District NEW ENGLAND			
Wellfleet Harbor	150,000	\$1,043,500	Great Lakes Dredge & Dock
NED Totals: 1 Contracts	150,000 CYS	\$1,043,500	
NPP District PORTLAND			
Port Orford Boat Hoist	6,000	\$222,000	NE Halem River Dredging
Chinook Channel	145,000	\$592,675	M. Cutter
Gov. South Channel			
205 Shoal	15,500	\$24,895	Portable Hydraulic Dredge
NPP Totals: 3 Contracts	166,500 CYS	\$839,570	
NPS District SEATTLE			
Swinomish Channel, Wa.	100,000	\$735,500	American Construction Co.
NPS Totals: 1 Contracts	100,000 CYS	\$735,500	
SAC District CHARLESTON			
Charleston Entrance	1,300,000	\$1,660,000	NATCO Ltd. Partnership
AIWW Jeremy & Vicinity	310,000	\$602,000	Wright Dredging
SAC Totals: 2 Contracts	1,610,000 CYS	\$2,262,000	
SAJ District JACKSONVILLE			
Duval Co B.	1,250,000	\$7,377,795	Gulf Coast Trailing Co.
St. Lucie Inlet Emergency	156,000	\$1,721,904	Great Lakes Dredge & Dock
Sand Bypass System			
Canaveral	705,000	\$4,050,200	Weeks Marine Inc.
Palm Beach Harbor	146,000	\$1,450,000	Great Lakes Dredge & Dock
Canaveral Harbor	300,000	\$767,270	Dutra Dredging
SAJ Totals: 5 Contracts	2,557,000 CYS	\$15,367,169	
SAM District MOBILE			
Perdido Pass, AL	300,000	\$1,029,300	River Road Construction
BW&T Rivers, Upper	2,200,000	\$1,810,160	Hendry Corp.
SAM Totals: 2 Contracts	2,500,000 CYS	\$2,839,460	
TOTAL 17 Contracts	7,833,500 CYS	\$27,951,194	

SOURCE: U.S. ARMY CORPS OF ENGINEERS

U.S. Army Corps of Engineers has

VESSEL CONTRACTS AVAILABLE

Army Corps of Engineers Seeks Bids To Build 50-ft. Motortender

The director of the U.S. Army Corps of Engineers' Marine Design

Center (MDC) has announced issue of Invitation for Bids No. DACW61-95-B-0018 for the design, construction, testing and delivery of a steel motortender for use on the Tennessee/Cumberland River systems by

the Nashville District, USACE.

Vessel dimensions are 50 ft. (15.2 m) long with an 18-ft. (5.5-m) beam and a 9-ft. (2.74-m) depths. The vessel will provide towing and tender service for lock and dam maintenance and dredging equipment, and will be classed by ABS.

The bid package is a "design and build" type based on a final design prepared by the MDC. That final design is from a similar vessel built in 1992. The contract will be con-

ducted using the MDC's three phase contracting methodology.

Liquidated damages are included in the contract and bonding is required. The vessel will be delivered to Nashville, Tenn.

The bid package is available at a charge of \$35 per set, after January 15. Bid opening is anticipated in April 1995.

For more information, contact: U.S. Army Corps of Engineers, Philadelphia District, Wanamaker Building, 100 Penn Square East, Philadelphia, Pa. 19107-3391, ATTN: CENAP-CT.

Army Corps Asks For Bids To Build Two 65-ft. Aluminum Survey Vessels

The director of the U.S. Army Corps of Engineers' Marine Design Center (MDC) announced issue of Invitation for Bids No. DACW61-95-B-0024 for the design, construction, testing and delivery of two 65-ft. aluminum survey vessels for use in the U.S. Army Corps of Engineers' New York and Norfolk Districts on the N.Y. Harbor and Chesapeake Bay Systems.

The vessels are essentially identical except that one is to be furnished with a high-performance, high-speed propulsion system and the other will feature a similar but lower-performance system. Each will have minor individual custom features.

Each vessel is to be approximately 65 ft. (19.8 m) long, 18 ft. (5.5 m) wide with a 6-ft. (1.8-m) draft.

The vessels are designed for all aluminum construction with special consideration given to weight limitations to permit low speed, shallow water operation and sprint operation between work sites. Both vessels have propulsion systems, hull machinery, generating systems and necessary support systems. The vessels are based on the "Concept Designs" prepared by the MDC.

Testing will be required and must be performed in the open waters of the Atlantic Ocean, or other location with similar operating conditions. A full spectrum of testing to prove the design and engineering concepts is required.

The vessels will be classed by ABS and certified as Subchapter T, small passenger vessel by the U.S. Coast Guard. The procurement will be conducted as a two-step formal advertising type as prescribed in SubPart 14.5 of the Federal Acquisition Regulations. Liquidated damages are included in the contract and bonding is required.

One vessel will be delivered to the New York District and the other to the Norfolk District.

The Request For Technical Proposals (RFTP) will be available after February 6, and the proposal period is expected to end about March 10. Bid opening is planned for late May.

For more information, contact: Commander and District Engineer, U.S. Army Corps of Engineers, Philadelphia District, Custom House, Second and Chestnut Streets, Philadelphia, Pa. 19106; ATTN: CENAP-CT (TOTH); Reference: DACW61-95-B-0024.

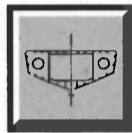
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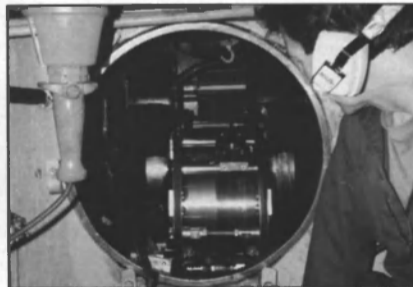
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Impact of Propulsion Plant Choice On Maintenance

Maintenance is one of the keys to profitability in shipping. In fact, the maintenance of machinery is often a top design priority from the initial stages of most projects. In 1993, Deltamarin of Finland completed a case study, in preparation for the TT-Line passenger ferry project, that evaluated and quantified the level of annual expenses attributed to maintenance and repair (M&R) of diesel engines. One of the primary concerns of the study was whether the machinery choice would have any significant impact on expected maintenance costs. The study indicated that the conventional diesel machinery would have somewhat lower acquisition cost, but the diesel-electric solution was superior in possibilities for novel machinery arrangement, offering a chance for larger cargo space and efficient lower cargo hold operations. Although many other factors play a part in machinery selection, the M&R aspects are a key element in the buying decision.

Machinery concept related differences were evaluated by comparing the M&R costs between diesel-electric concept (D-E) and diesel-mechanical concept (D-M). Two alternative machinery concepts were presented; and in an effort to remain consistent, engines by the same manufacturer were selected. Total installed main engine power was about 18 MW for both models. Deltamarin found that the D-E machinery was the favorable option, based upon an 18 percent difference in service hours, spare parts costs and total costs. In terms of the complexity of installation and also on the number of separate devices needed to run the systems, M&R costs were found to be lower for systems with less equipment. Less machinery equals a lesser demand for repairs. On a D-E ship, there are no separate engines for propulsion and ship electric production; therefore, the ancillary systems are simpler and less expensive.

These conclusions are based on figures which calculated the scheduled M&R costs for machineries and corresponding ancillary systems. All data was based on supplier's manuals and information for scheduled maintenance and spares for a machinery operating according to a specified profile. Actual operation profile and corresponding engine loading and running hours were calculated for a period of eight years in order to get a true figure of the differences under long term operation. Annual increase in M&R costs due to inflation was ignored.

In addition to machinery related concepts, fuel choice related consequences were also examined. All comparisons between MDO burning and HFO burning were made between two similar D-E machineries. Deltamarin's study concluded that HFO would cause a 29 percent increase in engine spare parts costs due to the increased complexity of the fuel system. As determined earlier in the discussion on machinery, fewer system complications generally indicate a more modest budget. Overall, HFO systems tallied costs equaling 19 percent more than

the MDO fuel burning systems. In this scenario, the study concluded that HFO is therefore less cost-effective. In a real-case scenario set up by Deltamarin, use of HFO instead of MDO forecasted a 54 percent cost differential between the options. After manning, M&R is usually the largest item among operating cost of a ship.

The cost implications of damage or unscheduled repairs are largely unquantifiable, but as demonstrated

by Deltamarin's study, it is possible to project maintenance costs by examining factors such as machinery and fuel burning. Other maintenance factors not looked at in this particular study include drydocking, tank cleaning and coating, boilers, hull, piping system, electric, external and internal cleaning and painting.

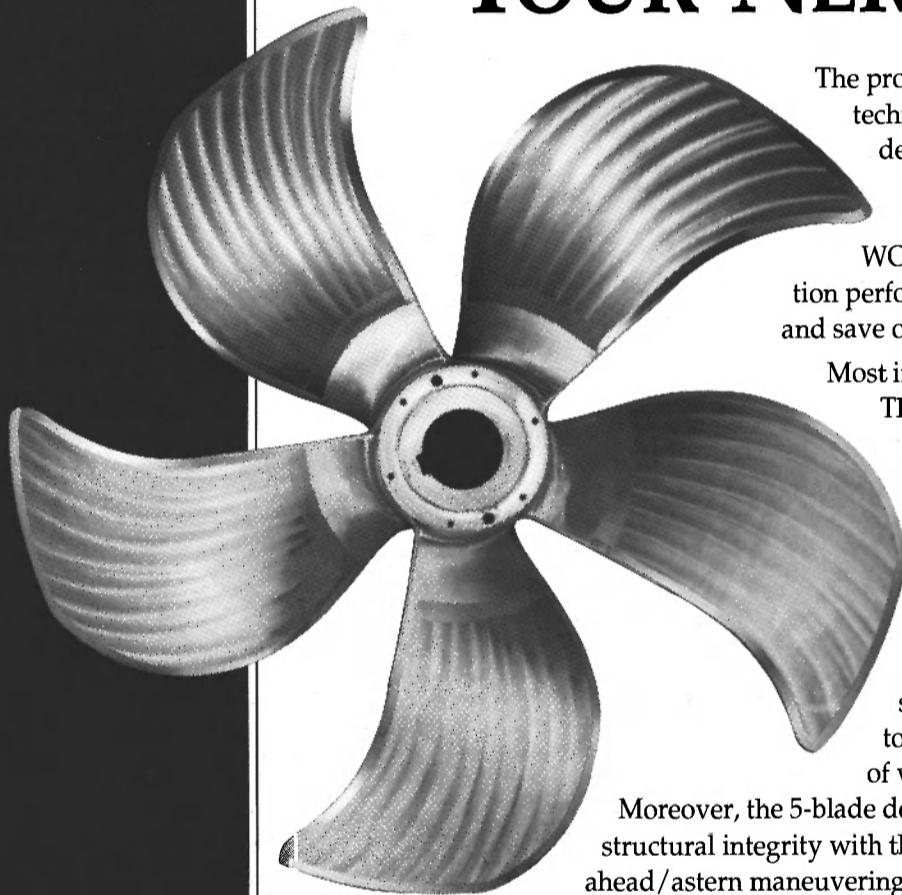
One of the most difficult operating costs to evaluate and quantify is the level of annual expenses attrib-

uted to M&R. Deltamarin's study showed that machinery and fuel choice have a demonstrated impact on M&R costs, and therefore equipped the TT-Line passenger ferry ships with diesel-electric propulsion and MDO burning engines.

This information was excerpted from Deltamarin's study, "Impact of Propulsion Plant Choice on Maintenance."

For more information on Deltamarin
Circle 59 on Reader Service Card

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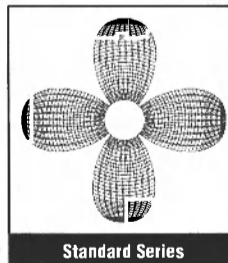
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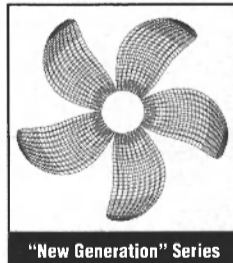
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BIRD-JOHNSON COMPANY

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1995 MARINE PROPULSION SELECTION GUIDE

Maritime Reporter & Engineering News' 1995 Marine Propulsion Guide is intended as a year-round reference to be used when selecting propulsion machinery and auxiliary components. To be considered for inclusion in the next directory, please submit — in writing via mail or fax — all pertinent details to: *Maritime Reporter & Engineering News*, 118 E. 25th St., New York, N.Y. 10010; fax: (212) 254-6271; ATTN: EDITOR. Publisher is not responsible for errors or omissions.

A

ABB Industrial Systems Inc.
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Brewster, NY 10509 USA
Contact: Robert Sarnelli
Tel: (914) 278-6810
Fax: (914) 278-6841
Diesel engine monitoring systems

ABB Industry Oy/Marine Division
PO Box 185
00381 Helsinki, Finland
Contact: Thomas Hackman, marketing manager
Tel: (+3580) 564 2110
Fax: (+3580) 564 2350
Electric propulsion and power plants

ABB Turbo Systems Ltd.
CH-5401 Baden, Switzerland
Contact: Paul Russak
Tel: +41 056 75 5152
Fax: +41 056 75 5144
Diesel engines

ABB Turbocharger Co.
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N. Brunswick, NJ 08902 USA
Tel: (201) 932-6241
Fax: (201) 932-6378

Alaska Diesel Electric
4420 14th Avenue NW, PO Box 70543
Seattle, Washington 98107 USA
Contact: Kurt Hoehne
Tel: (206) 789-3880
Fax: (206) 782-5455
Diesel engines, gensets

Allison Engine Company, Inc.
PO Box 420 Speed Code U-05
Indianapolis, Indiana 46206-0420 USA
Contact: H.L. Holzworth
Tel: (317) 230-5617
Fax: (317) 230-2900
Gas turbines

American Hydro Jet Corporation (Amjet)
2033-F West McNab Road
Fort Lauderdale, Florida 33069 USA
Contact: Paul W. Roos
Tel: (305) 978-8996
Fax: (305) 978-6597
Waterjets

Aquamaster-Rauma Inc.
2315 N. Woodlawn Ave. Suite 103
Metairie, Louisiana 70001 USA
Contact: Debra Hackney
Tel: (504) 883-8340
Fax: (504) 883-8344
Thrusters, Z-drives, contra-rotating propellers,
deck equip.

Aquamaster-Rauma Ltd.
PO Box 220
FIN 26101 Rauma, Finland
Contact: Esa Uotinen
Tel: +358 38 3791
Fax: +358 38 379 4804
Thrusters, azimuth thrusters

B

Berg Propulsion AB
Box 1005 S-43090 Öckerö Sweden
Contact: Claes Elfström
Tel: +46 31969020
Fax: +46 31969456
Thrusters, propellers, gears

Bird-Johnson Company
3719 Industrial Road
Pascagoula, Mississippi 39581 USA
Contact: James B. Travis
Tel: (601) 762-0728
Fax: (601) 769-7048
Propellers, thrusters, waterjets

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Fax: (508) 668-5638
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D-38124 Braunschweig, Germany
Contact: P. Bhattacharya
Tel: +49 (0)531-2605-0
Fax: +49 (0)531-2605-300
Plain bearings for diesel engines, compressors,
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Brunvoll AS
Strandgata 4-6
N-6400 Molde Norway
Contact: Terje Dyrseth
Tel: +47 72 51 966
Fax: +47 72 53 424
Thrusters, propellers, drive system packages and
thruster control systems

C

Caterpillar Inc., N4-NOS112
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Mossville, Illinois 61552 USA
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Fax: (309) 578-2559
Contact: Sally Forker
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Centa Antriebe Kirschev GmbH
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Bergische Str. 7 - D-42781 Haan Germany
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Fax: +46 40 214068
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5657 Wooster Pk.
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Fax: (513) 271-0049
Marine propulsion systems, epicyclic units,
generator drives

CKD USA (Agents: Tripes Materials)
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El Cajon, California 92021 USA
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Diesel generator sets, Vulcan couplings

Cleveland Gear Co.
3249 E. 80th
Cleveland, Ohio 44104 USA
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Fax: (216) 641-9080
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filtration systems

Crucible Service Centers
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Camilius, New York 13031-0991 USA
Contact: Theodore O. Reich
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Fax: (315) 487-4028
Stainless steel boat shafting

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Charleston, S. Carolina 29405-8521 USA
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Tel: (803) 745-1615
Fax: (803) 745-1549
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Cummins Mid-South Inc.
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Kenner, Louisiana 70062 USA
Contact: Calvin B. Klotz, Jr.
Tel: (504) 468-3535
Fax: (504) 465-3408
Diesel engines, diesel generator sets

D

Daihatsu Diesel Mfg. Co., Ltd.
2-10 2-chome, Nihonbashi-Honshu, Chuo-ku
Tokyo, 103, Japan
Contact: Overseas Department
Tel: +81 03 3279 0827
Fax: +81 03 3245 0395
Diesel engines, Gas turbines

Daytona Marine Engine Corp.
1815 North U.S. 1
Ormond Bch., Florida 32174 USA
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Tel: (904) 676-1140
Fax: (904) 676-0164
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Deere Power Systems
3801 West Ridgeway Avenue PO Box 5100
Waterloo, Iowa 50704-5100 USA
Contact: Tom Withers
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Fax: (319) 292-5075
Diesel engines

Deere Power Systems, John Deere Engine
Division
PB13 45401 Fleury les Aubrais
Usine de Saran, France
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Tel: +33 38826119
Fax: +33 38826000
Diesel engines

John Deere Intercontinental, GmbH
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Moline, Illinois 61265-1388 USA
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Tel: (309) 765-3310
Fax: (309) 765-3197
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Detroit Diesel Corp.
13400 Outer Drive West
Detroit, Michigan 48239-4001 USA
Contact: Al Kozel
Tel: (313) 592-5000
Fax: (313) 592-5058
Diesel engines, gears

Deutz Motoren-Werke Mannheim (MWM) AG
Carl-Benz Str. 5

D-68140 Mannheim, Germany
Contact: Jens Eybacher
Tel: +49 621 384781
fax: +49 621 384211
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Dieselmotorenwerk Rostock GmbH
Erich-Schlesinger-Strasse 50
0-2500 Rostock 6 Germany
Tel: +49 37 81 3890
Fax: +49 37 81 22600

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Norfolk, Virginia 23501-2100 USA
Contact: P.K. Hargis
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Fax: (804) 494-4164
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DMR
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D-18059 Rostock, Germany
Contact: Herr Bialowons
Tel: +49 381 4596 282
Fax: +49 381 4922600
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Electro-Motive Division of GM Corp.
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La Grange, Illinois 60525 USA
Contact: Robert Grasek
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Fax: (708) 387-5845
Diesel engines, reverse-reduction gears

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D-22761 Hamburg, Germany
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Tel: +49 040 8504026 27
Fax: +49 040 8501070
Diesel engines/spares

G

GE Marine & Industrial Engines
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Fax: (513) 552-5001
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Fax: +44 206 79 7869
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c/o EGT Inc.
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Houston, Texas 77084 USA
Contact: S.G. Morrow
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Fax: (713) 892 8277
Diesel engines

GEC Alsthom Ruston Diesels Ltd.
Vulcan Works, Newton-de-Willows
Merseyside, England WA1Z 8RD
Contact: C. Foulkes, sales director
Tel: +44 (925) 225151
Fax: +44 (925) 222055
Diesel engines

General Electric Transportation Systems
2901 East Lake Road
Erie, Pennsylvania 16513 USA
Contact: John A. Molitoriss
Tel: (814) 875-3531

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Diesel engines

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Talisman, Duncan Road, Park Gate
Southampton, Hants, 5031 7GA England
Contact: C.R. Galley
Tel: +44 (0)489 8852 88
Fax: +44 (0)489 885199
Diesel engines

H

HamiltonJet
PO Box 709
Christchurch, New Zealand
Contact: John Walsh
Tel: +64 (3) 348 4179
Fax: +64 (3) 348 6969
Waterjets

Hatch & Kirk
601 McFarland Road
Houston, Texas 77011 USA
Contact: Chris Mainz
Tel: (713) 926-9771
Fax: (713) 926-4147

Holland Rudderpropeller USA
4450 General De Gaulle Drive, Suite 1118
New Orleans, Louisiana 70131 USA
Contact: Gonzalo Galleguilles
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Fax: (504) 393-5006
Thrusters, propellers, waterjets

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Cincinnati, Ohio 45240
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Tel: (513) 825-9600
Fax: (513) 825-2967
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I

Innovation Marine Corp.
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Fax: (813) 751-5398
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Contact: Dr. Jens Bartels
Tel: +49 7321 376582
Propellers

K

KaMeWa AB
PO Box 1010
68129 Kristinehamn, Sweden
Contact: Olof Malmquist
Tel: +46 (550) 84010
Fax: +46 (550) 18190
Thrusters, propellers, waterjets

Karl Senner, Inc.
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Kenner, Louisiana 70062 USA

Contact: Michael K. Senner
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Fax: (504) 464-7528
Propellers, gears

Kawasaki Heavy Industries
World Trade Center Building

4-1, Hamamatsu-Cho, 2-chome, Minato-Ku
Tokyo 105 Japan
Contact: Marine Machinery Sales Dept., Prime
Mover Div.
Tel: +81 3 3435 2374
Fax: +81 3 3435 2022
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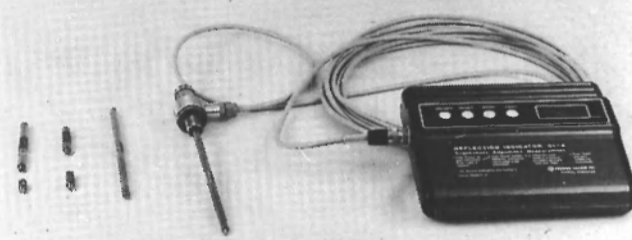
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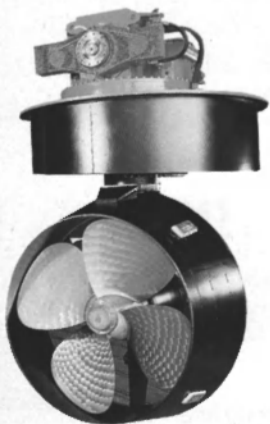
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Krupp MaK Maschinenbau GmbH
Falckensteiner Str. 2
24159 Kiel, Germany
Contact: J. Homeyer, Dept. CM30
Tel: +49 4313995 587
Fax: +49 431 3995 588
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Lipstraat 52 PO Box 6
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M

MAAG Gear Co.
Hardstrasse 219
CH-8023 Zurich, Switzerland
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Tel: +41 01/278 78 78
Fax: +41 01/278 78 80
Gears

MAN B&W Diesel AS, Alpha Diesel
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9900 Friederichshafen, Denmark
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Fax: +45 9620 4030
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New York, NY 10004 USA
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MAN B&W Diesel GmbH
Presse-und Informationsstelle
Postfach 10 00 80
8900 Augsburg 1
Tel: +49 (0821) 322-1

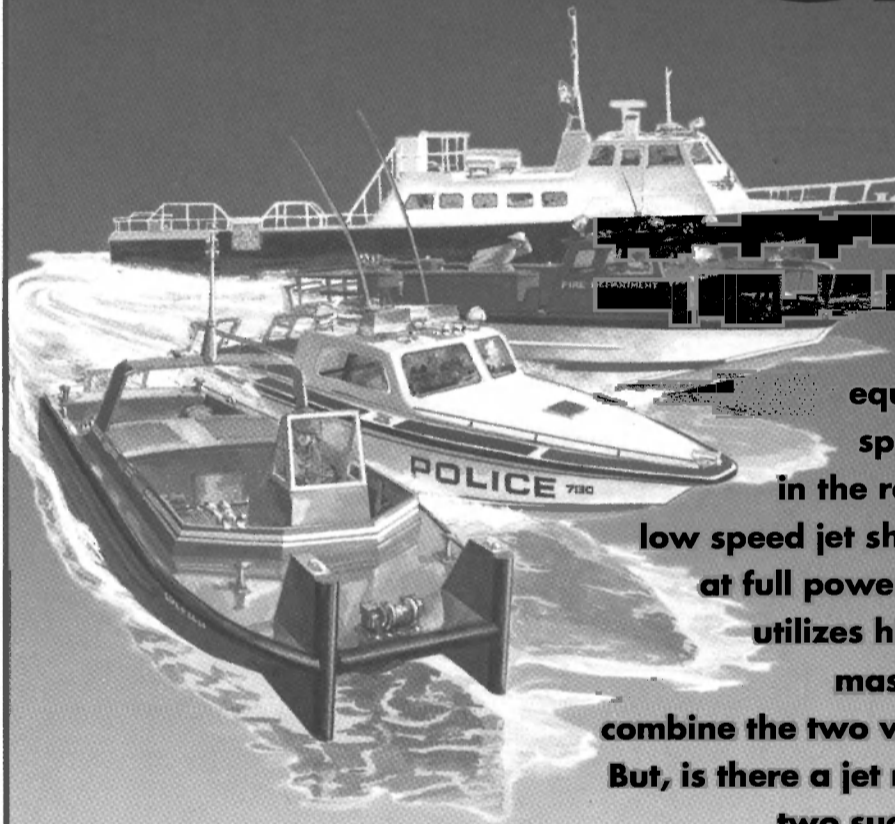
Fax: +49 (0821) 322-3382

MAN B&W Diesel A/S, Holeby
Østervej 2
4960 Holeby, Denmark
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Tel: +54 69 31 00
Fax +54 69 30 30

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Diesel engines
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Marine Propulsion Inc.
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JETS FAST SLOW



High Speed/Low Speed

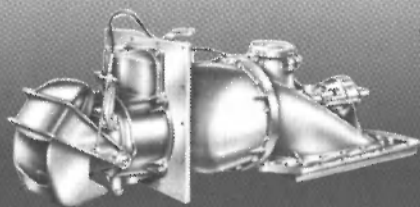
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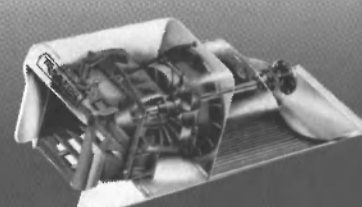
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Fax: (504) 542-5347
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Fax: (207) 371-2169
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Chiyoda-ku, Tokyo, Japan
Contact: Tatsuo Tajima, acting gen. mgr., diesel planning
Tel: +81 3 3212 9080
Fax: +81 3 3212 9779
Diesel engines

MKW Power Systems
PO Box 1928 301 S. Church Street
Rocky Mount, North Carolina 27804 USA
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Fax: (919) 446-3830
Diesel engines, generator sets

MTU North America
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Fax: (713) 240 8032
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MWB Motorenwerk Bremerhaven GmbH
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Bremerhaven Germany
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N

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Fax: (201) 217-1312
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Fax: (501) 778-6381
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Fax: (310) 841-0309
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P

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W-4220 Dinslaken Germany
Tel: +49 (05151) 1 04-0
Fax: +49 (05151) 1 04-3 00

Renk Tacke GmbH
Rodder Damm 170 D-48432
Rheine, Germany
Contact: Mr. J. Hondelink, sales mgr.,
Tel: +49 (5971) 790-317
Fax: +49 (5971) 790-208
Gears

Renk Tacke GmbH
Gogginger Str. 73, D-86159
Augsburg, Germany
Contact: Mr. K. H. Merk
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Fax: +49 (821) 5700-559
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Melbourne, Florida 32934 USA
Tel: (407) 242-7552
Fax: (407) 242-7771
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S

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Hammond, Louisiana 70403 USA
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couplings and drivelines

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Mainzer Strasse 99
D-56322 Spay/Rhein, Germany
Contact: Dipl. Ing. Uwe Gragen, director of
marketing & sales
Tel: +49 26 28 6 10
Fax: +49 26 28 6 13 00
Thrusters, waterjets

SEMT Pielstick
2 Quai de Seine
93203 Saint-Denis, Cedex 1-France
Contact: H.T. Hylander
Tel: + 33 1 48 09 76 00
Fax: + 33 1 48 09 78 78
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Erie, Pennsylvania 16501 USA
Contact: John Feuell
Tel: (814) 459-0570
Fax: (814) 452-6259
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SKL Motoren-und-Systemtechnik GmbH
- vorm. Buckau-Worlf -
Alt Salbke 6-10, 39122 Magdeburg, Germany
Contact: SKL Engine Sales
Tel: +49 (03 91) 432 2130
Fax: +49 (03 91) 432 4015
Diesel engines

Skoda Concern Plzen CR
c/o Tripes Materials, U.S. agent
1173 B Persimmon Ave.

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Fax: (504) 348-8970
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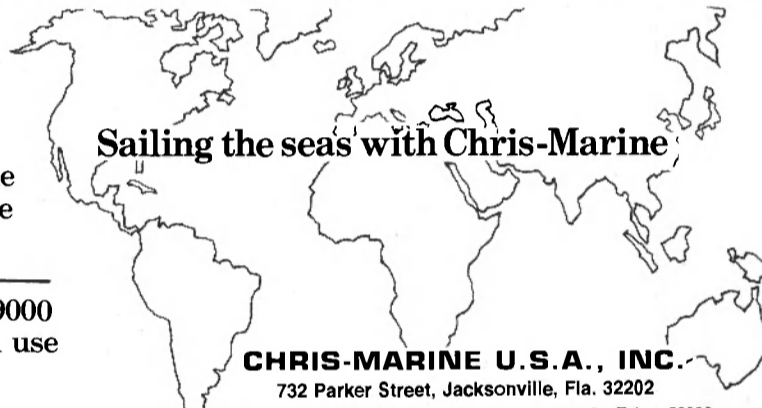
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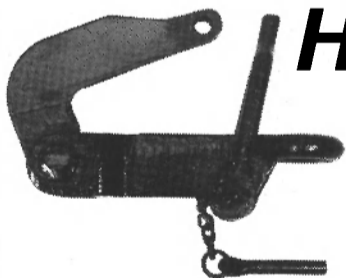
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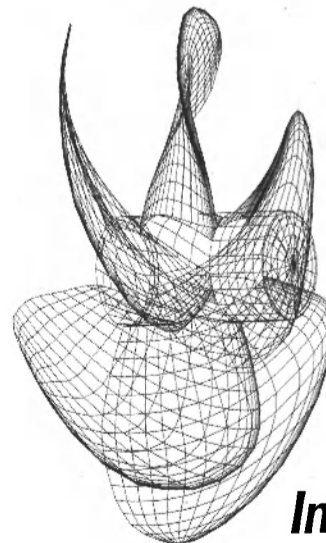


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1995 MARINE PROPULSION SELECTION GUIDE

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Contact: Iage Blomberg, VP Marine Engines
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Fax: +358 613171906
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Contact: Martin Solnes
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Fax: +47 53423501
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Contact: Marianne Kopf
Tel: +33 89666868
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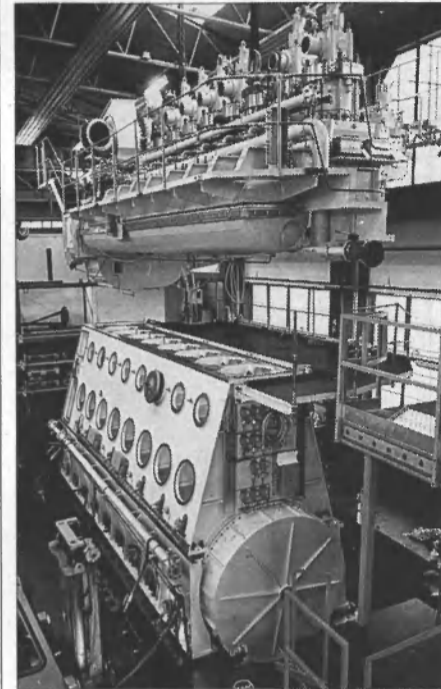
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Gears

Eight-Cylinder, 10,840-hp Engine Built For Containership



MAN B&W Diesel A/S, Alpha Diesel in Frederikshavn, Denmark built reportedly the largest two-stroke, small-bore engine ever during the winter of 1994. The unit is an eight-cylinder MAN B&W type 8L42MC rated at 10,840 hp at 176 rpm. It was built for a 950-TEU containership being built at the Singapore Shipbuilding and Engineering shipyard.

The 42 cm-bore engine in the eight cylinder configuration — which weighs 160 tons — is about the maximum size of engine which can be launched by the existing production equipment.

Following the delivery of the first small-bore S26MC engine in 1988, a total of 60 small-bore, two-stroke engines have been ordered from the Alpha factory. The engine program today is comprised of five engine series — the S26-, L35-, S35-, L42- and S42MC — covering the power range from 2,180 to 12,500 hp. The engines can be delivered as single engines, or as fully integrated propulsion systems including propellers, shafting, control and safety systems.

For more information on
MAN B&W Diesel
Circle 6 on Reader Service Card

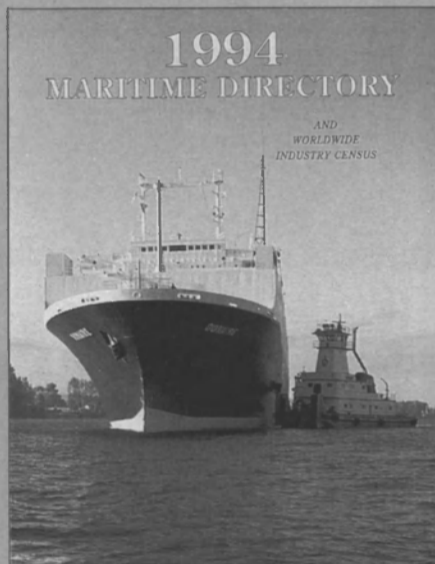
Cincinnati Gear, TF-40 Gas Turbine Package Helps Drive Ferry To 43 Knots

Austal Ships' latest catamaran fast ferry recently completed ship trials. The vessel features two Cincinnati Gear MA-107 marine reduction gearboxes, each powered by an Allied Signal TF-40 gas turbine. The 131-ft. (40-m) fast ferry, to be deliv-

International Maritime Directory Available

For a comprehensive directory of the international maritime community, order the "1994 Maritime Directory & Worldwide Industry Census." Produced by the publishers of *Maritime Reporter & Engineering News*, this directory includes a wealth of "need-to-know" information, with complete listings of: International Vessel Owners/Managers; U.S. Vessel Owners/Managers; U.S. Shipbuilders & Repairers; International Shipbuilders & Repairers; and Marine Suppliers of Equipment and Services. For information on receiving a copy, call (212) 477-6700; fax: (212) 254-6271; or

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1995 MARINE PROPULSION SELECTION GUIDE

ered to Yuet Hing Marine Supplies of Hong Kong, is capable of full-load cruising speeds of 43 knots.

The propulsion systems on the Yuet Hing fast ferry feature Cincinnati Gear's Cin-Tec Control System, which monitors and controls operation of the MA-107 gearbox and its relationship with other propulsion systems components. The Cin-Tec Control System is available for all Cincinnati Gear marine reduction gearboxes.

The MA-107 is one of Cincinnati Gear's "MA" Series of turbine powered marine reduction gear. The MA-107 is a vertical offset, parallel shaft reduction gear, featuring modular construction and a cast aluminum housing.

For more information on the MA series from Cincinnati Gear
Circle 8 on Reader Service Card

MAN B&W Two-Stroke Engine Generates 93,120 bhp

The new K98MC-C two-stroke engine from MAN B&W Diesel offers power outputs up to 68,520 kW (93,120 bhp) and reportedly inherits the economy and reliability of the manufacturer's stable of engines in the MC low speed program.

The 980 mm bore design is effectively a larger version of the K90MC/MC-C series, which is a popular engine in the Panamax and post-Panamax container propulsion market. A number of 5,000-TEU vessels contracted to be built for operators in Europe and East Asia have been specified with 12-cylinder K90MC and K90MC-C engines to help secure a sustained speed of 24 to 25 knots.

Key operating criteria for the K98MC-C are similar to those of the other MC engines, notably a mean effective pressure of 18.2 bar and a mean piston speed of 8.32 m/sec. A propeller speed requirement of 104 rpm was selected as the design basis, resulting in a stroke/bore ratio of 2.45 and a cylinder output of 5,710 kW (7,760 bhp).

The K98MC-C will be available in 9, 10, 11 and 12-cylinder versions. The new model marks a return by MAN B&W Diesel A/S to the 980 mm bore class. A considerable number of K98FF and K98GF types commissioned over 20 years ago are still in operation.

For more information on the K98MC-C
Circle 5 on Reader Service Card

K98MC-C design data

Bore	980 mm
Stroke	2,400 mm
Stroke/Bore ratio	2.45
Cylinders	9-12
Power/cylinder	5,710 kW (7,760 bhp)
Speed	104 rpm
Mean piston speed	8.3 m/sec.
Mean effective pressure	18.2 bar
Spec. fuel consump.	174 g/kWh (128 g/bhph)

Motor Coaster Uses Schottel Pump-Jet Bowthruster To Enhance Safety

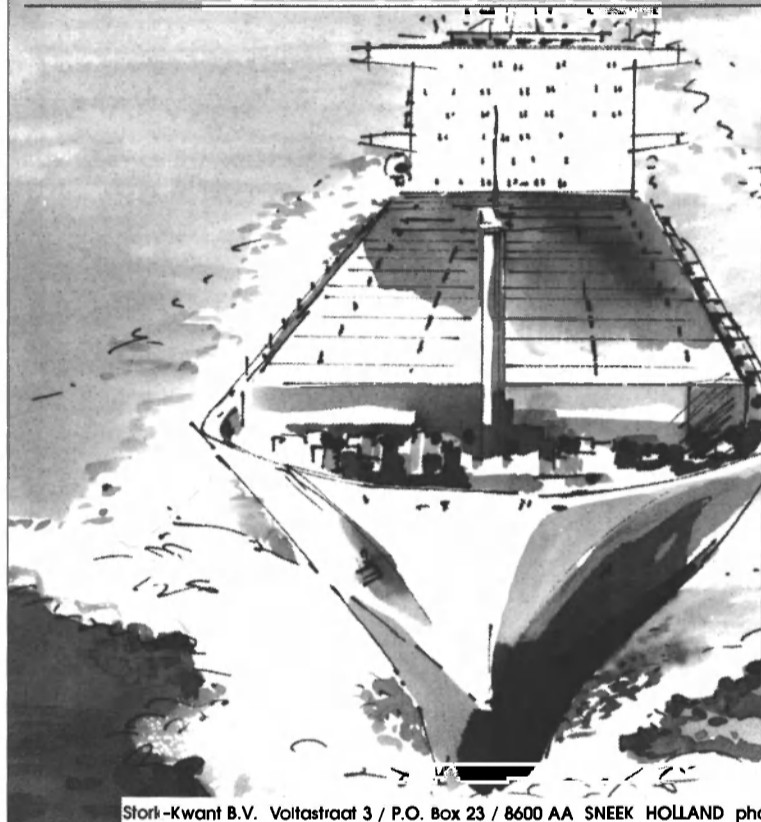
Japanese shipowner Shigeyoshi Akita — recognizing the safety and

maneuverability advantages — equipped its new motor coaster *No. 3 Tetsuryu-Maru* with a Schottel pump-jet bow maneuvering unit. The ship is designed to operate primarily in coastal areas, and a critical advantage of the Schottel Pump-Jet is its performance in these situ-

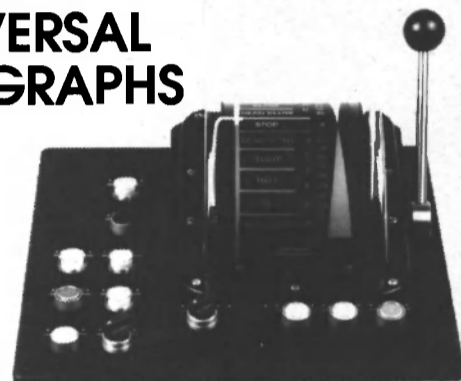
ations. The unit makes it possible to continue a voyage in the event of the failure of the main propulsion plant, helping to eliminate an emergency situation.

For more information on Schottel
Circle 7 on Reader Service Card

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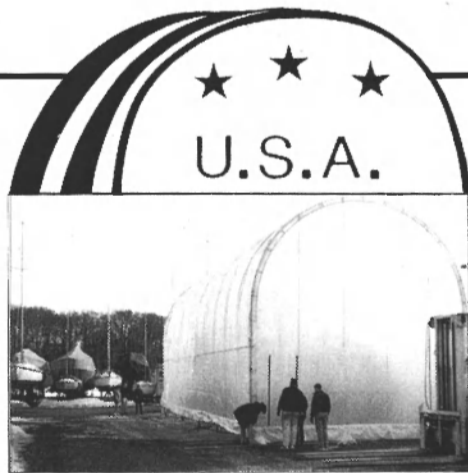
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Alta-Turbo To Market, Support Czech-Built Turbocharger

As of the fall of 1994, Alta-Turbo took over from PBS the complete responsibility for all sales and replacement parts for turbochargers, as well as product support services. PBS is still the manufacturer.

PTR turbochargers from PBS

Velka Bites in the Czech Republic are intended for use on supercharged diesel engines as well as oil, gas and heavy fuel engines with an output of 300 to 1,800 kW.

For more information from Alta-Turbo
Circle 9 on Reader Service Card

IMSSCO Appoints Singapore Distributor

Cal + Bern Safety Products &

Service Ltd. has been appointed the Singaporean exclusive distributor for the Maverick Foam Vest System by International Marine Supply & Service Co. (IMSSCO) of San Diego.

The Maverick Foam Vest System — which is U.L. listed and ABS type approved to SOLAS — will be demonstrated for the first time in Asia at the Maritime School for Training in Singapore.

The product is designed as an innovative portable foam

firefighting tool.

For more information on IMSSCO
Circle 17 on Reader Service Card

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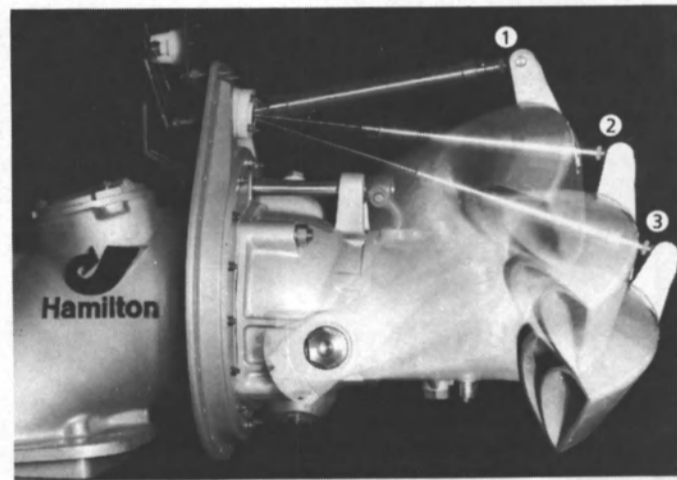
For more information on the TQ Environmental monitoring system
Circle 16 on Reader Service Card

Hydrasearch Offers New Hose & Fitting Catalog

Hydrasearch Co. released its new Marine Hose and Fitting Catalog 505, which contains the company's newest line of hose and fittings, which includes fittings under the groups MIL-H-24135/4 & /10, as well as MIL-H-24136/1 & /4. The equipment is used on shipboard fluid transfer systems for the U.S. and foreign navies.

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For a copy of the new catalog from Hydrasearch
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Circle 31 on Reader Service Card

Coming In March...

- **AWO ANNUAL:**

A inside look at the issues and people driving the inland and coastal markets.

- **SAFETY AT SEA:**

International Editor Alan Thorpe offers insight to recent rules and designs geared to help owners avoid disaster.

- **MARINE ELECTRONICS YEARBOOK:**

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SHIP & BOATBUILDING TECHNOLOGY

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Classification societies
publish
Rules For High Speed Craft

Following the adoption of a new Chapter 10 to the SOLAS Convention by the International Maritime Organization's (IMO) Safety Committee, which makes mandatory the International Code of Safety for High Speed Craft, EEIG Unitas member societies have completed the publication *Rules For High Speed Craft*. The requirements of the new IMO Code enter force on January 1, 1996.

EEIG Unitas, established in 1993 by Bureau Veritas (BV), Germanischer Lloyd (GL) and Registro Italiano Navale (RINA), exists to enhance cooperation — particularly in the areas of research and development, classification rules and surveyor training.

As BV, GL and RINA already had their own rules for high speed craft, the new international code meant that these were required to be updated. According to EEIG Unitas, cooperation among the three in preparing the new rules avoided duplication of efforts and resources, while tapping each member's strengths.

The Letter Of The Law

The new EEIG Unitas rules are for application as a complete set of comprehensive requirements, covering the design and construction of high speed craft engaged on both international and national voyages, the equipment which should be provided, and the conditions for their operation and maintenance. The new rules include:

- The International Code of Safety for High Speed Craft - Adopted by IMO in May 1994, it will be made mandatory January 1, 1996. It is anticipated that the code will be used by flag administrations as the basis for defining regulations applicable to high speed craft flying their flag and engaged on national voyages.

- The Classification Requirements - These specify the design, construction and maintenance rules that must be complied with for high speed craft to fulfill the general requirements of the IMO Code.

The IMO Code specifies a gen-

eral obligation for high speed craft to have a structural strength capable of withstanding static and dynamic loads, and which can act under all permitted operating conditions. Classification rules fully define the detail of materials, dimensions and



Classed with Bureau Veritas, the Corsaire 6000 fast passenger/car ferry *Emeraude* entered service between St. Malo and Jersey in May 1994. Built at Leroux & Lotz, the deep-V monohull is built completely of light aluminum alloy and has a top speed of 34 knots.

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designs which can ensure fulfillment of this general obligation by each individual craft. Combined implementation of these requirements makes it possible to build, approve and operate high speed craft within the required safety levels.

For classification purpose, each craft is subject to the following surveys:

- An initial survey before the craft is put into service, or before the class certificate is issued for the first

time;

- A periodical (annual) survey within three months before/after the anniversary date of the certificate;

- A renewal (special) survey at intervals specified by the society, but not exceeding five years.

Renewal and periodical surveys include a bottom survey in dry conditions, and other surveys (such as tailshaft, boiler surveys and surveys of additional class notations) are required according to the soci-

ety rules.

A Permit to Operate High Speed Craft is also required before it should operate commercially. The permit is issued by the flag administration after consultation with each port state associated with the operation of the craft, concerning any operational conditions that may require to be applied.

For more information on EEIG Unitas
Circle 10 on Reader Service Card

For more information on Bureau Veritas
Circle 11 on Reader Service Card

For more information on Germanischer Lloyd
Circle 23 on Reader Service Card

For more information on Registro Italiano Navale
Circle 24 on Reader Service Card



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"NO! I DON'T THINK IT'S THE INFLATIONARY ECONOMICS."

Title XI Requests Keep Coming

The demand for Title XI financing remains strong among potential ship owners — both domestic and foreign — which seek to build new vessels in U.S. shipyards. The following are the latest requests for Title XI guarantees, including proposed ship type, owner, contract amount and builder.

Type: Paddlewheel Steamboat
Contract: \$73.2 million
Builder: McDermott

The Maritime Administration (MarAd) has received an application from Delta Queen Steamboat Development, Inc., Chicago, Ill., for a Title XI guarantee to aid in financing the construction of one 436-passenger paddlewheel steamboat. The vessel would be built by McDermott Inc., Amelia, La., and operated in the inland waterways of the Continental U.S. The scheduled delivery date is April 1995. The requested guaranteed amount is \$64,010,000 or 87.5 percent of the total estimated actual cost of \$73,153,899, with a term of 25 years.

Type: Luxury Commercial Charter Yacht
Contract: \$16 million
Builder: Swiftships

MarAd has received an application from NGS Enterprises, Inc., Morgan City, La., for a Title XI guarantee to aid in financing the construction of one luxury commercial charter yacht. The vessel would be built by Swiftships, Inc., Morgan City, La., and operated in the Western Mediterranean of Spain, France and Italy. The vessel was delivered in August 1994. The total estimated actual cost is \$16 million.

Type: Power Generating Barge
Contract: \$75.46 million
Builders: Wartsila Diesel/Amfels

Jamaica Energy Partners, L.P., Jamaica, Wis., asked MarAd for a Title XI guarantee to aid in the construction of one power generating barge. The vessel would be built by Wartsila Diesel Inc./Amfels, Annapolis, Md. The vessel would be delivered in May 1995. The requested guarantee amount is \$65,000,000 of

the total estimated actual cost of \$75,460,000. The guarantee term would be 20 years.

Type: (7) Refrigerated Cargo Vessels
Contract: \$181.5 million
Yard: Bender Shipbuilding & Repair

Holding Company Dalmore Produkt, Vladivostok, Russia, has asked MarAd for a Title XI guarantee to aid in the construction of seven 374-ft. (114-m) refrigerated cargo vessels. The proposed builder is Bender Shipbuilding & Repair Co., Inc., Mobile, Ala.. The vessels would operate in the U.S., Japan, and Russia. The first vessel would be delivered in April 1996, the second would be delivered four months later, and the third through seventh vessels would be delivered in three-month intervals thereafter. The requested guarantee amount is \$154,258,000 of the total estimated cost of \$181,480,000, with a 25 year term.

Type: Z-drive Tugs
Contract: \$7.7 million
Yard: Runyan Shipyard

Tugz International L.L.C., Cleveland, Ohio, has asked MarAd to aid in the construction of two twin Z-drive reverse tractor harbor/escort/towing tugs. The proposed shipbuilder is Runyan Shipyard, Inc., Pensacola, Fla.. The vessels would operate in the vicinity of south Lake Michigan, including the ports of Chicago, Indiana Harbor, Burns Harbor and Gary. Both tugs are scheduled to be delivered in January 1996. The requested guarantee amount is \$6,717,375 of the total estimated actual cost of \$7,677,000, with a term of 25 years.

MarAd Port Development Study Now Available

The Maritime Administration has released the publication *United States Port Development Expenditure Report* which analyzes the results of an American Association of Port Authorities (AAPA) capital expenditure survey performed in 1993. This report is the fourth in a series that continues the capital expenditure survey initiated by the Port Authority of New York and New Jersey. This year's survey is unchanged from that of a year ago when several changes designed to improve the usefulness of the information were incorporated. Those changes included additional expenditure categories to better define the type of investments being made. It should be noted that AAPA now includes the Virginia Port Authority with the South Atlantic region, instead of the North Atlantic. As a result, all expenditure data prior to 1993 was adjusted to reflect this change. Limited copies are available from MarAd's Office of Ports and Domestic Shipping, 400 7th St., SW, Washington, D.C. 20590, or tel: (202) 366-4357.

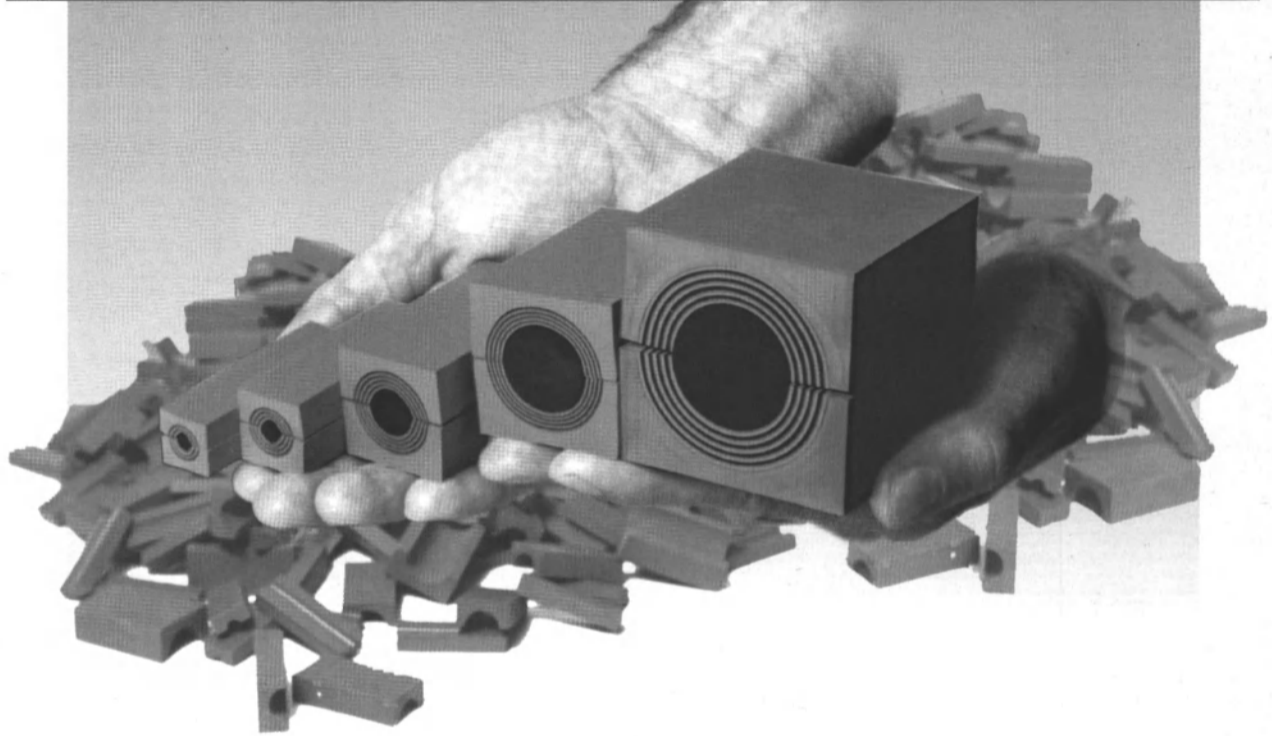
Intermodal Report Available

The Maritime Administration has announced the availability of the updated report, *Inventory of American Intermodal Equipment, 1994*. Prepared by MarAd's Office of Port and Domestic Shipping, the report records the intermodal equipment of 11 U.S.-flag marine carriers and 13 leasing companies operating in the U.S. Leasing companies are added

to the report once their inventories exceed a predetermined number of units of intermodal equipment. The containers listed are controlled by the carrier, i.e., the unrestricted ability of the carrier to manage utilization of the containers. These controlled containers could be owned, leased, or both. The report is divided into three major sections. Section one provides a series of statistical tables and findings summarizing the intermodal equipment

capabilities of the U.S. Sections two and three contain the individual U.S.-flag carrier and leasing company equipment inventories. These include containers, chassis, RoRo trailers, and vessels/oceangoing barges. Copies of the report are available upon request from MarAd's Office of Port and Domestic Shipping, tel: (202) 366-4357, or the Office of External Affairs, Rm. 7219, 400 Seventh St., SW, Washington, D.C. 20590.

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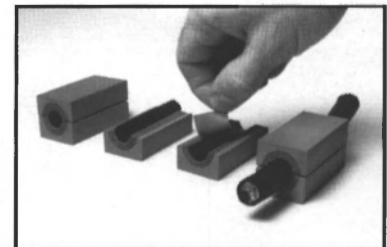
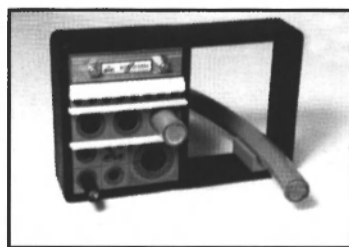
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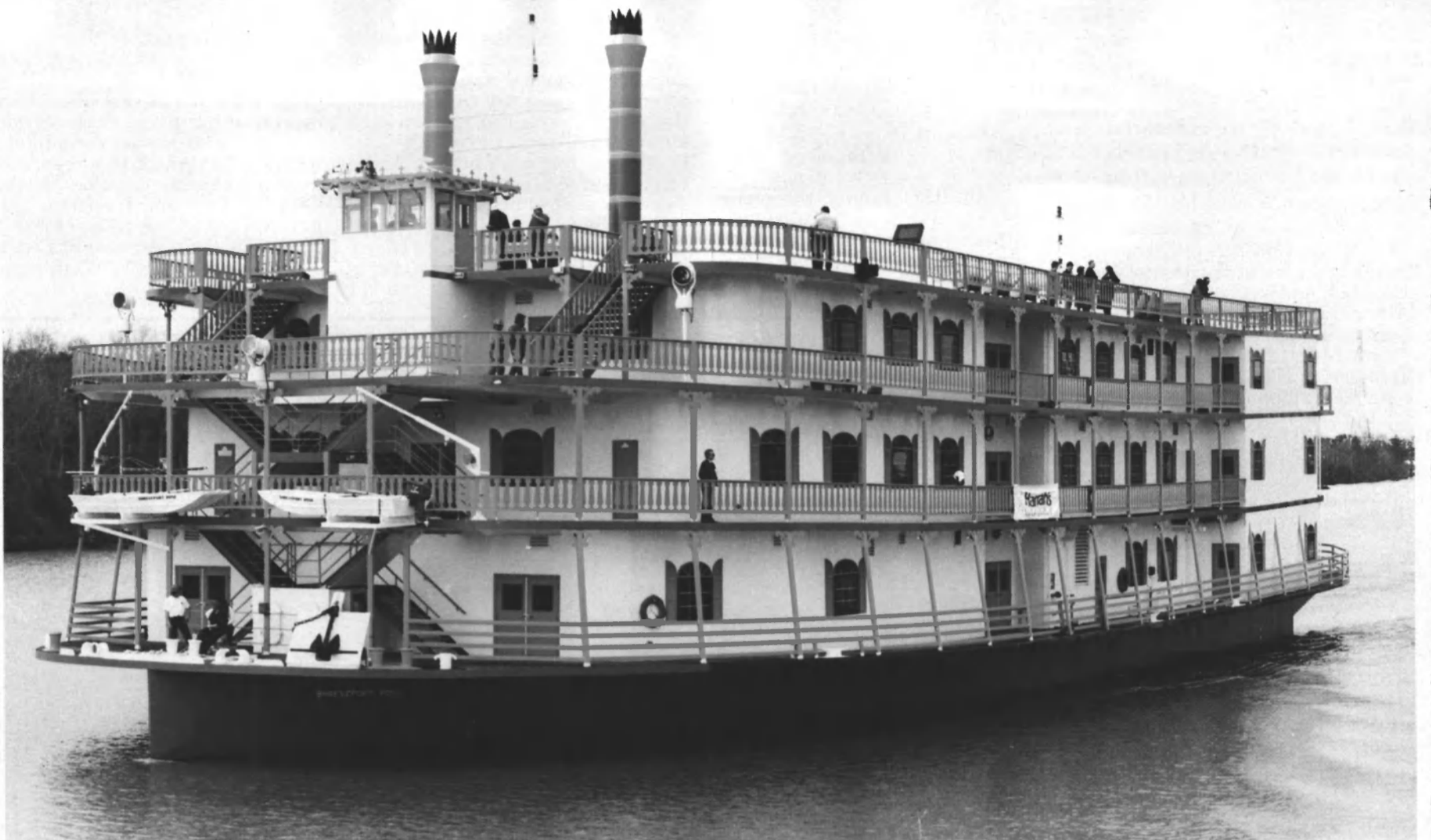
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Southern Marine Industry News Roundup

Louisiana SUNY Maritime Alumni To Hold Luncheon

The Louisiana Chapter of the State University of New York Maritime College Alumni Association is co-sponsoring a luncheon with the World Club of New Orleans with Rear Adm. **Robert North**, 8th District Commander of the U.S. Coast Guard, as guest speaker. The luncheon will be held at the Plimsoll Club in downtown New Orleans on March 15, 1995. Reservations are required and may be made via fax to **Lauryn Johnson** at tel: (504) 838-6811; or contact **Cliff Johnson**, president of the Louisiana Chapter, at tel: (504) 529-8400.

Trinity To Build Navy Oceanographic Vessel; Delivers Foreign Crew Vessels

Trinity Marine Group's Halter Marine won a \$47.2 million contract for building a T-AGS 60 oceanographic research ship for the U.S.

Navy — nearly identical to the other T-AGS 60 class ships already under construction by Trinity.

Trinity's Aluminum Boat subsidiary delivered two 85-ft. (25.9-m), all-aluminum crewboats, the *Maleo* and the *Pipit*, to P.T. Baruna Raya Logistics of Jakarta, Indonesia. Each vessel is powered by twin Caterpillar 3412 DITA diesels driving five-blade propellers through Twin Disc reverse/reduction gears.

Insulations Inc. & Trinity Work Together On *Flamingo*

The *Flamingo Casino*, a 325-ft. (99-m) sternwheeler riverboat casino constructed by the Trinity Marine Group for Hilton Hotels Corp. and New Orleans Paddlewheels, benefited from the contributions of Insulations, Inc., a marine contractor based in New Orleans. Trinity's Equitable Shipyard built the four-deck *Flamingo* with 30,000 sq. ft. of gaming space and a passenger ca-

capacity of 2,400. Rodney E. Lay was the naval architect for the project.

Insulations Inc. was involved in the installation of a fire boundary, thermal, acoustical and mechanical system, engine exhaust and boiler stack insulations, and interior finishes. The interior work performed by Insulations Inc. included installation of joined and sheathing for bulkheads, overheads, and wall finishes, as well as the architectural ceiling systems including soffits, furr downs, coffers and molding.

For more information on insulations Inc. Circle 131 on Reader Service Card

For more information on Trinity Circle 132 on Reader Service Card

Service Marine Building Single-Deck, Glass-Enclosed Vessel

Service Marine Industries of Morgan City, La., is currently working on a 240-ft. (73-m) dinner/cruise

vessel for Premier Yachts, Inc. of Chicago. The vessel will be a single-deck, glass-enclosed vessel (for more information, see *Maritime Reporter/Engineering News*, Jan. 1995, p. 28). The vessel will serve the Washington, D.C. area after its delivery, which is scheduled for May 1995. The vessel is designed to carry 600 passengers. The vessel is reportedly representative of the "Seine River" type of vessel used in Europe.

For more information on Service Marine Circle 130 on Reader Service Card

Bollinger Builds AMBAR RIBs

Bollinger Machine Shop & Shipyard of Lockport, La., is reportedly building a series of Rigid Inflatable Boats (RIBs) in the U.S. — called ALsafe Severe Service/Rescue Boats — from a design of AMBAR Marine of Lafayette, La. The RIBs are available in standard lengths between 18 ft. (5.5 m) and 29.5 ft. (9 m).

For more information on Bollinger Circle 134 on Reader Service Card



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Circle 314 on Reader Service Card

OIL SPILL RESPONSE TECHNOLOGY

1995 International Oil Spill Conference And Exposition

Feb. 27 - March 2, 1995

The 1995 International Oil Spill Conference and Exposition will be held from Feb. 27 - March 2, 1995 at the Long Beach Convention Center in Long Beach, Calif.

It is sponsored by the American Petroleum Institute, the Environmental Protection Agency (EPA), the International Maritime Organization (IMO) and the International Petroleum Industry Environmental Conservation Association (IPIECA).

This year's discussions touch on issues such as oil transport, evolving management and mitigation techniques, international cooperation and preparedness, and emerging technologies.

In addition to an extensive exhibitors list, the show reportedly attracts more than 1,800 participants from 37 different countries and offers more than 250 displays from suppliers of oil and oil spill response related equipment and services.

After Feb. 13, 1995, anyone interested in attending the event must register on-site at the Long Beach Convention Center.

For more information on exhibiting, contact Trade Associates, Inc., tel: (301) 468-3210. For more information on the conference, tel: (202) 639-4202.

Exhibitor List (partial)

3M Environmental Safety Products
 ABASCO
 American Eagle Mfg.
 American Marine, Inc.
 BMT Portland Coastal/NETE
 Compliance Systems
 Exxon Chemical Company
 Fast Engineering Ltd.
 Foss Environmental Services Co.
 Frank Mohn Houston Inc.
 Haz-Mat
 Hyde Products
 IPIECA
 JBF Scientific Company
 Kvaerner Eureka AS
 Kvichak Marine Industries
 Magnavox Electronic Systems
 Marco Pollution Control
 Marine Response Alliance
 Marine Spill Response Corp.
 Maritime Bureau Inc.
 Maritime Reporter & Engineering News
 Matarah Industries
 National Pollution Funds Center
 OHM Remediation Services Corp.
 Oil Mop, Inc.
 Oil Spill Response, Ltd.
 Oil Stop, Inc.
 Ro-Clean International
 Sea-Fab Inc.
 Slickbar Products Corporation
 Sorbent Products Co., Inc.
 SpillNet, Inc.
 Trimble Navigation
 TRW, Inc.
 Unitor AS
 Unitor Enviro Team
 VIKOMA

Donjon To Expand

Donjon/CV, based in New Jersey, said it intends to expand its emergency response capabilities to open-ocean, level E coverage as defined by OPA 90. "Having more than 700 tank vessels currently enrolled in our salvage, firefighting and light-erage response system, we find many of our customers are seeking a more cost-effective, comprehensive and professional alternative to satisfy OPA 90 responsibilities," said **Arnold Witte**, president of Donjon. The timetable for the proposed expansion is to provide services to terminal and vessel operators along the U.S. east coast by August of 1995. Full coverage for the contiguous U.S. is expected to be available by Jan. 1, 1996.

For more information on Donjon/CV
 Circle 74 on Reader Service Card

Crowley, Tidewater, Foss Get MINI Modules

Marine Industries Northwest Inc. (MINI) recently designed, built and delivered several portable modular ship structures to meet emerging U.S. Coast Guard (USCG) requirements. Among the companies who have received modules are Crowley Marine Services, Tidewater, and Foss Maritime. The marine modular unit configurations included spill worker berthing, galley office, spill communications command control, and utility power. According to MINI, the units allow responders to retain ownership of specialized marine functions and control, via portability and module deployment to

augment vessels and thereby enhance fleet response capabilities.

The impetus behind the modular ship structure proceeds from recent interpretations of OPA 90 that extend spill response coverage farther offshore into ocean areas. Vessels and barges deployed in such activities are subject to USCG requirements for Certificates of Inspection (COI). This new interpretation means many response fleet vessels need to meet stringent regulatory standards for crewed ocean operations.

For more information on MINI
 Circle 114 on Reader Service Card

Magnavox Spill Response Software Helps Crews

Magnavox Electronic Systems Co. offers a new product called OSARMS (Oil Spill Automated Response Management System), a high-powered software system for oil spill prevention, containment and control.

The program incorporates a Unified Command Structure (UCS), Geographic Information System, response management tools, financial management features and even media and public relations guidance as well as on-line federal, state, local and corporate legal regulations. The system also runs in a training mode, so a crisis management team can conduct and document drills and crisis simulations. The software also tracks/models spills, predicts oil spill flow, *in situ* burning, air plume modeling and natural resource damage assessment (NRDA).

For more information on Magnavox
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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.

ABRASIVES

Ervin Industries, Inc., 3893 Research Park Drive Ann Arbor, MI 48106-1668
Myers, Metals, & Minerals, 801 Second Ave., Suite 1505, Seattle, WA 98104

ABSORBENTS

Haz Mat Response, 5841 Box Canyon Rd., La Jolla, CA 92037

ADHESIVES

Lite Industries, Corp., 205 Sweet Hollow Rd., Old Bethpage, NY 11804

AIR CONDITIONING AND REFRIGERATION—Repair & Installation

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Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21811
Carrier Transcold, P.O. Box 4805, Syracuse, NY 132211
Johnston Brothers, 180 Enterprises Avenue, Patterson, LA 70392
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

ALARMS, FACTORY MUTUAL-APPROVED

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ALUMINUM BOATS

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Chemplex Environmental Prod., Inc., 3405 Highway 33, Neptune, NJ 07753

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Automation Products, Inc., 3030 Max Roy, Houston TX 77006

BALLAST

Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste. 203 Tucson, AZ 85714

BARGE BUILDING

Conrad Industries, P.O. Box 790, Morgan City LA 70381

BASKET STRAINERS

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

BEARING—Rubber, Metallic, Non-Metallic

B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY;
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363p., -0168
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orion Corp., 111 Cedar Creek Rd., Grafton, WI 53024
Thordon Bearings Inc., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

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Northstar Marine, 84 Wall Street, Farmingdale, NY 11735

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Thrustmaster of Texas P.O. Box 840189 Houston, TX 77284-0189

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151 Maritime Services, 34062 El Encanto/B, Dana Pt. CA 92629
Captain Astad Company, Inc., P.O. Box 350486, Ft Lauderdale, FL 33335
Emerald Yacht & Ship Brokers, 759 N. Milwaukee St., # 552, Milwaukee, WI 53202
Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BULKHEAD SEALS

Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY;
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

CABINETRY

Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

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Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

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Chand Corporation, 157 Hwy 654, Matthews, LA 700375
Creative Systems, Inc., P.O. Box 1910, Port Townsend, WA 98368
Intergraph Corporation, 2051 Mercator Drive, Reston, VA 22091-3413
Kockums Computer Systems AB, PO Box 50555, s-202 15 Malmo, SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
TIMSCO, P.O. Box 91360, Mobile AL 36691

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Electronic Design Inc., 3020 20th St., Metairie, LA 70002
Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123
Kobelt Mfg. Co. 11720 Horseshoe Way, Richmond, BC, CANADA V7A 4V5
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
MMC International, 60 Inip Dr, Inwood NY 11696
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
Teleflex Naval Technologies, 205 Church Rd., North Wales, PA 19454

CONTROL SYSTEM—Steering

Engine monitor, Inc., 179 Hickory Avenue Harahan, LA 70123
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Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

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Vancouver Shipyards, 50 Pemberton Ave., N. Vancouver, B.C. CANADA V7P 2R2

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Klehma Rubber Engineering, GERMANY
U.S. Rep: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

COUPLINGS

American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882
Holset Engineering, 1320 Kemper Meadow Drive, Cincinnati, OH 45240
Lo-Rez Vibration Control Ltd., 186 West 8th Avenue, Vancouver, BC
CANADA, V5Y1N2
Mapeco Products, 90 Forest Avenue, P.O. Box 382, Locust Valley, NY 11580
Ovako Steel Inc., 1447 New Litchfield St, Torrington, CT 06790

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Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Macgregor USA 20 Chapin Rd., Pine Brook, NJ 07058
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
J. D. Neuhaus Hebezeugue GMBH, D-5810 Witten, GERMANY
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

CRANES

AmClyde, 240 E. Plato Blvd., Saint Paul, MN 551071609
Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801
Morgan Marine, 1300 Normandy Place, Santa Ana, CA 92705
Pallinger Inc., 8040 Dorchester Rd., Niagara Falls, Ontario, CANADA L2E 6V6
Tech Crane Int'l., Inc., 61130 Timberbend Dr., Lacombe, LA 70445

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Lakeshore Inc., PO Box 809, Iron Mountain, MI 49801
MacGregor-Navire Group, 34 Bedford Rd., Clapham North, London SW4 7HH
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032
Smith Berger Marine Inc., 516 South Chicago Street, Seattle, WA 98108
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Hawbolt Ind., Hwy 3, P.O. Box 80, Chester, Nova Scotia, CANADA BOJ 1J0
Lakeshore, Inc., PO Box 809, Iron Mountain, MI 49801
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
NEI Clarke Chapman Canada, 1075 N. Service Rd. W., Unit 4, Oakville, Ontario, CANADA L6M 2G2
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Pusnes, PO Box 102, N-4818, Faerrik, NORWAY
Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108
Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

DECK STRUCTURES/ CONTROL CABS

Carolina Cockpit PO Box 83037, Portland, OR 97283

DESALINATION - REVERSE OSMOSIS

Rochem Separation Systems, Inc., 3904 Del Amo Blvd., Ste. 801, Torrance, CA 90503
Rochem Separation Systems, P.O. Box 156, 54 Rue Agasse, 1211 Geneve 17, SWITZERLAND

DIESEL ACCESSORIES

General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360
Hatch & Kirk Inc., 601 McFarland Rd., Houston, TX 77011
Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101

DIESEL ENGINE — Spare Parts & Repair

ABB Industry Oy, 100 Madison Corp. Park Rte.6, Brewster, NY 10509
Alaska Diesel, 4420 14th Ave. NW, Seattle, WA 98107
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610
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 61265
Diesel Engine & Parts Co., 8123 Hillsboro Ave., Houston, TX 77029
Giro Engineering Ltd, Talisman, Duncan Road, Park Gate, South Hampton, SO3 7BX ENGLAND

Goltens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231

Hatch & Kirk Inc., 601 McFarland Rd., Houston, TX 77011

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

MAN B&W Diesel AG, Stadtbachstrasse 1, D-86153 Augsburg 1, GERMANY

MAN B&W Diesel A/S, Tegholsmøsgade 41, DK-2450 Copenhagen SV, DENMARK

MAN B&W Diesel, 17 State St., New York, NY 10004

MTU of North America, 10450 Corporate Dr., Houston, TX 77478

Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY

Motor-Service AB, Box 2115, S-144 04 Ronninge, SWEDEN

Motor Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315

New Sulzer Diesel US Inc., 525 Washington Blvd., Ste 2408, Jersey City, NJ 07310

Ocean Power 571 Central avenue, New Providence, NJ 07974

Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW, ENGLAND

Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084

Ulstein Bergen AS, PO Box 924, N5002 Bergen, NORWAY

Wartsila Diesel, 201 Delense Highway, Annapolis, MD 21401

DIVING & SALVAGE

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

H.J. Merrin, P.O. Box 23123, New Orleans LA 70183

Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOORS - MARINE & INDUSTRIAL

Insulations, Inc., 1101 Edwards Ave. Harahan, LA 70123

Mapeco Walz & Krenzer, Inc., 90 Forest Ave., Locust Valley, NY 11560

Maritime Services Corp., 3457 Guignard Drive, Hood River OR 97031

DRILLING & BLASTING

Marine Drilling & Blasting, PO Box 10455, Jacksonville, FL 32247-0455

DRY DOCKS—Design

Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381

North Florida Shipyards, P.O. Box 3255, Jacksonville, FL 32206

ELECTRICAL EQUIPMENT

Jo-Kell, Inc., 1011 W. 25th St. Norfolk, VA 23517

L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150

MMC International, 60 Inip Dr, Inwood NY 11696

ELECTRICAL WIRE DEVICES

Meltric Corp., 1935 Ace World Wide Lane, Cudahy, WI 53110

ELECTRONIC DISPLAY

Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

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

ELECTRONIC INFORMATION SUPPORT

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

EMISSION CONTROLS

Haldor Topsoe Nymollev 55, DK-2800, Lyngby, Denmark

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

EMPLOYMENT

Boat Crews, 1 Seine Court, Suite 309, New Orleans, LA 70114

ENGINEERING SERVICES

AmClyde, 240 E. Plato Blvd., Saint Paul, MN 551071609

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

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

ENGINE ROOM LIGHTING

Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581

ENGINE TEST EQUIPMENT

General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Rd., Plymouth, MA 02360

Instruments, Computers, & Controls, Inc., 6942 Haven Creek Dr., Katy, TX 77449

ENVIRONMENTAL SYSTEMS

Foss Environmental Services, 7440 West Marginal Way So., Seattle, WA 98101

EPIRBs

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale FL 33310-5247

Alden Electronics, 40 Washington St., Westborough, MA 01581

EQUIPMENT - Marine

Bohnet & Associates, 1150 Rue Rochelle, Slidell, VA 70458

EVAPORATORS

Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974

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

NEI Clarke Chapman Canada, 1075 N. Service Rd. W., Unit 4, Oakville, Ontario, CANADA L6M 2G2

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Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Schuyler Mfg. Co., Inc., 16901 Woodinville-Redmond Rd., Woodinville, WA 980

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., 340 Lehigh Ave., Perth Amboy, NJ 08861

OIL SPILL RESPONSE TECHNOLOGY

1995 International Oil Spill Conference And Exposition

Feb. 27 - March 2, 1995

The 1995 International Oil Spill Conference and Exposition will be held from Feb. 27 - March 2, 1995 at the Long Beach Convention Center in Long Beach, Calif.

It is sponsored by the American Petroleum Institute, the Environmental Protection Agency (EPA), the International Maritime Organization (IMO) and the International Petroleum Industry Environmental Conservation Association (IPIECA).

This year's discussions touch on issues such as oil transport, evolving management and mitigation techniques, international cooperation and preparedness, and emerging technologies.

In addition to an extensive exhibitors list, the show reportedly attracts more than 1,800 participants from 37 different countries and offers more than 250 displays from suppliers of oil and oil spill response related equipment and services.

After Feb. 13, 1995, anyone interested in attending the event must register on-site at the Long Beach Convention Center.

For more information on exhibiting, contact Trade Associates, Inc., tel: (301) 468-3210. For more information on the conference, tel: (202) 639-4202.

Exhibitor List (partial)

3M Environmental Safety Products
 ABASCO
 American Eagle Mfg.
 American Marine, Inc.
 BMT Portland Coastal/NETE
 Compliance Systems
 Exxon Chemical Company
 Fast Engineering Ltd.
 Foss Environmental Services Co.
 Frank Mohn Houston Inc.
 Haz-Mat
 Hyde Products
 IPIECA
 JBF Scientific Company
 Kvaerner Eureka AS
 Kvichak Marine Industries
 Magnavox Electronic Systems
 Marco Pollution Control
 Marine Response Alliance
 Marine Spill Response Corp.
 Maritime Bureau Inc.
 Maritime Reporter & Engineering News
 Matarah Industries
 National Pollution Funds Center
 OHM Remediation Services Corp.
 Oil Mop, Inc.
 Oil Spill Response, Ltd.
 Oil Stop, Inc.
 Ro-Clean International
 Sea-Fab Inc.
 Slickbar Products Corporation
 Sorbent Products Co., Inc.
 SpillNet, Inc.
 Trimble Navigation
 TRW, Inc.
 Unitor AS
 Unitor Enviro Team
 VIKOMA

Donjon To Expand

Donjon/CV, based in New Jersey, said it intends to expand its emergency response capabilities to open-ocean, level E coverage as defined by OPA 90. "Having more than 700 tank vessels currently enrolled in our salvage, firefighting and lighterage response system, we find many of our customers are seeking a more cost-effective, comprehensive and professional alternative to satisfy OPA 90 responsibilities," said **Arnold Witte**, president of Donjon. The timetable for the proposed expansion is to provide services to terminal and vessel operators along the U.S. east coast by August of 1995. Full coverage for the contiguous U.S. is expected to be available by Jan. 1, 1996.

For more information on Donjon/CV
 Circle 74 on Reader Service Card

Crowley, Tidewater, Foss Get MINI Modules

Marine Industries Northwest Inc. (MINI) recently designed, built and delivered several portable modular ship structures to meet emerging U.S. Coast Guard (USCG) requirements. Among the companies who have received modules are Crowley Marine Services, Tidewater, and Foss Maritime. The marine modular unit configurations included spill worker berthing, galley office, spill communications command control, and utility power. According to MINI, the units allow responders to retain ownership of specialized marine functions and control, via portability and module deployment to

augment vessels and thereby enhance fleet response capabilities.

The impetus behind the modular ship structure proceeds from recent interpretations of OPA 90 that extend spill response coverage farther offshore into ocean areas. Vessels and barges deployed in such activities are subject to USCG requirements for Certificates of Inspection (COI). This new interpretation means many response fleet vessels need to meet stringent regulatory standards for crewed ocean operations.

For more information on MINI
 Circle 114 on Reader Service Card

Magnavox Spill Response Software Helps Crews

Magnavox Electronic Systems Co. offers a new product called OSARMS (Oil Spill Automated Response Management System), a high-powered software system for oil spill prevention, containment and control.

The program incorporates a Unified Command Structure (UCS), Geographic Information System, response management tools, financial management features and even media and public relations guidance as well as on-line federal, state, local and corporate legal regulations. The system also runs in a training mode, so a crisis management team can conduct and document drills and crisis simulations. The software also tracks/models spills, predicts oil spill flow, *in situ* burning, air plume modeling and natural resource damage assessment (NRDA).

For more information on Magnavox
 Circle 115 on Reader Service Card

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CALENDAR

FEBRUARY

American Society of Naval Engineers (ASNE) Symposium - 21st Century Combatant Technology: February 16-17, Mississippi Coast Coliseum and Convention Center, Biloxi, Miss.
Contact: **Ronald Wood**, ASNE, P.O. Box 337, Pascagoula, Miss. 39567-0337, tel: (601) 935-3930.

Cruiser, Destroyer & Frigate Symposium: February 16-17, Biloxi, Miss.
Contact: American Society of Naval Engineers (ASNE), fax: (703) 836-7491.

1995 Miami International Boat Show: February 16-22, Miami Beach Convention Center, Biscayne Bay Marriott Marine, Watson Island. Contact: tel: (305) 448-7450.

11th Fast Ferry International Conference: February 21-23, Hong Kong Convention & Exhibition Centre, Hong Kong
Contact: Giles Clark, Fast Ferry International Conference, 5 Admirals Walk, Golford Rd., Beneden, Kent, U.K. tel: +44 580 240202, fax: +44 580 240098

The American Association of Port Authorities (AAPA) Port Authority and Information Technology Seminars: February 22-24, Houston, Texas.
Contact: AAPA, 1010 Duke St., Alexandria, VA 22314, tel: (703) 684-5700, fax: (703)684-6321.

Oil Spill Conference: February 25-March 5, Sheraton Long Beach/Holiday Inn Hotel/Hyatt Regency & Renaissance Hotel, Long Beach, CA
Contact: API, 1220 L. Street, N.W., Washington, D.C. 20005, tel: (202) 662-8000; fax: (202) 682-8223.

1995 International Oil Spill Conference: Prevention, Behavior, Control and Cleanup of Oil Spills: February 27-March 2, Long Beach Convention Center, Long Beach, CA
Contact: **CDR Bob Pond**, U.S. Coast Guard, (G-MEP), Room 2100, 2100 Second Street, S.W., Washington, D.C. 20593, tel: (202) 267-6860; fax: (202) 267-4065.

SAE International Congress and Exposition: February 27-March 2, Cobo Hall, Detroit, MI.
Contact: **Colette Wright**, SAE staff engineer, tel: (412) 776-4841; fax: (412) 776-1830

SPE/IADC Drilling Conference: February 28-March 2, Amsterdam
Contact: SPE, Office, 4 Mandeville Pl., W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

MARCH

PetroVietnam: March 1-3, Ho Chi Minh City
Contact: SPE, Office, 4 Mandeville Pl., W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

1995 Seatrade Cruise Shipping

Convention: March 7-10, Miami Beach Convention Center, Miami, FL

Contact: Seatrade North America Inc., Princeton Forrestal Village, 125 Village Blvd., Suite 220, Princeton, NJ 08540-5703, tel: (609) 452-9414; fax: (609) 452-9374.

Seatrade Cruise Shipping Convention: March 7-11, Miami Beach Convention Center, Hall D, Miami Beach, FL

Contact: **Michael Kazakoff**, Seatrade North America Inc., Princeton Forrestal Village, 125 Village Boulevard - Suite 220, Princeton, NJ 08540-5703.

SPE Middle East Oil and Gas Conference: March 11-14, Bahrain
Contact: SPE, Office, 4 Mandeville Pl., W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

Ports '95 Conference: March 12-15, Tampa, FL

Contact: **James E. Sawyer**, Ports '95 Conference chairman, Greiner, Inc., 7650 West Courtney Campbell Causeway, Tampa, FL 33607-1462, tel: (813) 286-1711; fax: (813) 287-8591.

9th Annual U.S. Navy Logistics Symposium - Enhancing Fleet Effectiveness Through Logistics: March 14-16, Sheraton Los Angeles Airport Hotel, Los Angeles, CA

Contact: **Robert Calogero**, Naval Sea Systems Command (Code 04PT), 2531 Jefferson Davis Hwy.,

Arlington, VA 22242-5160, tel: (703) 607-1695; fax: (717) 607-2890.

SPE Joint Rocky Mountain Regional Meeting/Low Permeability Reservoirs Symposium: March 19-22, Denver, CO
Contact: SPE, Office, 4 Mandeville Pl., W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

International Gaming Business Expo (IGBE) '95: March 20-22, Sands Expo & Convention Center, Las Vegas, NV
Contact: IGBE, fax: (203) 838-3710.

SPE Asia Pacific Oil and Gas Conference: March 20-22, Kuala Lumpur
Contact: SPE, Office, 4 Mandeville Pl., W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

Committee on Petroleum Measurement: March 25-April 2, Westin Canal Place, New Orleans, LA
Contact: API, 1220 L. Street, N.W., Washington, D.C. 20005, tel: (202) 662-8000; fax: (202) 682-8223.

SPE/EPA Exploration & Production Environmental Conference: March 27-28, Houston, TX
Contact: SPE, Office, 4 Mandeville Pl., W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

Shipping '95: March 27-29, Sheraton Stamford, Stamford, CT
Contact: **Peter Casciano** or **Rikki Moran**, International Marketing Strategies, fax: (203) 622-1929.

APRIL

SASMEX International 95 - The Safety at Sea and Marine Electronics Conference, Exhibition and Safety Seminars: April 4-6, Hyatt Hotel on the Inner Harbor, Baltimore, MD
Contact: SASMEX, Queensway House, 2 Queensway, Redhill, Surrey, RH1 1QS, U.K., tel: +44 1737 768611; fax: +44 1737 760564.

American Waterways Operators (AWO) Spring Convention and Annual Membership Meeting: April 5-6, Washington, D.C.
Contact: AWO, fax: (703) 841-0389.

International Boatbuilders' Exhibition & Conference (IBEX) - West: April 9-11, Washington State Convention & Trade Center, Seattle, WA
Contact: CMC, tel: (800) 243-3238, (203) 852-0500; fax: (203) 838-3710.

19th Annual Marine/Offshore Industry Outlook Conference: April 11, Houston Marriott West Loop Hotel, Houston, TX
Contact: Sea Grant College Program, Texas A&M University, 1716 Briarcrest Dr., Ste. 702, Bryan, TX 77082, tel: (409) 845-3857.

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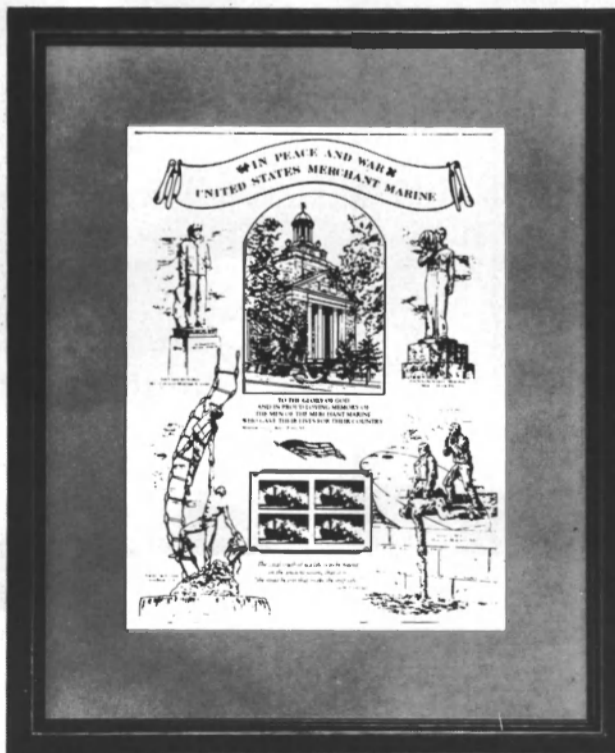
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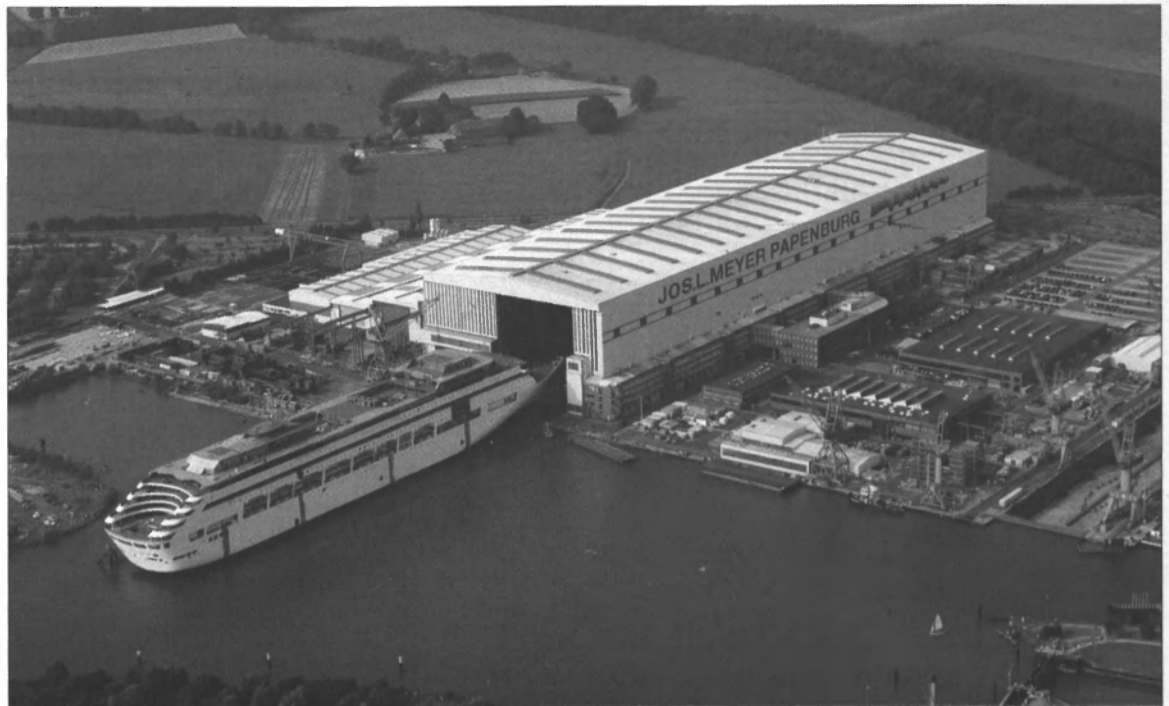
Meyer Werft Turns

200

Established in 1795, Meyer Werft Shipyard of Papenburg, Germany is celebrating its 200th anniversary this year.

The yard, renowned by owners and colleagues world round, is known for its dedication to quality ships efficiently produced. While the yard has built its considerable reputation building a variety of ship types, including gas carriers, livestock carriers and ferries, it has capitalized on the burgeoning cruise ship market. Its current orderbook includes three 70,000-gt cruise vessels for Celebrity Cruises (delivery 1995 through 1997); the 67,000-gt cruise vessel *Oriana* for U.K. owner P&O (delivery this spring); and a 6,000-gt passenger ship for the Republic of Indonesia (delivery in 1995), making it the 16th passenger vessel built for this island nation since 1983.

Up until after WWII, Meyer Werft chiefly built small, special purpose ships. Under the management of the brothers **Joseph-Franz** and **Godfried Meyer**, larger and technically more complicated ships were produced in the 1950s and 60s, such as gas tankers and car and passenger ferries. In 1974, the family enterprise ventured to make a new start, and within a few years an ultra-modern manufacturing business was set up. The year 1975 saw the completion of the first stage in the construction of the new shipyard, a stage which included a building berth and hull assembly shops, as well as associated buildings. The third stage of construction, completed in 1982/83, included the extension of hull assembly ships, a repair dockyard 787 ft. (240 m) x 115 ft. (35 m) and a central warehouse and workshops. Stage four, completed in 1986/87, entailed the construction of the covered building dock [hall: 885 ft. (270 m) x 333 ft. (101.5 m)/dock: 846 ft. (258 m) x 128 ft. (39 m)]; subsequently, the covered building dock was extended 328 ft. (100



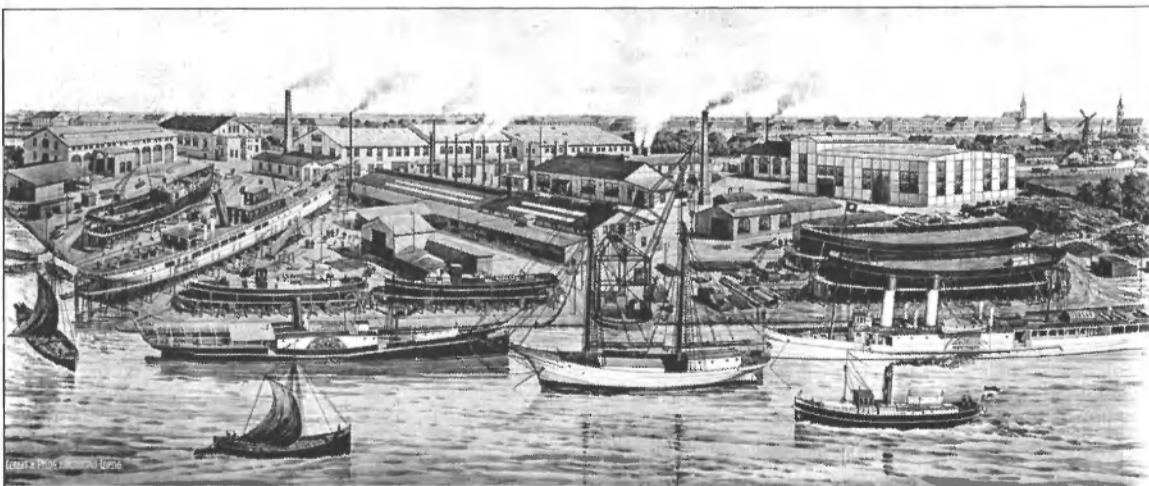
Floating out of the *Oriana*, the 67,000-gt cruise vessel for P&O. This is the fifth luxury liner to be built by Meyer Werft in Papenburg.

m) in 1990/91. The new shipyard was built in the immediate vicinity of the Papenburg sea lock, while at the same time building the first of six gas tankers for the Soviet Union. By 1983 the shipyard was complete, and by 1986 the move from the old shipyard was completed. Today the shipyard occupies approximately 233,000 sq. m., of which 83,000 sq. m. is under cover; and employs around 1,800. The current orderbook will keep the shipyard busy until the spring of 1997.

For more information on Meyer Werft
Circle 199 on Reader Service Card



Senior partner **Joseph-Franz Meyer** and his son **Bernard**, managing director of Meyer Werft in Papenburg.



MASCHINENFABRIK & SCHIFFSWERFT JOS. L. MEYER
PAPENBURG A/D. EMS

Newly constructed ships in the Meyer Werft shipyard at the start of the 20th Century. This lithography from the Leipzig art gallery Eckert & Pflug dates back to around 1910.

MEYER WERFT TIMELINE: KEY DATES

1795 - **Willm Rolf Meyer** buys the "Thurmwerft" on Papenburg's main canal for 815 Dutch guilders.

1857 - Under **Franz Wilhelm**, a total of 55 ships are have already been delivered, most of them wooden sailing snips, schooners and frigates.

1860s - **Franz Wilhelm's** son, **Joseph Lambert**, decides to become a shipbuilder. After a stay in the U.S., he attends the Royal School of Naval Architecture in Grabow. To complete his training, he works at the Vulcan shipyard at Stettin and is involved in the building of the first German armored ship made of iron, the *Preussen*.

1872 - With industrialist **Barth**, **Joseph Lambert Meyer** establishes "Barth & Meyer, Iron Shipyard, Iron Foundry & Engineering Works."

1874 - The *Triton*, the first passenger steam, is built by the shipyard.

1879 - Industrialist **Barth** withdraws his capital, and the company trades under the name of Jos. L. Meyer.

1909 - The first German motor tug is built.

1920/21 - The *Durazzo* freight steamer is built, which until 1951 was the largest vessel to be built at the yard.

1933 - The shipbuilding industry is centrally controlled by the National Socialists. Meyer Werft continues to build small, special purpose vessels.

1960 - The first gas tanker *Kirsten Tholstrup* is built.

early 1974 - Contract for six large gas tankers for Russia. The 67-ft. (20.5-m) beam of the vessel is too wide to get past the Papenburg railway bridge. Negotiations to broaden the bridge bog down, so the decision is made to build a new shipyard by the sea lock.

June 1974 - Excavation work on the new shipyard begins.

Feb. 1976 - The gas tanker *Yurmala* is delivered, the first ship built in the new shipyard.

1982/83 - Drydock built for repairs and conversions

Sept. 1985 - First cruise vessel, *Homeric* (42,092 grt), is launched.

1986/87 - Construction of the covered building dock.

Nov. 1987 - Luxury liner *Crown Odyssey* is launched. For the first time this is not done from a slipway, but by the push of the button, which simply flooded the dock to float the new ship.

1990/91 - Covered building dock extended 328 ft. (100 m).

1993 - Largest car/passenger cruise ferry in the world, *Silja Europa*, is delivered.

May 1994 - Official approval of the plan to deepen the Ems River for vessels with a draft of 24 ft. (7.3 m).

BUYERS DIRECTORY

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.

ABRASIVES

Ervin Industries, Inc., 3893 Research Park Drive, Ann Arbor, MI 48106-1668
Myers, Metals, & Minerals, 801 Second Ave., Suite 1505, Seattle, WA 98104

ABSORBENTS

Haz Mat Response, 5841 Box Canyon Rd., La Jolla, CA 92037

ADHESIVES

Life Industries, Corp., 205 Sweet Hollow Rd., Old Bethpage, NY 11804

AIR CONDITIONING AND REFRIGERATION—Repair & Installation

Adrick Marine, 141D Central Ave., Farmingdale, NY 11735

Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001

Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21811

Carrier Transicold, P.O. Box 4805, Syracuse, NY 13221

Johnston Brothers, 180 Enterprises Avenue, Patterson, LA 70392

Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

ALARMS, FACTORY MUTUAL-APPROVED

Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226

ALUMINUM BOATS

Workskiff, Inc., 10824 Bothell Hwy S.E., Bothell, WA 98102-6869

ANTENNA/RATE OF TURN INDICATOR

Rivertronics 2624 East Broadway, Alton, IL 62002

ASBESTOS ABATEMENT

Chemplex Environmental Prod., Inc., 3405 Highway 33, Neptune, NJ 07753

AUCTION

National Auction Bulletin, Inc., 4419 West Tradewinds Ave., Fort Lauderdale, FL 33308-4464

AUTOMATION

Automation Products, Inc., 3030 Max Roy, Houston TX 77006

BALLAST

Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219

Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031

Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste. 203 Tucson, AZ 85714

BARGE BUILDING

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U.S.A. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363p., -0168

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Northstar Marine, 84 Wall Street, Farmingdale, NY 11735

BOW THRUSTER

W. Boterman, Holtenbroekerdijk 40, 8031 ER Zwolle, The Netherlands

Thrustmaster of Texas P.O. Box 840189 Houston, TX 77284-0189

BROKERS

151 Maritime Services, 34062 El Encanto/B, Dana Pt. CA 92629

Captain Astad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335

Emerald Yacht & Ship Brokers, 759 N. Milwaukee St., # 552, Milwaukee, WI 53202

Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422

Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BULKHEAD SEALS

Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY;

U.S.A. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

CABINETRY

Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

CABLE ASSEMBLIES

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

CABLE CLAMPS- STAINLESS STEEL

Band-It P.O. Box 16307 Denver, CO 16307

CABLE PROTECTION

AT & T Cable Protection, 340 Mt. Kemble Ave., Morristown, N.J. 07960

CABLE TRANSIT SYSTEMS

NMP Corp., P.O. Box 35493, Tulsa OK 74153-0493

CEILINGS, DECORATIVE METAL

The Gage Corp., 803 S. Black River St., Sparta, WI 54656

CELLULAR TELEPHONE SERVICE

Cellnet Corp., 400 Main St., Ste. 800, Stamford, CT 06901-3004

CHAINS

Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026

Washington Chain & Supply Inc., Box 3645, Seattle, WA 98124

Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

CHAIRS

Gasser Chair Co., 4136 Loganway, Youngstown, OH 44505

Shelby Williams Industries, Inc. 150 Shelby Williams Dr., Morristown, TN 37813

CHEMICALS

Drew Ameroid Marine, One Drew Plaza, Boonton, NJ 07005

Unitor Ship service Inc., 2375 West Esther Street, Long Beach, CA 90813

CLAMPING—Pipe, Tubes, Hose

Band-It P.O. Box 16307 Denver, CO 16307

ZSI, 12749 Richfield Ct., Livonia, MI 48150

CLASSIFICATION SOCIETY

American Bureau of Shipping, 2 World Trade Center, 106th Fl, New York, NY 10048

COATING WELDER

Bug-O-Systems 3003 W. Carson St., Pittsburgh, PA 15204

COAXIAL CABLES

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

COMPOUNDS

ITW Philadelphia Resins, 130 Commerce Dr, Montgomeryville, PA 18936

COMPUTER LOFTING

Barataria Lofting Co., Inc., 1616 Barataria Blvd., Ste. 4, Marrero, LA 70072

COMPUTERIZED INFORMATION SYSTEMS

All Alpha Int'l., Inc. P.O. Box 498985, Cincinnati, OH 45249

Autoship Systems Corp., #403, 611 Alexander St., Vancouver, BC, Canada V6A1E

Chand Corporation, 157 Hwy 654, Matthews, LA 700375

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

Intergraph Corporation, 2051 Mercator Drive, Reston, VA 22091-3413

Kockums Computer Systems AB, PO Box 50555, s-202 15 Malmo, SWEDEN

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

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

CONDENSERS/SEPARATORS

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

CONTROL SYSTEM—Monitoring

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY

Electronic Design Inc., 3020 20th St., Metairie, LA 70002

Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123

Kobell Mfg. Co. 11720 Horshoe Way, Richmond, BC, CANADA V7A 4V5

IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062

MMC International, 60 Inip Dr, Inwood NY 11696

Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135

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

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

Teleflex Naval Technologies, 205 Church Rd., North Wales, PA 19454

CONTROL SYSTEM—Steering

Engine monitor, Inc., 179 Hickory Avenue Harahan, LA 70123

KGW Schweriner, Wismarsche Strasse 380, 19055 Schwern, GERMANY

Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

CONVERSIONS & REPAIRS

Gulf Coast Fabrication, Inc., P.O. Box 539, Lakeshore, MS 39558

Vancouver Shipyards, 50 Pemberton Ave., N. Vancouver, B.C. CANADA V7P 2R2

CONVEYOR BELT REPAIR

Klehma Rubber Engineering, GERMANY

U.S. Rep: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

COUPLINGS

American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882

Holset Engineering, 1320 Kemper Meadow Drive, Cincinnati, OH 45240

Lo-Rez Vibration Control Ltd., 186 West 8th Avenue, Vancouver, BC

CANADA, V5Y1N2

Mapeco Products, 90 Forest Avenue, P.O. Box 382, Locust Valley, NY 11580

Ovako Steel Inc., 1447 New Litchfield St., Torrington, CT 06790

CRANE-HOIST-DERRICK-WHIRLIEYS

AmClyde, 240 E. Plato Blvd., Saint Paul, MN 551071609

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

Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072

Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA

Macgregor USA 20 Chapin Rd., Pine Brook, NJ 07058

Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

J. D. Neuhaus Hebezeugue GmbH, D-5810 Witten, GERMANY

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

CRANES

AmClyde, 240 E. Plato Blvd., Saint Paul, MN 551071609

Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801

Morgan Marine, 1300 Nomanly Place, Santa Ana, CA 92705

Pallinger Inc., 8040 Dorchester Rd., Niagara Falls, Ontario, CANADA L2E 6V6

Tech Crane Int'l., Inc., 61130 Timberbend Dr., Lacombe, LA 70445

CRANKSHAFT REPAIR

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

DECK CAULKING/REPAIR

Life Industries, Corp., 205 Sweet Hollow Rd., Old Bethpage, NY 11804

DECK MACHINERY — Cargo Handling Equipment

Hawboldt Ind., Hwv 3, P.O. Box 80, Chester, Nova Scotia, CANADA BOJ 1JO

Lakeshore Inc., PO Box 809, Iron Mountain, MI 49801

MacGregor-Navire Group, 34 Bedford Rd., Clapham North, London SW4 7HH

Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032

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

Willem Pot b.v., P. O. Box 29102, 3001 GC Rotterdam, The Netherlands

DECK MACHINERY

All Alpha Int'l., Inc. P.O. Box 498985, Cincinnati, OH 45249

AmClyde, 240 E. Plato Blvd., Saint Paul, MN 551071609

American Block Co. 6311 Breen Rd., Houston, TX 77086

Hawboldt Ind., Hwv 3, P.O. Box 80, Chester, Nova Scotia, CANADA BOJ 1JO

Lakeshore, Inc., PO Box 809, Iron Mountain, MI 49801

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454

NEI Clarke Chapman Canada, 1075 N. Service Rd. W., Unit 4, Oakville, Ontario, CANADA L6M 2G2

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

Pusnes, PO Box 102, N-4818, Faervik, NORWAY

Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032

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

Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

DECK STRUCTURES/ CONTROL CABS

Carolina Cockpit PO Box 83037, Portland, OR 97283

DESALINATION - REVERSE OSMOSIS

Rochem Separation Systems, Inc., 3904 Del Amo Blvd., Ste. 801, Torrance, CA 90503

Rochem Separation Systems, P.O. Box 156, 54 Rue Agasse, 1211 Geneve 17, SWITZERLAND

DIESEL ACCESSORIES

General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360

Hatch & Kirk Inc., 601 McFarland Rd., Houston, TX 77011

Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101

DIESEL ENGINE — Spare Parts & Repair

ABB Industry Oy, 100 Madison Corp. Park Rte.6, Brewster, NY 10509

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

Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610

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 61265

Diesel Engine & Parts Co., 8123 Hillsboro Ave., Houston, TX 77029

Giro Engineering Ltd, Talisman, Duncan Road, Park Gate, South Hampton, S03

7BX ENGLAND

Gottens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231

Hatch & Kirk Inc., 601 McFarland Rd., Houston, TX 77011

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

MAN B&W Diesel AG, Stadtbachstrasse 1, D-86153 Augsburg 1, GERMANY

MAN B&W Diesel A/S, Tegholmsgade 41, DK-2450 Copenhagen SV, DENMARK

MAN B&W Diesel, 17 State St., New York, NY 10004

MTU of North America, 10450 Corporate Dr., Houston, TX 77478

Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY

Motor-Service AB, Box 2115, S-144 04 Ronninge, SWEDEN

Motor-Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315

New Sulzer Diesel US Inc., 525 Washington Blvd., Ste. 2408, Jersey City, NJ 07310

Ocean Power 571 Central avenue, New Providence, NJ 07974

Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW, ENGLAND

Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084

Ulstein Bergen AS, PO Box 924, N5002 Bergen, NORWAY

Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401

DIVING & SALVAGE

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

H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183

Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOORS - MARINE & INDUSTRIAL

Insulations, Inc., 1101 Edwards Ave. Harahan, LA 70123

Mapeco Walz & Krenzer, Inc., 90 Forest Ave., Locust Valley, NY 11560

Maritime Services Corp., 3457 Guignard Drive, Hood River OR 97031

DRILLING & BLASTING

Marine Drilling & Blasting, PO Box 10455, Jacksonville, FL 32247-0455

DRY DOCKS-Design

Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381

North Florida Shipyards,

Walz & Krenzer, Inc., 90 Forest Ave. Locust Valley N.Y. 11560
KEEL COOLERS
R.W. Fernstrom & Co., 1716 Eleventh Ave. Menominee, MI 49858
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307
LIFEBOATS/RAFTS
American Eagle Mfg., Inc., 780 Pearie Jensen Way, LaConner, WA 98257
Caley Ocean Systems, Mayor Avenue, East Kilbride, Scotland, G74 4PU
Dunlop-Beaufort Ltd., 12351 Bridgeport Rd., Richmond, B.C., CANADA V6V-1J4
Fr. Fassmer GmbH & Co., D-2876 Berne 2, Wese, GERMANY
Norsale AS, P.O. Box 115, N-4818 Faervik, Norway
Ocean Power 571 Central Avenue, New Providence, NJ 07974
Revere Survival Products, 603-607 West 29th St., New York, NY 10001
Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America, P.O. Box 400, Stevensville, MD 21666
LIFESAVING EQUIPMENT
Dunlop-Beaufort Ltd., 12351 Bridgeport Rd., Richmond, B.C., CANADA V6V-1J4
Stearns Manufacturing, P.O. Box 1498, St. Cloud, MN 56302
Unitor Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813
LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale, FL 33310-5247
All Alpha Int'l., Inc., P.O. Box 498985, Cincinnati, OH 45249
Glamox, 44 Austin Street, P.O. Box 13522, St. John's, NF CANADA A1B 4B8
Gollen Marine, 160 Van Brunt St., Brooklyn, NY 11231
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Julian A. McDermott, 1639 Stephen St., Ridgewood, NY 11385
Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
Francis Searchlights/Stam Supply Co., 4415 6th N.W., Seattle, WA 98107
LIQUID LEVEL GAUGES
Eugene Ernst Products Co., 116 Main St., Farmingdale, N.J. 07727
LIQUID LEVEL INDICATORS
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226
LIQUID OVERFILL PROTECTION SYSTEMS
E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026
Metritape, Inc., 59 Porter Rd., Littleton, MA 01460
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226
LOGISTICS
Newport News Shipbuilding, Logistics & Technical Services, 12129 Jefferson Ave., Newport News, VA 23603
QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455
VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs, MS 39564
LOW-SMOKE CABLES
Times Microwave Systems, P.O. Box 5039, Wallingford, CT 06492
LUBRICANTS
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650
MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavio, 619 Industrial Rd., Carlstadt, NJ 07072
Gollen Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
MACHINERY MONITOR AND CONTROL SYSTEMS
Electronic Marine Systems, 800 Ferndale Pl., Mahwah, NJ 07065
MARINE ACCESSORIES
Sen-Dure Products, Inc., 6785 N.W. 17th Avenue, Ft. Lauderdale, FL 33309
MARINE ACCOMMODATIONS
Directions in Design Inc., 633 Emerson, Suite 100, St. Louis, MO 63141
Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave, Boca Raton, FL 33431
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031
MARINE CEILINGS
The Gage Corp., 803 S. Black River St., Sparta, WI 54656
Hydro-Aluminium, Vik Verk, N-5880 VIK I SOGN, Norway
MARINE COATINGS
Devoe Coatings, 4000 Dupont Circle, Louisville, KY 40207
MARINE DECKING
Selby, P.O. Box 1600, Sapulpa, OK 74067
MARINE ELECTRONICS
Frank L. Beier Radio, 2001 Ridgelaque Drive, Metairie, LA 70001
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Saab Marine Electronics AB, Box 13045, 402 51 Goteborg, SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
MARINE ELEVATORS
Alimak Elevator Co., 1100 Boston Ave., Bridgeport, CT 06601
MARINE FENDERS
Viking Fender Co., 340 Lehigh Ave., Perth Amboy, NJ 08861
MARINE FINANCING
Safeco Credit Co. Inc., 4909 156th Ave. NE, Redmond, WA 98052
MARINE FIRE PROTECTION
Hiller Systems, 3710 Lakeside Court, Mobile, AL 36693
Unitor Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813
MARINE FURNITURE
Directions In Design, 633 Emerson, Ste. 100, St. Louis MO 63141
Engineered Data Products, P.O. Box 565, Woodbury, NJ 08906-7565
Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave. Boca Raton, FL 33431
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031
MARINE GEARS
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492
MARINE INSURANCE
John G. Alden, 1300 SE 17th St., Fort Lauderdale, FL 33316
MARINE INSPECTION
Ultrasonic & Magnetics Corp., PO Box 8787, New Orleans, LA 70182
MARINE INTERIORS
Jamestown Metal Marine Sales, 4710 Northwest Second Ave, Boca Raton, FL 33431
Johnson Construction Specialties, Inc., 3420 Rusk P.O. Box 1360 Houston Texas 77251
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
MARINE LUBRICANTS
Royal Lubricants Co. 6 campus Drive, Parsippany, NJ 07054
MARINE PLUMBING
Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21811
MARINE PUMPS
Gilkes Inc., P.O. Box 628, Seabrook, TX 77586
MARINE SHIP MANAGEMENT
BarbaArkhn, 1810 Chapel Ave. West, Cherry Hill, NJ 08002
MARINE SURPLUS SALES
Defense Reutilization & Marketing Service, 2163 Airways Blvd., Memphis, TN 38114
MONITOR CONTROL ALARM
Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123
Tracor Marcon, 800 Ferndale Pl., Rahway, NJ 07065
MULTI-CABLE PENETRATION DEVICE
NMP, 12437 E. 60th St., Tulsa, OK 74153
NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
CDI Marine Co., 4040 Woodcock Dr., Suite 200, Jacksonville, FL 32207
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Ln., Dedham, MA 02026
Crane Consultants, 15301 First Ave S., Seattle WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
Arthur D. Darden, 3200 Ridgelaque Dr., Suite 403, Metairie LA 70002
DeJong & Lebet, Inc., 1734 Emerson Street, Jacksonville, FL 32207
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, 2120 Washington Blvd. Ste.200, Arlington, VA 22204
Diversified Technologies, 812 Live Oak Dr., Chesapeake VA 23320
Elliot Bay Design Group 5301 Shishole Ave. N.W. Ste. 200, Seattle, WA 98107
Encon Mgmt. & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
GHM Inc. (Ind. Measurement Consultants), P.O. Box 1836, Newport News, VA 23601
Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010
John W. Gilbert & Assoc., Inc., 66 Long Wharf, Boston, MA 02110
The Glosien Assoc. Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Guido Perla & Assoc., 4039 21st Ave., Ste. 300, Seattle, WA 98199
Morris Guralnick Associates, Inc., 130 Sutter St., Ste. 400, San Francisco, CA 94104
C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
Hydrocomp, Inc., 202 C Packets Court, Williamsburg, VA 23185
JH Inc., No. 4 Executive Campus, Culbert Blvd. & Route 70, P.O. Box 5031, Cherry Hill, NJ 08034
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
James S. Krogen, 799 Brickell Plaza Ste. 701, Miami, FL 33131
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626

Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Ctr. Ste 3000, N.Y., NY 10048
Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401
Marine Design & Operations, Inc., 226 Chestnut St., Roselle Park, NJ 07204
Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902
Marine Power Associates, 1010 Turquoise St., Ste 217, San Diego, CA 92109
Maritech, Seacraft, Bay Road, Newmarket, NH 03857
Maritime Design, Inc., 3020 Hartley Rd., Jacksonville, FL 32257
R.J. Mellusi & Co., 71 Hudson St., New York, NY 10013
Nautical Designs, Inc., 2101 S. Andrews Ave., Suite 202, Ft. Lauderdale FL 33316
Ocean Motions Co., P.O. Box 130, 49 Shore Drive, Barrington, RI 02806-0130
Olsen Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777
QED Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Folsom St., Ste. 301, San Francisco, CA 94107
Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
Sea School, 10812 Gandy Boulevard, St. Petersburg, FL 33702
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 975, Barnegat Light, NJ 08006; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041;
50 Vashell Way, Orinda, CA 94563
George G. Sharp, Inc., 100 Church St., New York, NY 10007
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
A.K. Suda & Ass., 3004 19th St., Metairie, LA 70002-4989
TIMSCO, P. O. Box 91360, Mobile AL 36691
NAVIGATION & COMMUNICATIONS EQUIPMENT
Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
Cinnet Corp, 400 Main St, Stamford, CT 06901-3004
ComNav Marine Ltd., 1420 Frances St., Vancouver, BC, CANADA V5L 1Y9
Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024
Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Hose-McCann, 1241 W. Newport Center Dr., Deerfield Beach, FL 33442
ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Essex, UK
Mackay Communications, 300 Columbus Circle, Edison, NJ 08837
Matrix Technologies, Inc., 342 Pennywell Rd., St. Johns, N.F., CANADA A1C 5J2
Megapulse, Inc., 8 Preston Court, Bedford MA 01730-2380
Negron Marine Consultants, 840 Bond Street, Elizabeth, NJ 07201
Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY
Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
RD Instruments, 9855 Businesspark Ave., San Diego, CA 92131
Raytheon Marine Co, 678 Island Pond Rd, Manchester, NH 03109-5420
Scandinavian Micro Systems P.O. Box 155, N-1411, Kolbotn, NORWAY
Scientific Atlanta, 4291 Communications Dr., Norcross, GA 30093
Sea, Inc., 7030 220th S.W., Mountlake Terrace, WA 98043
SGC, Inc. P. O. Box 3526 Bellevue, WA 98009
Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036
Simrad Robertson, 10810 Hamerly, Suite 100, Houston, TX 77043-1923
Sound Propeller, 1608 Fairview Ave., Seattle, WA 98102
SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116
Sperry Marine Inc., 1070 Seminole Trail, Charlottesville VA 22901
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Summer Equipment Ltd., 24 West 4th Ave., Vancouver V5Y 1G3, CANADA
Trimble Navigation, 585 North West Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130
OIL COOLERS
Sen-Dure Products, Inc., 6785 N.W. 17th Avenue, Ft. Lauderdale, FL 33309
OIL—Marine—Additives
Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650
OIL SPILL CONTAINMENT
Foss Environmental, 7440 W. Marginal Way S., Seattle, WA 98108-4141
OIL SPILL RESPONSE MANAGEMENT SERVICES
Geo Source 4100 I Shell Square, New Orleans, LA 70139
OIL/WATER SEPARATORS
Alfa-Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974-0556
Blohm & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY;
U.S. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
MMC International, 60 Inip Dr., Inwood NY 11696
National Fluid Separators, 827 Hanley Industrial Ct., St. Louis, MO 63144
Nelson Industries, Highway 51 West, Stoughton, WI 53589
Ocean Power 571 Central Avenue, New Providence, NJ 07974
PAINT—COATING—CORROSION CONTROL
Advanced Polymer Sciences, PO Box 269, Avon, OH 44011
Corrodeal, Inc., 1045 12th Ave. NW-F5A, Issaquah, WA 98027
Devoe Coatings 4000 Dupont Circle, Louisville, KY 40207
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502
Jamestown Distrib., 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Hempel Coatings, Foot of Currie Avenue, Wallington, NJ 07057
Microphor, Inc., Marine Div., 452 E. Hill Rd., P.O. Box 1460, Willis, CA 95490
Product Research Service, Inc., 229 Hwy 23, PO Box 159, Belle Chasse, LA 70037
Royal Chemical, 2705 Concord Road, Belle Chasse, LA 70037
Sigma Coatings, 8979 Market St., Houston, TX 77029, 330 Rover Rd., Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030
Unitor Ship Services Inc., 2375 West Esther Street, Long Beach, CA 90813
PAINT REMOVAL
White Metals, Inc., 6300 Midvale, Houston, TX 77087
PIPE FITTINGS/CONNECTING SYSTEMS
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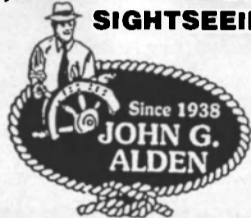
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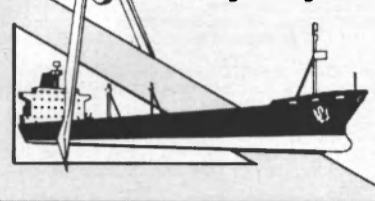
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


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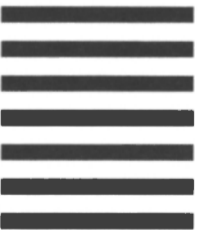
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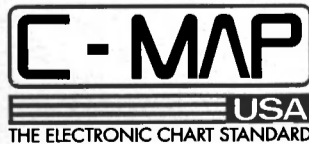
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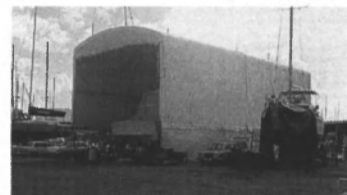
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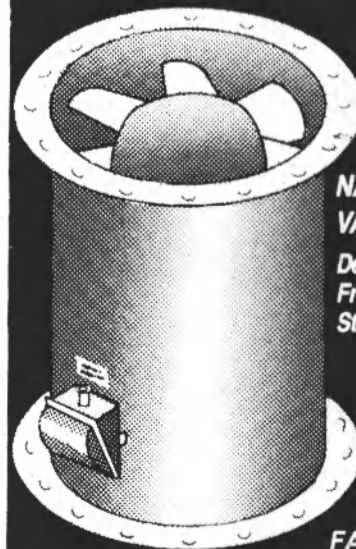
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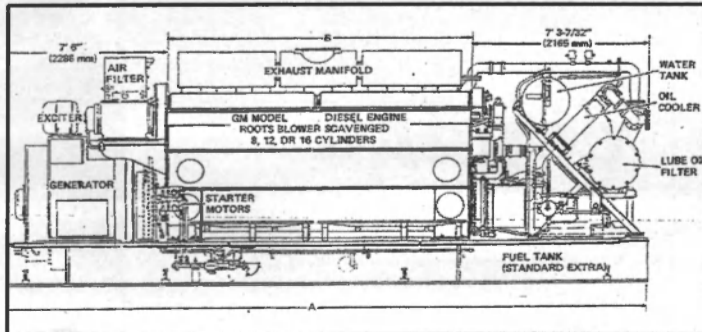
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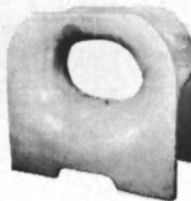


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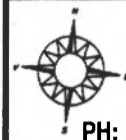
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Raytheon Wins \$44.6 Million Contract For Aegis Equipment

The Naval Sea Systems Command has awarded Raytheon Company's Electronic Systems Division a \$44.6 million contract for the fiscal year 1995 requirement of three AN/SPY-1D transmitters including MK99 fire control system ancillary equipment for the three DDG-51 Arleigh Burke class destroyers.

For more information on Raytheon
 Circle 115 on Reader Service Card

Cray Research Systems Wins DOD Modernization Program Contract

Cray Research announced that a Cray C916 supercomputer system was selected for a Department of Defense Modernization Program installation at the Naval Oceanographic Office, Stennis Space Center, Bay St. Louis, Miss. The system was ordered by Northrop Grumman Data Systems and Services Division, prime contractor for this DOD site. The contract value of the accepted Cray system and related Cray equipment exceeds \$45 million. This is the second installation of a Cray C916 supercomputer at a Department of Defense Major Shared Resource Center (MSRC), Cray said. In 1993, Cray Research installed a Cray C916 system at the first MSRC at the U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. Both facilities are part of the Department of Defense High Performance Computing Modernization

Program. According to DOD officials, high performance computing centers and communications are essential base technologies that will drive or limit the conduct of virtually all science and engineering in the future. The Naval Oceanographic Office's new 16-processor Cray C916 system will be linked via high-speed communications networks to serve Army, Navy, Air Force, and other defense agency researchers throughout the U.S.

Vitro Wins \$15.8 M Navy Contract

Vitro Corporation, a subsidiary of Tracor, Inc., received a four-year, \$15.8 million contract with the Naval Undersea Warfare Center (NUWC) Detachment, New London, Conn., to provide engineering services. Vitro will provide test and evaluation/quality assurance engineering services for the AN/SQQ-89(V) Surface Anti-submarine Warfare Combat system and subsystem software, hardware, and firmware. "Vitro's success in winning this key, follow-on work was accomplished in an extremely competitive, cost-driven environment," said **Robert Barber**, senior vice president. Vitro has been providing engineering services to NUWC for 17 years and work will be performed by personnel in Vitro's Groton, Conn., location. Vitro is a diversified systems and software engineering company headquartered in Rockville, Md. The company provides engineering services for major weapons, space, and intelligence programs.

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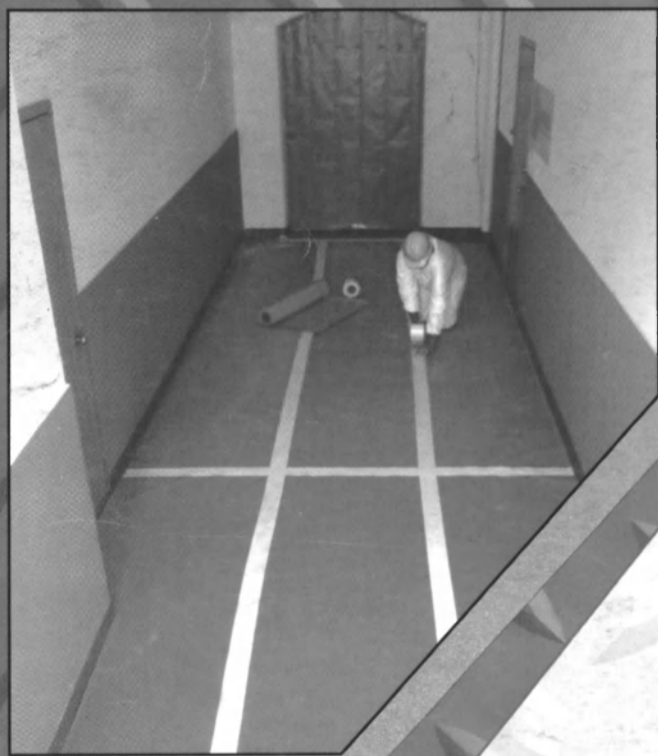
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