

MARITIME REPORTER AND ENGINEERING NEWS

OUTSTANDING OCEANGOING SHIPS OF '93



**Kvaerner Govan
Profits With New Work,
Production Systems**

DEFENSE CONVERSION UPDATE

**Clinton Announces First
TRP Fund Recipients**

**A Five-Year Projection
For U.S. Shipbuilding**

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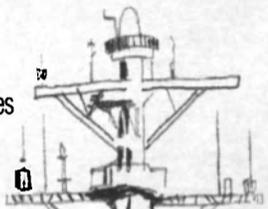
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ON THE COVER

The Sensation and Fascination, two of five ships being built at Kvaerner's Helsinki New Shipyard for Caribbean Cruise Lines. The Sensation was delivered on Oct. 18 (story, p. 28).

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Ingalls Wins \$33.9 Million Navy Contract For Aegis Program

The U.S. Navy has awarded Ingalls Shipbuilding Division of Litton, Pascagoula, Miss., an additional \$33.9 million contract for continuing engineering and support services for the Navy's Ticonderoga (CG 47) Class Aegis guided missile cruiser program.

This brings the total amount awarded to Ingalls for the program since 1981 to \$292 million.

MARITIME REPORTER and Engineering News

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**MARITIME
REPORTER**
AND
ENGINEERING NEWS

ISSN-0025-3448

No. 12

Volume 55

118 EAST 25th STREET
NEW YORK, N.Y. 10010
(212) 477-6700

ESTABLISHED 1939

Maritime Reporter/Engineering News is published monthly by Maritime Activity Reports, Inc. Mailed at Second Class Postage Rates at Waterbury, CT 06701 and additional mailing offices.

Postmaster send notification (Form 3579) regarding undeliverable magazines to Maritime Reporter/Engineering News, 118 East 25th Street, New York, NY 10010.

Publishers are not responsible for the safekeeping or return of editorial material.

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Defense Authorization Bill To Strengthen U.S. Industry

Based on the language of the FY 1994 Defense Authorization Conference Report, the reality of a stronger U.S. shipbuilding base took another step forward. Established by the bill, under SEC. 1352, is the National Shipbuilding Initiative, which is "to be carried out to support the

industrial base for national security objectives by assisting in the reestablishment of the United States shipbuilding industry as a self-sufficient, internationally competitive industry." Laid out in this initiative are financial incentive programs to provide loan guarantees to initiate

commercial ship construction for domestic and export sale and to encourage shipyard modernization.

For additional details on the U.S. market, including a five-year newbuilding projection as well as the latest legislative news, turn to page 30.

NSRP Symposium Tackles Technical Topics

The National Shipbuilding Research Program's (NSRP) recent Ship Production Symposium, held in early November in Williamsburg, Va., featured the presentation of 25 papers examining a variety of topics of interest to a wide sector of the shipbuilding community. Sponsored by the Hampton Roads Section of the Society of Naval Architects and Marine Engineers (SNAME), the three-day technical symposium addressed everything from integrated ship design, to Naval ship affordability through modularity, to a comparative study of computer aided manufacturing in small shipyards.

Jonathan M. Ross of Ross-McNatt Architects gave his presentation on "Integrated Ship Design and Its Role in Enhancing Ship Production." The presentation was a comprehensive look at the abilities of eight integrated ship design programs, including: HULLTECH, AutoSHIP System, FORAN, HICADEC, IMSA, TRIBON, NAPA and NAVSEA CAD-2. Mr. Ross concluded that trends in the field include further integration through product models, enhanced communication with third-party programs, increased user friendly interfaces and extension of program capabilities into early stages of design and into production.

The conclusion of a study of computer aided manufacturing in small shipyards in the U.S. and the U.K. was that these yards face a difficult task in effectively employing computers, based mainly on a shortage of capital for computer hardware and software (for more details, see related story page 59).

Aside from the conference, festivities included a keynote luncheon address by U.S. Coast Guard Commandant Adm. **J. William Kime**, who also presented the Kennedy Award, the Elmer L. Hann Award, and the Technical and Research Award.

American Pacific, Unitor In Distribution Discussions

At press time, rumors regarding a partnership in which Unitor AS of Norway would distribute American Pacific's Halotron fire suppression products in Unitor's markets, were just that: rumors. The fact is, the two companies are currently discussing such an arrangement, according to American Pacific Corp. (Las Vegas), and American Pacific is optimistic that the current discussions will be successfully concluded soon. For more information on the products and services of American Pacific,

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For more information on Unitor,

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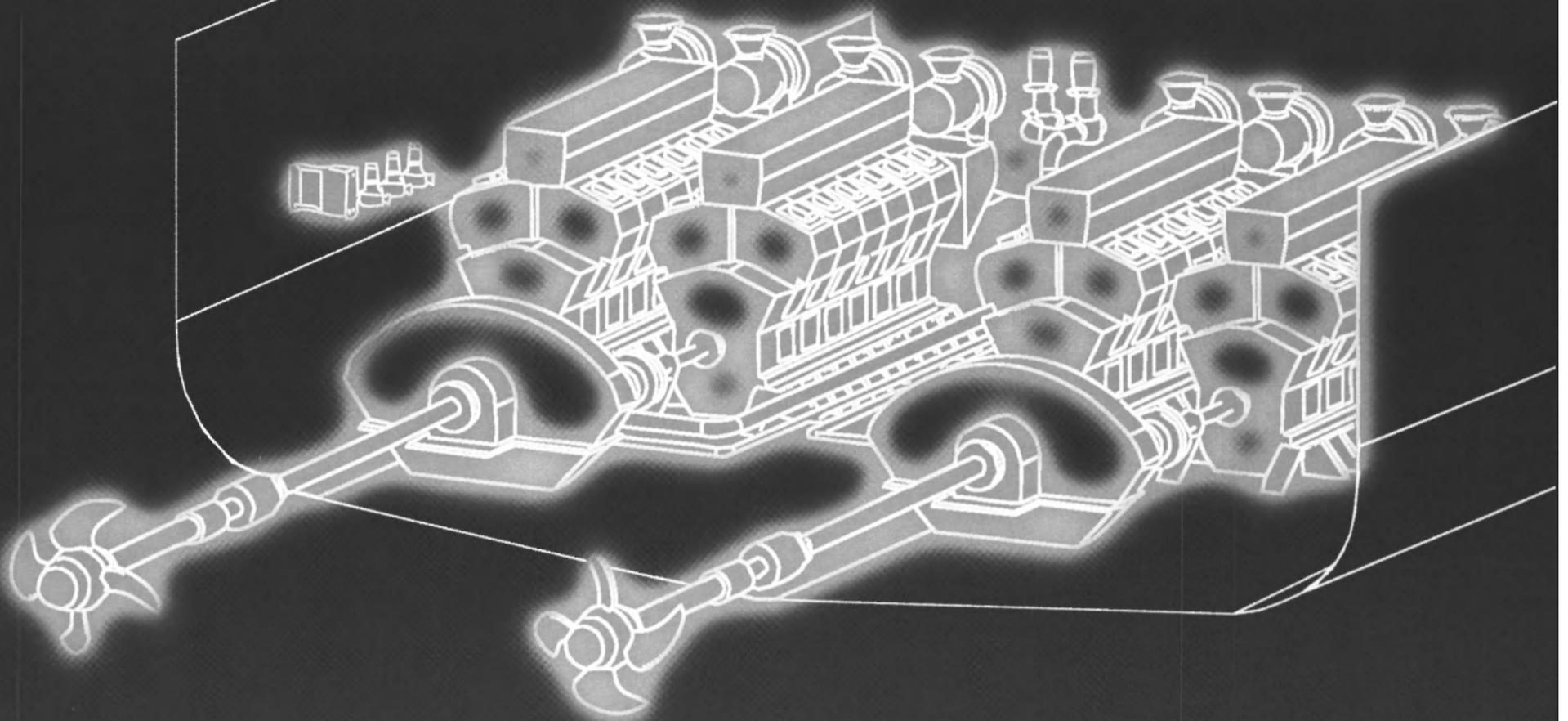


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NMMA Predicts NAFTA Will Generate \$75 Million

Primed from its recent Congressional success on repeal of the excise tax on boats, the National Marine Manufacturers Association (NMMA) mobilized a grassroots campaign across the country to back White House efforts to win affirmative votes on NAFTA. "Our industry stands to gain over \$75 million in annual sales over the next five

years with NAFTA's elimination of the 20 percent Mexican tariff on boats," said **Jeff W. Napier**, president of the NMMA. "That means an additional 5,000 production jobs in this country."

Marine manufacturers have relied on foreign markets during the recession to sustain jobs and businesses. According to a recent survey of NMMA members who account for 95 percent of boat production, 75 percent are active exporters with some selling as much as 25 to

50 percent of their production outside the U.S.

Reliance Electric Names Peterson Builders' Anti-Mine Vessel "Ship Of The Year"

Reliance Electric Company has named the mine countermeasure (MCM) vessel MCM-11 Gladiator built by Peterson Builders, Inc. (PBI)

of Sturgeon Bay, Wis., ship of the year. The presentation was made to **Ellsworth L. Peterson**, president of PBI, during the SNAME Annual Meeting and Maritime Exposition in New York City.

PBI has delivered nine Avenger Class MCM vessels and will soon deliver the Chief (MCM-14), the final vessel in the class. These vessels have hulls and superstructures made of wood, and PBI is one of only a few shipyards in the world capable of constructing wood-hulled vessels this large. For more information on Peterson Builders,

Circle 113 on Reader Service Card

House Approves Bill To Penalize Subsidized Foreign-Built, Repaired Vessels

The House Ways and Means Trade Subcommittee approved Nov. 9 by voice vote a bill to impose financial penalties on vessels built or repaired in subsidized foreign shipyards. The bill's goal is to aid U.S. shipbuilders, who contend that subsidies have unfairly enabled foreign yards to dominate the commercial shipbuilding market. At least 20 foreign countries subsidize their shipyards, a recent federal study found. The penalties in the bill (HR 1402) range from denying vessels entry into U.S. ports to imposing a fee between \$500,000 and \$1 million per voyage. Subsidizing countries would have six months to negotiate an agreement phasing out their subsidies before the first penalties were imposed.

Before the bill was approved, Chairman **Sam Gibbons** (D-Fla.) offered a substitute amendment that removed one of the bill's most controversial sections. That section would have imposed heavy duties on companies that buy or lease ships built in foreign-subsidized yards or that have ships repaired there.

The bill's underlying purpose is to give the U.S. more leverage in the international negotiations to end shipbuilding subsidies. U.S. officials have been seeking such an agreement for several years, but their clout is limited — the U.S. unilaterally ended its shipbuilding subsidies in 1981.

Texaco Unit Names New President

With the completion of the reorganization and relocation to Los Angeles of Texaco Refining and Marketing Inc. (TRMI), **Donald H. Schmude**, a vice president of Texaco Inc. and president of TRMI, will relinquish his position with TRMI and relocate from Los Angeles to Anacortes, Wash. to work on several special corporate projects. The change is effective December 1.

Thomas M. Matthews has been elected a vice president of Texaco, Inc. and the new president of TRMI. In his new position, Mr. **Matthews**

(Continued on page 10)

Maritime Reporter/Engineering News



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(Continued from page 8)

will oversee all of Texaco's domestic operations and interests in petroleum refining, marketing and associated product activities, including lubricants, business services and credit card marketing.

He also will continue to represent Texaco on the management committee of Star Enterprise, Texaco's joint venture with Saudi Refining Inc. Mr. **Matthews** is currently vice president of Texaco U.S.A.'s Gas Department, based in Houston.

Sembawang Wins Conversion Contract

Sembawang Maritime Ltd. won a contract to convert a bulk carrier to a pipe-laying vessel for the Swiss Allseas Group. The bulk carrier is expected to be operational by the spring of 1995. When converted, the vessel will be able to lay pipelines of up to 60 inches in diameter in virtually unlimited water depth, Sembawang said in a statement.

Sperry Marine Under New Ownership

Sperry Marine Inc., a developer and manufacturer of marine electronic equipment headquartered in Charlottesville, Va., was acquired by a partnership formed by J. F. Lehman & Company in N.Y., together with institutional investors.

The partnership has appointed Dr. **John F. Lehman** as chairman of the board; **George A. Sawyer** as

president and chief executive officer; **John V. DeMaso** as executive vice president for operations; **Joseph A. Stroud** as executive vice president and chief financial officer; **Benjamin Bingham** as vice president for strategic development; and **N.E. "Pete" Bickers** as vice president, domestic and international finance. Commenting on the acquisition of Sperry Marine by the J.F. Lehman & Company partnership, Mr. **DeMaso** stated, "We fully expect that Sperry Marine will be a strong and well-managed company better positioned to serve its current U.S. and foreign customers and to expand into new markets. The future of the company couldn't be more promising."

Raytheon Announces Sales Position Appointments

Raytheon has appointed **Michael C. Demos** North American sales manager, and **J. Lyle St. Romain** regional sales manager for New England, replacing Mr. **Demos** in that position, in a strategic move designed to increase service to distribution and customer bases. Mr. **Demos** joined Raytheon Marine Company in 1985. He will provide strategic direction to six regional sales managers. Mr. **St. Romain** was promoted from the position of special programs manager in Hudson, N.H.

Carrier, BWS Marine Win NASSCO Orders

Carrier Transicold Marine Systems Group was awarded a \$3 million order for marine HVAC equipment from National Steel and Shipbuilding Co. (NASSCO) of San Diego, to go aboard three ships converted by NASSCO from containerships to Ro/Ro Strategic Sealift Ships for the Military Sealift Command. NASSCO also awarded BWS Marine, Inc., a division of Blume Worldwide Services, a contract to supply three shipsets of Delta Marine incinerators for the Sealift program.

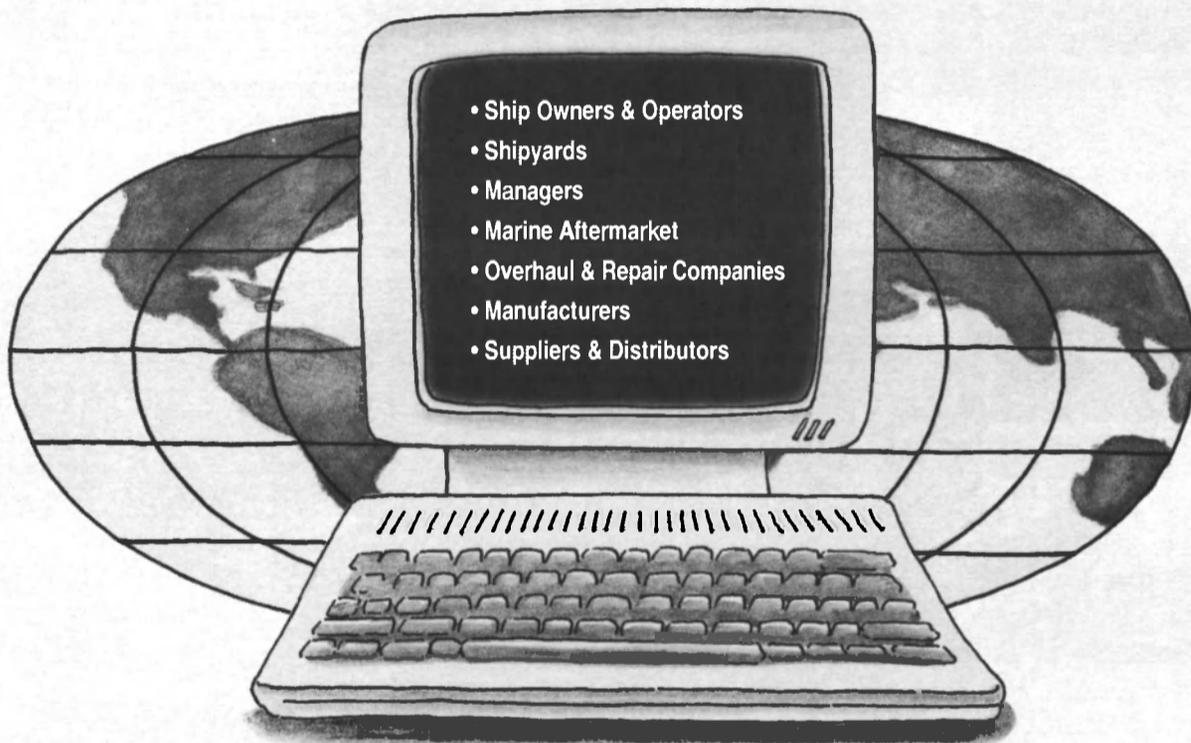
Carrier will supply 1,125 tons of air conditioning for cooling the cargo holds and 405 tons for the deck house, along with marinized 39 series air handlers and ships stores refrigeration plants. These specialized commercial marine packages will include the first marinized R-134a centrifugal chillers installed aboard converted ships in U.S. shipyards. The Delta Marine incinerators BWS Marine will supply are world leaders in enabling ships to meet Marpol requirements. BWS and Detegasa of Ferrol, Spain have reached an agreement to provide for U.S. manufacturing under license in compliance with the contract's "Buy American" provision. For more information on Carrier,

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For more information on BWS,

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The Global Marine Parts Department...



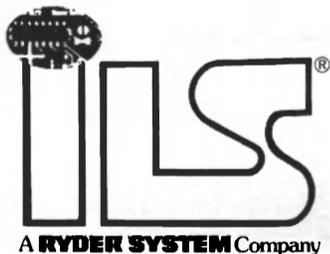
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DLI Engineering Wins \$7.6 Million Navy Contract

DLI Engineering Corporation of Bainbridge Island, Wa. won the first phase of a contract to support Machinery Condition Analysis (MCA), a machine maintenance computer program, aboard each of the Navy's aircraft carriers. The cost plus fixed fee contract's options, if exercised, cover five years and approximately \$7.6 million.

MCA is used by shipboard engineers to identify repair needs for approximately 400 machines per ship. DLI Engineering provides technical support and training to enhance the use of the MCA programs. For more information on DLI,

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Racal-Decca Wins \$959,000 Integrated Bridge Contract For LNG Carriers

Racal-Decca Marine won a contract for approximately \$959,000 to supply and install MIRANS 4000A integrated bridge systems for five Liquefied Natural Gas (LNG) carriers under construction for Petronas Tankers of Malaysia. Each system consists of two BridgeMaster 340 ARPA radars interswitched to X-band and S-band antennas. The MIRANS 4000A system includes MapMaster electronic mapping with chart table, a Live Situation Report console for detailed display of ship operational status, and an Mk 90 GPS stand-alone receiver.

In other Racal-Decca news, the Royal National Lifeboat Institution (RNLI) will install Racal-Decca BridgeMaster 180 color radars aboard all new Severn and Trent Class lifeboats. Deliveries have already begun, and the total order is expected to reach 110 radar systems. Over 2,500 BridgeMaster systems have been sold worldwide since the range was launched two years ago. For more information on Racal-Decca's radar systems,

Circle 116 on Reader Service Card

Hyundai Wins \$6.6 Million Portland Crane Contract

The Port of Portland Commission awarded a contract to Hyundai Corporation and Hyundai Heavy Industries Co., Ltd., Korea, for approximately \$6.6 million for purchase of a 50-long-ton container crane with a 100-foot gauge for use at the port's Terminal 6 container facility.

Hyundai's proposal includes a partnering agreement with the American design firm PACECO, which has more than three decades of crane design and manufacturing experience. The crane is part of an estimated \$15.1 million project to provide a larger, 100-foot gauge crane at Terminal 6 and upgrade work on the container dock and crane rails. The third generation

December, 1993

crane will accommodate more room on the dock for the trucks that feed the cranes. It has a long boom to reach containers stacked 16-wide on future post-Panamax ships.

In 1992 the Port of Portland reportedly had a 24 percent increase in container volume over the previous year. Port container growth stands at 9.1 percent for the first nine months of 1993. For more information on Hyundai,

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New South Korea Inmarsat-A Station To Service IOR

A new Inmarsat land earth station has been opened in Kumsan, South Korea, to serve the Indian Ocean Region (IOR). Operated by Korea Telecom, it is the 41st to provide access to Inmarsat's global mobile satellite communications network and it complements a similar service being offered from Kumsan for the Pacific Ocean Re-

gion (POR). Kumsan is initially providing Inmarsat-A services for users on land and sea, including automatic dialing, international operator, technical assistance, person to person and collect calls, advice on call duration, telex and line testing and commissioning. In the near future it will also begin offering a range of Inmarsat-C services. Inmarsat-C allows global store-and-forward data and text messaging communications using small terminals.



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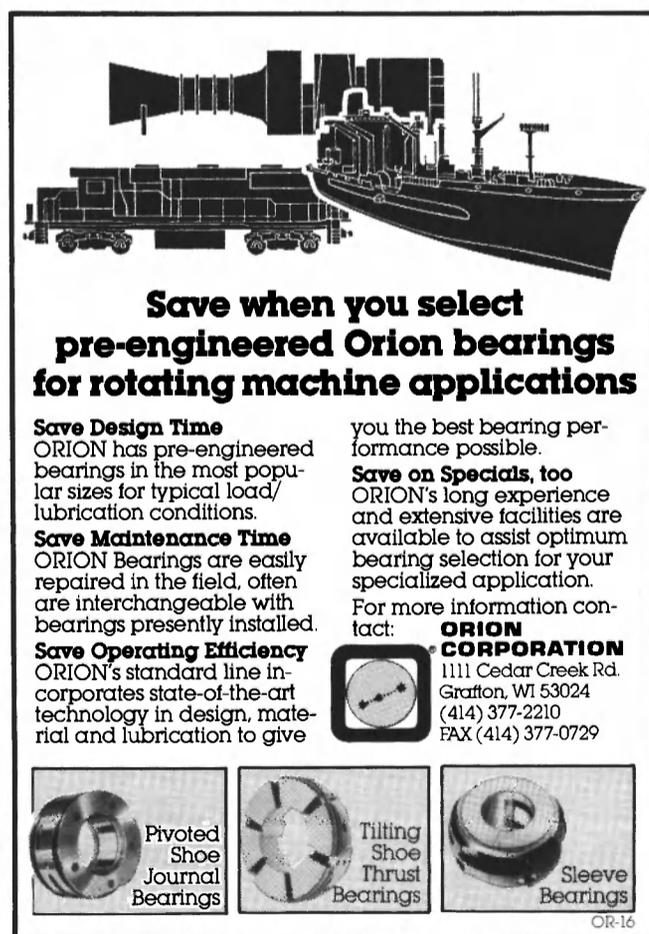
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Roberts Appointed Sales Manager Of Twin Disc's New Gulf Coast Office

Gary Roberts has been appointed regional sales manager, Gulf Coast area, for Twin Disc, Inc. The newly-established Twin Disc office in Harvey, La., will handle marine transmission sales and applications in commercial, military and pleasure boat markets in the Gulf Coast

and Inland Waterways systems. Twin Disc's new facility is located at 1556 Destrehan Avenue, Harvey, La., 70058. Tel: (504) 348-4666; fax: (504) 348-2200.

Bollinger Completes Vessel Conversions For NRC

Bollinger Machine Shop & Shipyard, Inc. Lockport Repair Division, recently completed a major conver-

sion project for the National Response Corporation (NRC) of Houston, Texas. The project began on June 14th and was completed August 16th, enabling NRC to have all nine vessels within their assigned ports by August 18th, as required by OPA 90. The work consisted of converting five 110-foot utility vessels and four 198-foot oil barges into oil recovery vessels. The conversion included installing hydraulic power packs, oil skimming gear, deck cranes, boom storage reels, ballast

tank conversion to recovered oil transfer tanks, fire monitors, controls to operate the various skimming gear, navigational light upgrade, A-60 insulation and alarm panels for monitoring the new gear.

For more information on the capabilities of Bollinger,

Circle 118 on Reader Service Card

Kvaerner Wins \$40 Million Ferry Order

Kvaerner Industrier AS has won a \$40 million order for two high-speed Foil Cat passenger ferries from Far East Hydrofoils Co. Ltd. of Hong Kong. Reportedly the Kvaerner yards in Norway and Singapore have won orders for 16 aluminum-hulled catamarans over the past 16 months.

Tidewater Launches Barge For Norfolk Dredging

Tidewater Equipment Corporation of Chesapeake, Va., a wholly owned subsidiary of Tidewater Construction Corp., recently launched the first of two 4,000 cubic yard-capacity, split hull hopper barges for Norfolk Dredging Company, also of Chesapeake. The vessels, which measure 250 feet long, 54 feet wide and 21 feet deep, will be used to support East Coast dredging operations. Marine Technology, Inc. provided the barge design and Rexroth the hydraulic system. Four Remco Hydraulic, Inc. 500-ton cylinders are used to open the barge for cargo dumping. A keel-cooled Detroit Diesel powers the 5,000-psi hydraulic system, which is remote controlled from the attendant tugboat. For more information on Tidewater Equipment Corp.,

Circle 122 on Reader Service Card

Gladding-Hearn Wins NYC Patrol Launch Contract

New York City's Harbor Unit has ordered a new patrol launch from Gladding-Hearn Shipbuilding, The Duclos Corp. Delivery is scheduled for April of 1994. The 55-foot, all-aluminum boat will be used as a station vessel, providing a large, stable platform and accommodations for 12-hour harbor patrols. The twin-screw vessel measures 15 feet abeam, draws four feet and is designed for rough-water operations. It is powered by Detroit Diesel 12V-71TA engines, each rated for 800 hp at 2,100 rpm, with a top speed of 30 knots. The engines drive two 34-inch nickel-bronze propellers via Twin Disc 2:1 reverse/reduction gears and stainless steel shafts. Engine water will be circulated under the decks to keep them ice-free in the winter. For more information on Gladding-Hearn's capabilities,

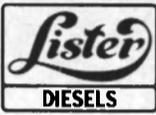
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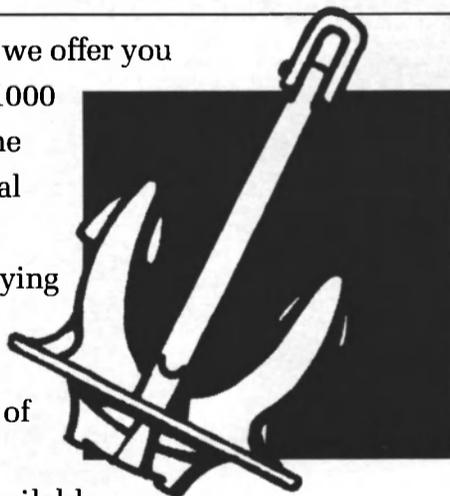
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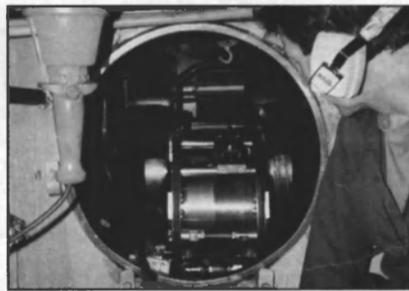
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In this case the 100 ton pneumatic hoists were used on site to level these 310 ton cranes. Incredible size and capacity ratio, precision engineering and construction, and their dependability on only 85 PSI compressed air operation made the JDN PROFI the perfect choice for the job.

But this hoist, and the rest of the world famous PROFI series, can operate at the same performance level mounted overhead on trolleys and in low overhead situations. They are unaffected by dampness, moisture, steam or heat, and the pneumatic operation makes them ideal for situations where sparks and electrical problems cannot be tolerated.

The ultra sensitive, pull cord speed regulation, built into every PROFI hoist, was key to this precision Navy operation. The ability of the hoists to be left running indefinitely without damage adds to the exceptional versatility of the PROFI Line.

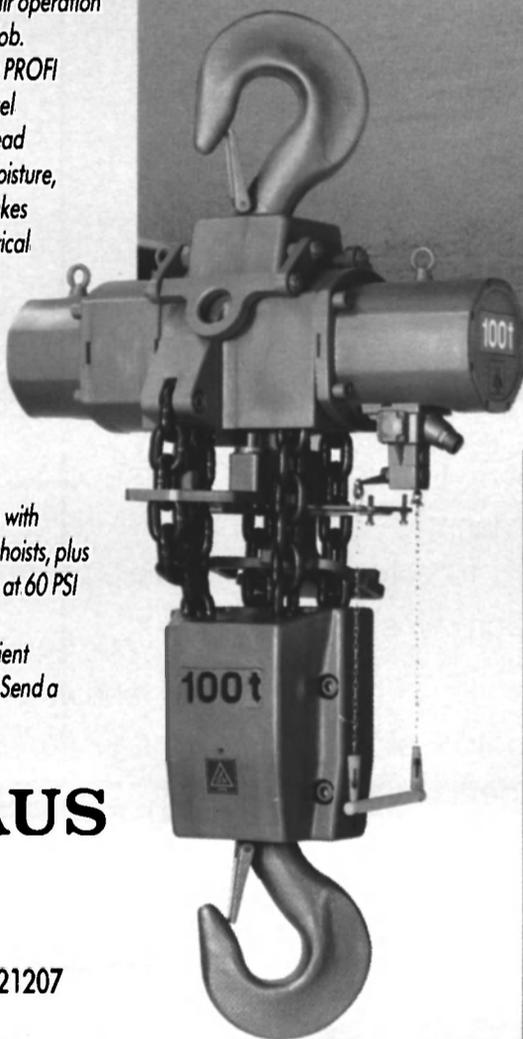
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AFDB-7/9200
Ser 212/1114
18 November 1987

From: Commander, Charleston Naval Shipyard
To: J.D. NEUHAUS, Baltimore, MD 21207

Subj: DELIVERY OF TWO 100 TON PNEUMATIC OPERATED CHAIN HOISTS
ON CONTRACT N00612-87-T531

Encl: (1) NAVSHIPYD CHASN Photograph of New AFDB-7 Crane Lift
in Holy Loch Scotland (3 copies)

1. The purpose of this letter is to commend your Mr. Donald T. Plettenberg for his dedicated support and exemplary performance in the handling of many details for delivery of the two 100 ton chain hoists on our Contract N00612-87-T531. NAVSHIPYD Charleston appreciates the quick action and delivery to support our schedule for loading the two new portal cranes and shipment to Holy Loch.
2. Enclosure (1), shows the new (310 ton lift) cranes being moved in Holy Loch by SMT International floating crane, YAE LIPT-6 to US Navy Drydock, USS LOS ALAMOS (AFDB-7). Your 100 ton pneumatic powered chain hoists are used to level the new portal cranes so that the sixteen wheels will land on the rails simultaneously. The project was a great success as one new crane was loaded in the morning and the other one in the afternoon.
3. Please present one of these photographs to Mr. Plettenberg with our sincere appreciation for a job well done.

A. H. Anderssen
A. H. ANDERSSEN
Acting

HydroComp Releases Version 3 Of NavCad™

HydroComp Inc., of Durham, N.H. unveiled Version 3 of its NavCad™ ship propulsion software package, aimed at marine professionals: shipyards, consultancies and propulsion equipment manufacturers. Version 3 utilizes an integrated graphical interface as the analysis environment. Recalculation spreadsheet capabilities are expanded, and a new graphing system can print full-page formatted plots. Version 3 uses easily-readable ASCII files for data storage, and incorporates features such as: equilibrium planing analysis, with effect of hull, appendage, flaps, thrust and wind; initial standardization of predictions to model scale via original model test methodology; improved correlation to test or trial data, including straight extrapolation; added resistance calculations for shallows water channel resistance, and towed barges and fishing nets; and interactive parameter range checking.

For more information on HydroComp,

Circle 124 on Reader Service Card

Sulzer Redesign Increases Power Of RTA84C Engine

New Sulzer Diesel has increased the maximum continuous power output of the RTA84C engine by six percent. The upgraded engine now gives 4,050 kW/cylinder at 102 rpm, so the output of the 12-cylinder RTA84C has been increased to 48,600 kW. Component improvements have been applied so the reliability and durability of the engine are maintained or surpassed.

For more information on Sulzer Diesel engines,

Circle 126 on Reader Service Card

\$1.2 Million Yamaha Order For Volvo Penta

Volvo Penta Asia Pacific has received an initial order, valued at around \$1.2 million, for AD31/DP stern drives.

Yamaha, reportedly Japan's biggest producer of leisure boats, is to redesign the popular Tackle 25 sportfisher around Volvo Penta AD31/DP Aquamatic diesel stern drives — direct-injected turbocharged and aftercooled four-cylinder, 2.4 liter diesel engines with Duoprop drives.

Public demand in Japan is now for functional 22- to 26-foot sports boats such as the Tackle 25, with good performance and speeds in excess of 30 knots. Price has become important, so diesel stern drive sales are reportedly challenging the outboard market.

Volvo Penta recently introduced a 150-hp (crankshaft power) version of the AD 31, bringing to boat builders and owners improved per-

formance for boats ranging from 20 feet to about 30 feet. For more information on Volvo Penta's products,

Circle 125 on Reader Service Card

Reintjes And Berg To Combine Products In Gear/Propeller Package

Reintjes and Berg Propulsion AB

have reached an agreement to enter international markets offering their products — gearboxes and propeller drives, respectively — as package systems. Both companies will remain independent.

Reintjes was founded in 1879 and has been producing gearboxes exclusively since 1929. The present gearbox program serves an engine output range of 250 to 10,000 kW. To date, they have supplied more than 70,000 marine gearboxes.

Berg was originally founded as a

shipyard in 1912, and since 1927 has been manufacturing cp propellers for power ranges covered by the Reintjes gearbox program. More than 6,000 systems have been sold to date.

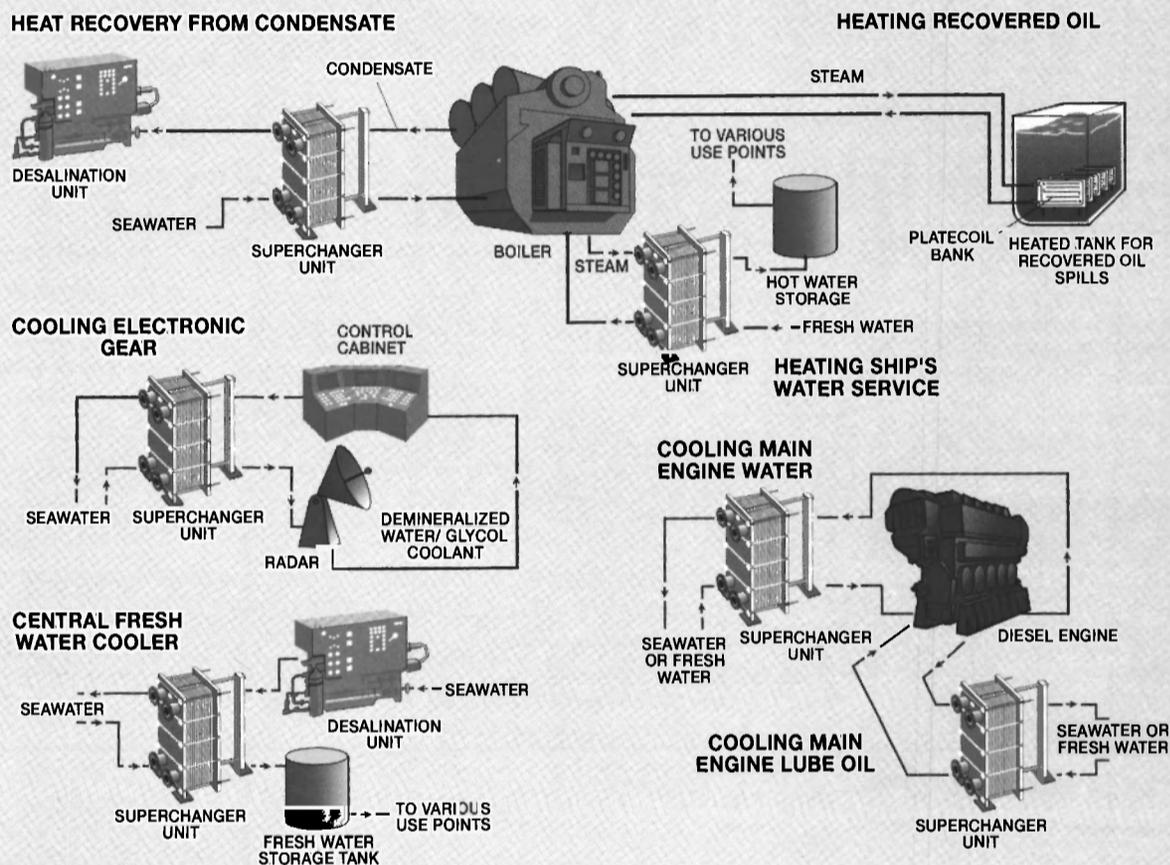
For more information on Reintjes,

Circle 127 on Reader Service Card

For more information on Berg Propulsion AB,

Circle 128 on Reader Service Card

How to Operate More Efficiently At Lower Cost With Tranter Plate-type Heat Exchangers



Naval ships, fleet oilers, commercial containerships, tankers and dredges are successfully finding new ways to operate more efficiently at lower cost, by utilizing Tranter's unsurpassed plate-type heat exchanger technology. Schematics presented here illustrate typical ways they are doing it.

Superchanger® plate and frame heat exchangers are used in a wide variety of shipboard applications—particularly for cooling main engine jacket water and cooling main engine lube oil with fresh water or seawater; cooling the ship's central fresh water; cooling electronic equipment; or recovering heat from condensate. They are far more efficient than tubular systems, and provide heat transfer coefficients from two to five times greater than those achieved by shell and tube units. They also require 10% to 50% less deck space and weigh up to one-sixth less.

Superchanger units can be equipped with titanium plates which offer the best resistance to corrosion and erosion when exposed to seawater. Intermixing or cross-contamination

of hot and cold liquids is virtually impossible. Low fouling rates reduce cleaning requirements for Superchanger units, that are designed for easy maintenance. They can be cleaned-in-place by backflushing, or quickly disassembled by hand, cleaned and put back in operation.

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Tranter plate-type heat exchangers can be supplied in full compliance with codes and specifications as required by the ABS; the U.S. Coast Guard; shock testing per MIL-S-

901C; vibration testing per MIL-STD-167-1; and ASME U stamp per Sec. VIII Div. 1.

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Circle 235 on Reader Service Card

Superior Environmental Services Creates Marine Response Group

Superior Environmental Services, Hazardous Waste Group Inc., a division of Superior Environmental Services Inc. of West Allis, Wis., jointly announced the formation of the Great Lakes' largest marine response coalition.

Superior has teamed with: Smit Americas of Houston, which will be its primary salvage company; Hannah Marine Corporation of Lemont, Ill., which is one of the largest marine transportation firms in the Great Lakes; and International Marine Systems of Milwaukee, Wis., which specializes in underwater location and specialty diving operations.

The group will initially provide

marine spill response, salvage, emergency lightering, and vessel firefighting that meets the requirements of the Oil Pollution Act of 1990. The group's initial coverage area is all U.S. Coast Guard (USCG) Captain of the Port Zones for the Great Lakes Region.

For more information on this Great Lakes marine response coalition,

Circle 16 on Reader Service Card

Motor-Services Hugo Stamp Changes Address

As of September 1, Motor-Services Hugo Stamp, Inc. is the authorized service center for MAN B&W Engines. Motor-Services Hugo Stamp, Inc. moved to a new facility on October 22, 1993. The new address is 3190 S.W. 4 Avenue, Ft. Lauderdale, Fla. 33315. A grand opening and Oktoberfest was held to commemorate the occasion. The company is now the authorized distributor and service center for the following engines: Deutz MWM, MaK, GMT and MAN B&W. Motor-Services Hugo Stamp's telephone number, fax number and telex will remain the same.

For more information on Motor-Services Hugo Stamp, Inc.,

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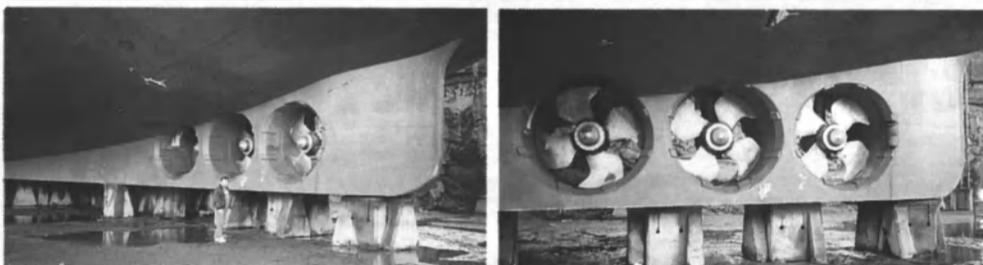


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Circle 240 on Reader Service Card

PSRY Completes Grit Blast Containment Curtain Installation

The Portland Ship Repair Yard (PSRY), which reportedly handles more than a third of the commercial ship repair done on the West Coast, is home of the largest floating dry dock in America and one of the best equipped and modern ship repair facilities in the U.S.

The yard can accommodate scrapping of ships to 1,000 feet in length. PSRY recently provided proposals for ship dismantling sites to 21 companies in the U.S. and abroad.

In September of 1993, the first grit blast containment curtain was installed on Dry Dock 3, followed by the installation of curtains for Dry Dock 1 in November. The curtain on Dry Dock 3 was used for work performed on the Maersk Constellation. Equipment designed to control fugitive emissions from interior tank grit blasting was tested by Cascade General at PSRY, and equipment tested during work on the S/R Long Beach was reported to be successful.

For more information on Portland Ship Repair Yard,

Circle 19 on Reader Service Card

Neptune Applies To MarAd For Permission To Sell Cargo Ship

Neptune International has applied to the Maritime Administration for permission to sell the Chablis, a 19,030-dwt cargo vessel.

The proposed buyer is Neter Navigation SA of Singapore, which plans to resell the vessel to Rajeev Shipbreaking Yard in Bombay, India for eventual scrapping in Alang, India.

MarAd's permission is required under the Shipping Act of 1916.

Maritime Reporter/Engineering News

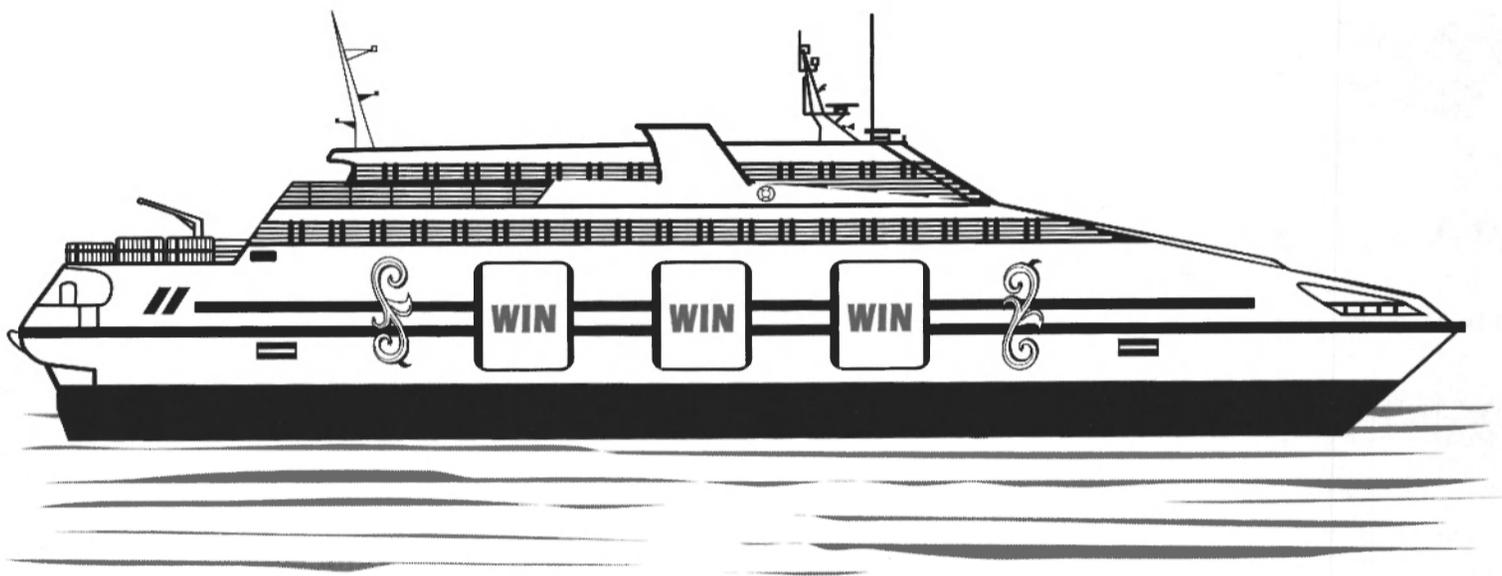
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Flender Werft Delivers Second Vessel, M/V Spes, To Italian Grimaldi Group

Flender Werft AS of Germany delivered the Ro/Ro car and container carrier M/V Spes to Industria Armamento Meridionale SpA, Grimaldi Group.

M/V Spes is designed for carrying cars, trailers, trucks, buses, transporters, containers and general

cargo, which will be loaded via a quarter ramp as well as via a portside ramp. The cargo will be stowed inside the ship on five fixed decks as well as on four hoistable decks.

Two Sulzer 8 ZA 40 S diesel engines, having an output of 5,760 kW each, will propel the ship by operating a cp propeller, giving the ship a service speed of 19 knots.

One shaft generator of 1,250 kVA, as well as three diesel generators of 870 kW each, will provide the electricity at sea and also guarantee the

board operation.

M/V Spes is 584 feet long, with a breadth of 88 feet, depth of 88 feet, draft of 29 feet and dwt of 16,500.

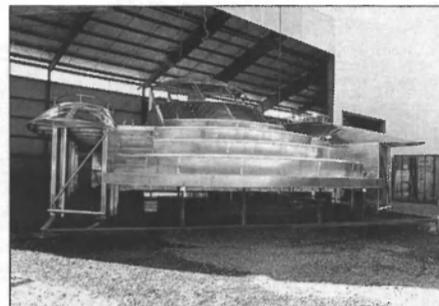
This is the second ship of a series being built for the Italian Grimaldi Group.

Flender Werft has on order two new buildings, employing the shipyard until the end of 1994.

For more information on Flender Werft,

Circle 47 on Reader Service Card

Workboats Northwest Helps Construct Passenger Structure For Hawaii's Navatek II Swath Vessel



The deck structure of the Swath vessel Navatek II, which will be used as an excursion boat off the Hawaiian Islands, was built in a high bay building at the Seattle shipyard Workboats Northwest. The overall structure, while stout enough to carry passengers at sea, weighed only 16,000 pounds when shipped.

The Navatek II Swath vessel, being built for Royal Hawaiian to operate on cruises in Hawaii, presented a special challenge in fabricating the extremely lightweight 72-foot by 36-foot upper deck structure - a challenge that Workboats Northwest, Inc. of Seattle, Wash. met with extensive use of structural adhesives along with precision welding.

While the deckhouse, sun and bridge decks sit on a rugged framework designed to carry passenger loads, most of the non-load bearing bulwarks and stiffeners were affixed to frames with the use of acrylic structural adhesives.

Workboats Northwest earlier prepared precision cut plates and shapes for the underlying "carrier vessel," including the Swath hulls on which the vessel runs, for assembly at Honolulu Shipyard in Hawaii.

The Seattle firm's latest contribution to the vessel included not only plasma cutting of component parts but constructing the whole structure above the main deck.

The Navatek II is expected to be in service by January 1994. The vessel incorporates design features developed by Navatek Ships, Ltd. of Honolulu, Hawaii, and the Marine Systems Division of Lockheed Missiles & Space Company, Sunnyvale, Calif.

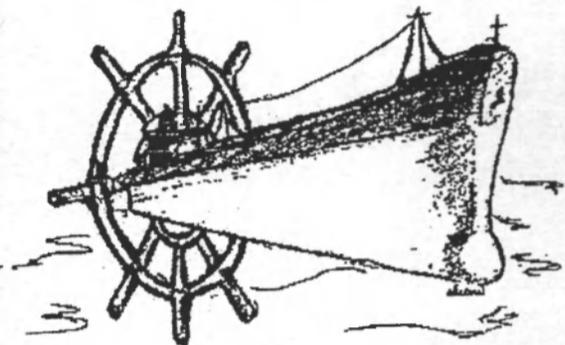
For more information on Workboats Northwest, Inc.,

Circle 23 on Reader Service Card

MarAd Awards \$3.3 Million Contract

The Maritime Administration has awarded a \$3.3 million contract to Stevens Technical Services, Brooklyn, N.Y., for activation, upgrades, modifications, repairs, sea trials and deactivation of the Ready Reserve Force (RRF) vessel Cape May. The work includes repairs necessary to meet classification specifications and regulations.

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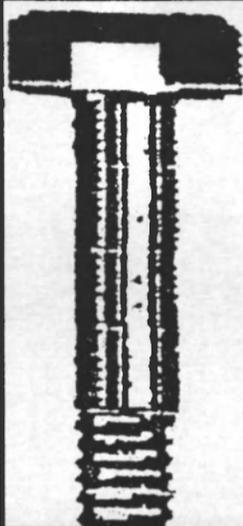
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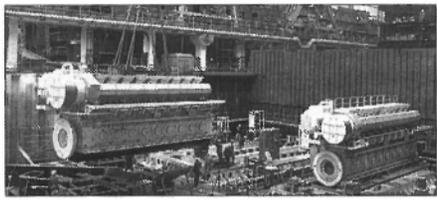
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Four MAN B&W Engines Unloaded At Meyer Werft; Installed In Cruise Liner "Oriana"



Four MAN B&W marine diesel engines were unloaded at what is reportedly the world's biggest covered building dock at Meyer Werft, Papenburg, Germany, for installation into the P&O cruise liner Oriana.

The marine diesel engines delivered from Augsburg on a river vessel were unloaded by yard cranes and then lifted into position so they could be taken over by the 600-ton crane inside the building dock.

By means of this crane the four MAN B&W diesel engines were inserted into the hull of the Oriana, where they will provide the vessel with a service speed of 24 knots.

For more information on Meyer Werft,

Circle 65 on Reader Service Card

Incentive Acquires MacGregor-Navire; Forms MacGregor Group

The international industrial group Incentive acquired the shares of MacGregor-Navire, the global market leader in shipboard cargo handling products from the Kone Corporation. Incentive is also the owner of Hagglunds Marine, the world leader in shipboard cargo cranes.

As a result of this acquisition, MacGregor-Navire and Hagglunds Marine are merged. The combined organization will be known as the MacGregor Group. The new group will supply the following shipboard cargo handling products: cranes; hatch covers; Ro/Ro equipment; lashing equipment; elevators and their service. The products are marketed under the brand name of MacGregor. However, the long established names of Hagglunds and Conver will be included in the brand names of cranes and lashing equipment in the form of MacGregor-Hagglunds and MacGregor-Conver, respectively.

Through the now 27 companies located in 23 major shipping and shipbuilding countries, the Group expands its local presence worldwide, thus enabling the organization to improve its service to its customers: the shipbuilders and shipowners of the world.

The service network consists of more than 50 wholly-owned service stations strategically located in major shipping centers offering 24-hour service around the world to a fleet of approximately 30,000 ships outfitted with MacGregor, Navire, Hagglunds and Conver products.

Heading the new MacGregor-Navire Group as its president is **Ulf Hedberg**, formerly the president of

MacGregor-Navire. **Peter Wide**, formerly president of Hagglunds Marine, has been appointed executive vice president of the new group.

For more information on the MacGregor Group,

Circle 72 on Reader Service Card

Schuyler Awarded Sixth Tractor Tug Fendering Contract

Schuyler Rubber Co., Inc. of Woodinville, Wash. has been awarded the contract to design and manufacture the complete fendering system for a 108-foot oil recovery tractor tug developed by Marco and currently being built in Taiwan for the Chinese Petroleum Corp. and the Republic of China.

The model SR3D fender has been tested extensively over the past 20 months in field trials. In addition, load deflection, energy absorption and fatigue resistance technical

data, which substantiates the "soft" performance of the fender, is available.

For more information,

Circle 20 on Reader Service Card

Dorbyl Marine Expands To Provide Ship Conversions

Dorbyl Marine Durban, world renowned for quick, reliable ship repairs, has expanded its capabilities to cover ship conversions such as jumboizing and major steel renewals.

Facilities now available to the Ship Repair Division include two shipways; two repair quays (each provided with piped oxygen, fresh and salt water, electric power, compressed air and telephone connection); well-equipped steel fabrication, pipe fabrication and machine shops; and a shipbuilding drawing office computerized for steel, piping and layout drawings, plate development, nesting and plasma cutting.

For more information on Dorbyl Marine,

Circle 28 on Reader Service Card

Morgan Marine Delivers Marine Cranes; Wins Contracts For Three More

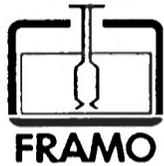
Morgan Marine of Santa Ana, Calif. delivered three knuckleboom cranes to Swiftships, Inc. to be installed on mine hunters being built for the Egyptian Navy. The contract was valued at more than \$130,000.

Morgan Marine has also received an order from Campbell Shipyard for three marine cranes to be installed on a vessel being built for a foreign customer. The contract is valued at more than \$90,000. Delivery is expected to take place in January 1994.

Morgan Marine is a manufacturer/distributor of knuckleboom and telescoping boom marine cranes.

For more information on Morgan Marine,

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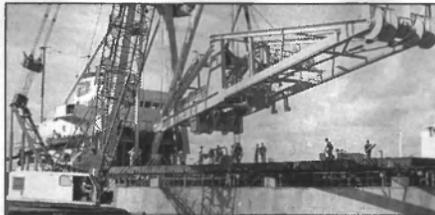
• Digital Wind Sensor

• Visibility sensor

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Port Of Miami Adds Two New Mobile Container Cranes From Germany

The newest additions to the Port of Miami's cargo-handling equipment - two mobile container cranes - were unloaded in sections from the vessel The Barde Team, which arrived from Rotterdam, Holland. Manufactured by the Mannesmann Demag Corporation of Germany, the 280-ton Gottwald mobile cranes are



part of the Port's \$400 million expansion and upgrade program to completely modernize its cargo handling facilities. The investment in new equipment will allow for a higher volume of container movement through the port at a given

time. The two mobile cranes are to be utilized at the Lummus Island gantry facility to supplement the six 40- and 50-long-ton fixed cranes currently in operation. With a reach of 148 feet, the cranes have the capability of loading and unloading 25 containers per hour and can hoist up to 110 tons of heavy lift. The cranes were assembled and operational by mid-November.

For more information on the Port of Miami,

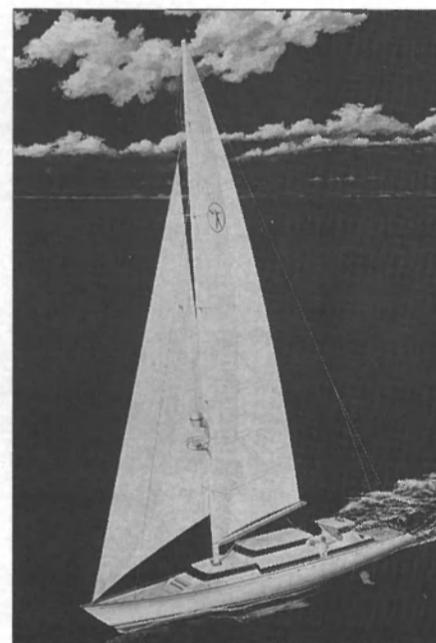
Circle 64 on Reader Service Card

World's Largest Sloop Sets Sail With Simrad-Robertson Vessel Control Systems

The world's largest sloop, the 150-foot motor sailing yacht Zeus, recently set sail on her maiden voyage equipped with the Simrad-Robertson Commander, reportedly one of the most advanced steering systems in the marine market today.

Outfitted with the world's tallest carbon fiber mast at 175 feet and sail area of 6,600-sq.-feet, the wing keeled Zeus is expected to be the fastest mega sailing yacht in the world, achieving speeds off the wind of between 20 and 30 knots. The realization of a dream of owner **Angus Robertson**, the Zeus is meticulously finished, from her six lavish, exotic wood-accented state-rooms to her powerful, clean-burning, resiliently mounted 680-hp MAN B&W diesel main engines, to her impressive, sophisticated electronics suite.

The Simrad-Robertson Commander, part of the company's proven family of multipurpose pilot steering systems widely used in the offshore, research and military marine markets, enables the master to have accurate fingertip control of the megayacht not only when in transit, but also when maneuvering in restricted waters. The Commander combines the Simrad-Robertson AP9MKII, one of the world's most advanced autopilots, with integrated joystick control of the megayacht's bow thruster, main engines, propellers and rudders.



Designed for optimal automatic steering, the AP9MKII autopilot accepts position reference information from all common vessel navigation and position receivers including gyro and magnetic compass input. The unit has a built-in interface for navigation receivers with an NMEA 0180 or 0183 output, making waypoint steering possible.

For more information on products offered from Simrad-Robertson,

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Today, rope manufacturers have found that they require a higher level of performance plus cost-effectiveness for the most demanding applications, such as: tethers for balloons, underwater surveillance systems, offshore oil rigging and transmission and distribution (T&D) lines. ACE Polyester SeaGard meets these requirements. And, for the sailor who wants the best in performance, SeaGard ropes offer that certain added security plus easy, smooth handling.

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Star Casino Launches Louisiana Gaming Boat Business

Vessel Built At Bender Shipbuilding; Operated By Showboat, Inc.

by Erin O'Driscoll, assistant editor



The burgeoning gaming vessel market marked a symbolic first with the dedication, christening and official opening of Star Casino, Louisiana's first modern riverboat casino.

"With the dedication of this vessel, we herald the beginning of a new era in Louisiana's gaming history," said **Louie Roussel**, majority owner of Star Casino, Inc. and well-known New Orleans businessman, entrepreneur and philanthropist. "We are proud to be the first riverboat casino to come on-line in Louisiana. We want to assure the public that the Star Casino will continue to be 'first' for many years to come ... first in customer service, first in quality entertainment and fun, and first in fairness and integrity of operation," Mr. **Roussel** continued.

After a few setbacks with the U.S. Coast Guard and New Orleans City Council members, Louisiana's first riverboat casino was on its way to making riverboat gaming history. The 265-foot Caterpillar-powered Star Casino boasts an impressive equipment list with the likes of

Raytheon VHF radio and radar, Thrustmaster thrusters, engine controls and steering controls, and a Ritchie Compass. Star Casino is a tri-level, 22,500-sq.-ft. floating Las Vegas-style casino with a beam of 80 feet and a 14-foot draft. The Star Casino has a capacity for approximately 1,250 guests. The onboard entertainment features a number of games of chance, including 760 slot machines; 39 gaming tables for blackjack, craps, and roulette; and video poker.

The \$12 million vessel was constructed in about eight months by Bender Shipyard in Braithewaite, La. Claire Amiss, marketing manager of Star Casino, Inc., says Bender was chosen to build the Star Casino based on the company's fine reputation.

Mr. **Roussel** wishes to convey the importance of the fact that Louisiana's first gaming riverboat will be locally-run. "This is a locally-owned, locally-constructed riverboat casino, that is providing jobs for approximately 1,000 people in the New Orleans area. Our annual payroll will be about \$17 million,"

Mr. **Roussel** commented. "Even before opening, the Star has made a very positive impact on our local economy, and will continue to do so, because the Star Casino is a locally owned and operated boat. That means salaries and winnings as well as the profits and taxes stay right here in Louisiana instead of leaving our state," Mr. **Roussel** continued.

The riverboat docks at the Star

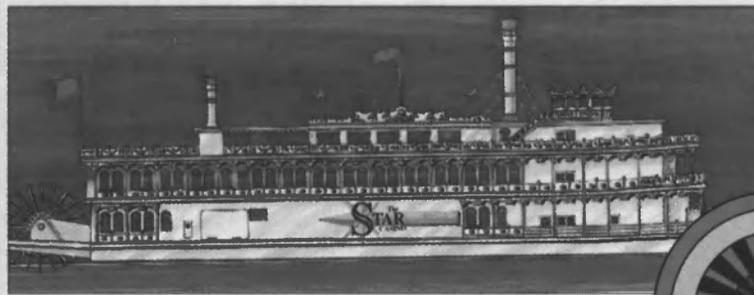
Casino Terminal, a 34,000-sq.-ft. modern building which houses an information booth, reservations booth, restaurant, gift shop, cocktail bar and the security operations center of the Star Casino.

Security at Star Casino is of primary importance, according to Mr. **Roussel**. The security system is elaborate and features state-of-the-art equipment. **Walter J. Tirrell**,

(Continued on page 26)

Bender Shipbuilding has been busy constructing not only the Star Casino but six other gaming vessels for various owners. Bender delivered the "Cotton Club" casino vessel, a converted ferry, in September 1993 to Cotton Club of Greenville, Miss. Other vessels under construction at Bender include:

Vessel Name	Dimen.	Engines	Owner	Deliv.
Treasure Chest Casino	260x78	Caterpillar	Treasure Chest Inc.	1/94
Horshoe	295x78	MTU	Horseshoe Entertainment	2/94
Harrah's Kansas City	295x78	Caterpillar	Promus Co.	5/94
Casino Rouge	260x78	Caterpillar	Louisiana Casino Cruises, Inc.	6/94
Lady Luck	320x78	Caterpillar	Lady Luck, Inc.	8/94
Elgin Lady	400x114	Caterpillar	Nevada Landings/Hyatt	10/94



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In the high-stakes business of riverboat gaming, it pays to place your bets on a winner. From the very beginning of the riverboat casino boom, Bender Shipbuilding has delivered boat after boat — on time and on budget. With five riverboat projects completed and ten under construction, Bender is the nation's top builder of casino riverboats and dockside casino barges.

When Illinois river waters opened to gaming, Bender's swift 90-day conversion raced the *Alton Belle Casino* to this market far ahead of its competition.

Since this record-breaking beginning, Bender has set the industry standard for rapid delivery in a business where time means everything.

Bender's conversion of the sleek casino riverboat *Silver Eagle*, operating in Galena, Illinois, was completed in less than 45 days. *Splash*, a 400-foot casino/restaurant barge operating south of Memphis in Tunica, Mississippi, was converted by Bender in less than 120 days. Bender recently

completed the first riverboat casino projects in Vicksburg and Greenville, Mississippi. Before the end of 1993, Bender will complete the first two riverboat casinos in the state of Louisiana.

Bender has casinos under construction for Louisiana, Illinois, Mississippi, Missouri and Iowa, and is developing markets in Indiana.

With this impressive track record, Bender offers you turn-key entry into the river casino business. Our experienced staff is fully knowledgeable in gaming regulations in all states and can serve as



your guide through all the red tape. From initial design and concept, we can assist you with site development, securing financing, interior design, food and beverage planning, land-based support facilities — everything you'll need to get you to opening day.

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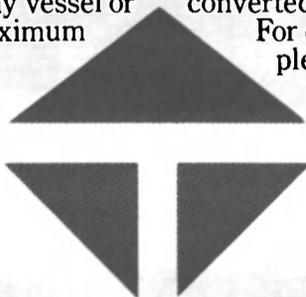
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GE Appoints Shade General Manager Of Navy & Small Steam Turbines



Russell Shade

GE Industrial & Power Systems has appointed **Russell L. Shade** general manager of Navy & small steam turbine business. He will be located in Fitchburg and will head the Fitchburg and Lynn, Mass. facilities.

Mr. **Shade** will oversee steam turbine and gear activities in the naval and commercial marine markets, which include the design, production and sale of ship propulsion

units and turbine generators for on-board power generation. He will also oversee steam turbine products for the commercial industry and utility markets in applications such as mechanical drive, industrial turbine-generator sets, and boiler feed pump turbines.

During his 20-year career with GE, Mr. **Shade** has held numerous management positions within the GE Power Generation engineering and production organizations. Most recently, he served as manager, Fitchburg manufacturing.

For more information on GE,

Circle 32 on Reader Service Card

Kratzer Promoted; Edenson Joins Textron

James W. Kratzer, formerly vice president of finance and administration at Textron Marine Systems, has been promoted to executive vice president. In this capacity, he will oversee the financial operations of the division, as well as assist in general division management activities, and have significant involve-

ment with developing new business opportunities. Mr. **Kratzer** has been with Textron Marine Systems since 1984.

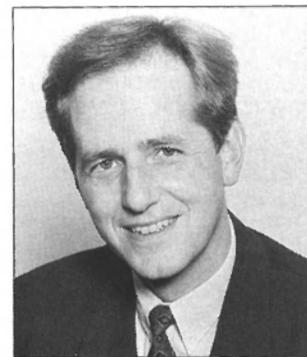
Irwin F. Edenson, formerly of Sperry Marine, has joined Textron as vice president, business development and marketing. In his new role he will be responsible for implementing all marketing- and business development-related activities with an emphasis on foreign sales.

A U.S. leader since 1961 in the design and construction of advanced technology air cushion vehicles and surface effect ships, Textron Marine Systems, a division of Textron Inc., serves both military and commercial interests and maintains a significant commitment to independent research and development.

Koerhuis Appointed Vecom Marketing Director

The Vecom group has appointed **Raymond G.M. Koerhuis** marketing director, based at Maassluis, Holland, with responsibilities for supporting the company's global marine supply business. Mr. **Koerhuis**

brings to Vecom an extensive business background, most recently in the field of technical publishing, and his appointment reflects Vecom's commitment to the development of



Raymond Koerhuis

shipboard quality care through service/equipment/chemical packages.

"The trends toward smaller crews with aging ships, and a general decline in shipboard capability, is providing an opportunity for Vecom to solve maintenance problems with full service/support programs," stated Mr. **Koerhuis**. "We find that our system approach can reduce shipboard operating costs over a relatively short time period."

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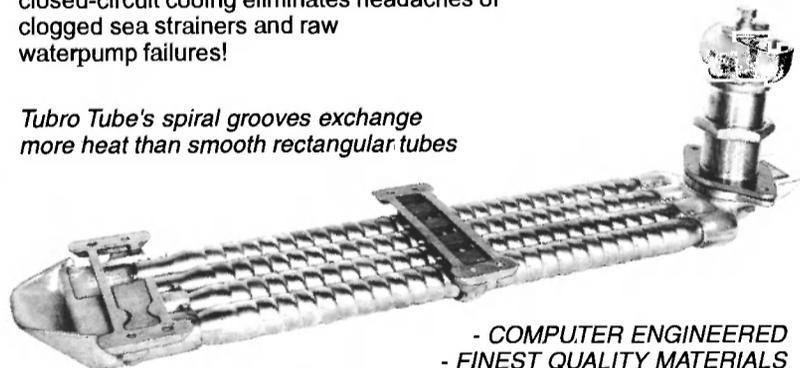
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(Continued from page 22)

**Star Casino :
Louisiana's First
Riverboat Casino**

director of security, claims that the entire Star Casino complex is monitored and patrolled 24 hours a day to ensure the safety of employees and guests.

The Star Casino operator is the

well-known casino company Showboat, Inc., an operation with successful gaming establishments in Atlantic City and Las Vegas.

Keith Wallace, former general manager of the Showboat Casino in Las Vegas, will serve as executive vice president and chief operating officer.

Mr. **Wallace** has played a major role in the start-up of Star Casino, and his history of casino management experience qualifies him to di-

rect the Star Casino team.

A black-tie celebration was held at the Star Casino Terminal at South Shore Harbor on Lake Pontchartrain in New Orleans, La. in late October. A formal christening ceremony for the 19th century paddlewheel replica was held at the terminal with state and local dignitaries participating. Governor **Edwin W. Edwards**, Mayor **Sidney Barthelemy**, Senate President **Sammy Nunez**, and Speaker of the

House **John Alario** joined the Honorable **Robert G. Harvey**, president, Board of Commissioners of the Orleans Levee District, and Mr. **Roussel** to dedicate the boat and to officially open Star Casino, followed by a fireworks display over Lake Pontchartrain, the largest single lake in the U.S., where the Star Casino will operate 365 days a year.

Star Casino officially opened for business on November 8.

The gaming vessel market has been gaining support across the U.S., with Indiana's recent legalization of riverboat gaming prompting 28 applications for that state's 11 licenses.

Other states are not far behind, and sources within the industry estimate that Ohio and Texas are two states likely to join the riverboat gaming ranks soon.

Louisiana, which has been one of the more active states legislatively from the beginning of the boom, will one day have 15 riverboat gaming vessels licensed in the state, as dictated by current law.

The gaming vessel market has obviously resulted in a much-needed boost for many shipyards attempting to make the change from the Navy business of the past to the booming commercial business of the future. Equipment manufacturers have also profited from the extra business, a testimony to that being the Star Casino's impressive equipment list.

The following manufacturers helped make the Star Casino a reality in just eight months:

Main engines	Caterpillar
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Thrusters	Thrustmaster
Thruster engines	Caterpillar
Generators	Kato
Engine controls	Thrustmaster
Steering controls	Thrustmaster
Deck machinery	McElroy Capstan
Coatings	Devoe
VHF radio	Raytheon
Radar	Raytheon
Compass	Ritchie
Bilge pump	Gould
Fire pump	G&L
Other equipment	IGT slot machines

For more information on Bender Shipbuilding,

Circle 70 on Reader Service Card

For more information on Star Casino,

Circle 92 on Reader Service Card

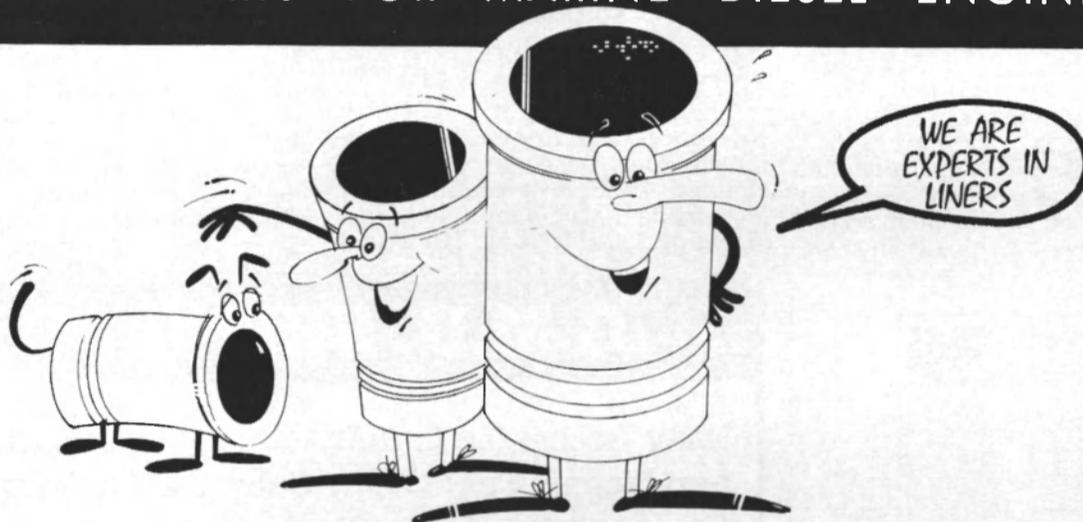
**West Virginia Passes
Riverboat Gaming In 1994**

The West Virginia Riverboat Gaming Association (WVRGA) announced that West Virginia will be the next state to allow riverboat gaming. The WVRGA is a statewide trade organization of riverboat gaming operators, related interests and professionals committed to riverboat gaming excellence through its representation of the industry.

For more information on WVRGA,

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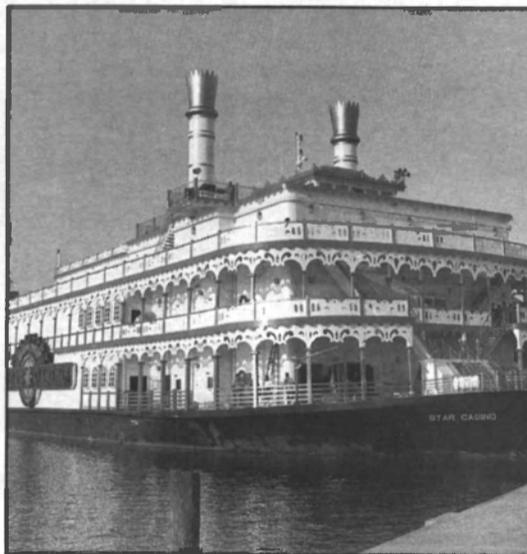
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Gore Speaks At Carrier Christening In Newport News

Vice President **Al Gore** was the principal speaker at the christening of the 1,092-foot-long Nimitz Class nuclear aircraft carrier John C. Stennis (CVN 74) at Newport News Shipbuilding (NNS), Newport News, Va. An estimated 3,000 people showed for the event on Thursday, November 11 — Veterans Day.

The Vice President said in his remarks that while military power assists short-term national security, economic power is essential in the long-term. "Now that the Cold War is over, the shipbuilding industry faces a new challenge. American shipbuilders must transfer their technical skills from the military to the commercial market," Mr. Gore said. He reassured those present that the Administration would help, citing the five-point plan President Clinton delivered to Congress October 1 to revitalize the shipbuilding industry. He said the plan would "supply important assistance to this talented work force here at Newport News — and in other shipyards around the country."

Other speakers at the ceremony included **John H. Dalton**, secretary of the Navy, who introduced Mr. Gore; Sen. **Thad Cochran**, Miss.; Sen. **Charles Robb**, Va.;

Sen. **John Warner**, Va.; **Dana Mead**, chief operating officer of Tenneco Inc., NNS's parent company; and **W.R. "Pat" Phillips, Jr.**, president and CEO of NNS.

The Stennis was christened by **Margaret Stennis Womble**, daughter of the man it was named for, who smashed the bottle across the Stennis's bow with a single stroke, predicting good luck for the ship. The end of the ceremony was punctuated by an impressive fly-over by four screaming jets in close formation.

Before it is completed and delivered in 1996, the Stennis will take about 40 million man-hours and almost five years to construct, incorporating 47,000 tons of structural steel and about a million pounds of aluminum. The Stennis towers twenty stories above the waterline and is almost as long as the Empire State Building is tall. It will be the home for about 6,000. It is capable of 30-plus knots, has two reactors which can operate 20 years without refueling, and can remain operational for half a century.

There have been six other Nimitz Class carriers: the Nimitz, the Dwight D. Eisenhower, Carl Vinson, Theodore Roosevelt, Abraham Lincoln and George Washington. The next Nimitz Class carrier, the United



Vice President **Al Gore** spoke on the future of U.S. shipyards when the John C. Stennis aircraft carrier was christened at Newport News.

States, is scheduled for christening in 1996. The Enterprise (CVN 65), the first nuclear aircraft carrier, was delivered by NNS in 1961 and is now undergoing a major overhaul and refueling there.

Sen. **Warner** of the Armed Services Committee announced at the christening that the Senate had approved \$1.2 billion for yet another nuclear aircraft carrier, CVN 76.

Former Mississippi State Senator **John C. Stennis**, age 92, for whom the aircraft carrier was named, was a Senate advocate of military strength and served 41 years under eight presidents, be-

ginning with **Harry Truman** in 1947 and ending with **Ronald Reagan** in 1988. He retired from the Senate in 1988 and now resides in Madison, Miss.

For more information on Newport News Shipbuilding,

Circle 93 on Reader Service Card

Navy Secretary Dalton Lauds Gore, And NAFTA

In Secretary of the Navy **John Dalton's** introduction of the Vice President, he lauded **Gore's** efforts on behalf of the North American Free Trade Agreement (NAFTA), which at press time had just passed the House of Representatives. "He has stood tall in the championing of the North American Free Trade Agreement, which means a much brighter economic future for us all. People ask me why I'm so interested in NAFTA ... I know in order to build carriers like this, and the air wings that will be aboard her, and the other ships that will be part of her battle group, a growing economy and a strong industrial base are absolutely essential. It is only through wise trade policy like NAFTA that we will be able to maintain an economy that will adequately support our national defense needs. **Al Gore** is leading a fight for both a healthy economy and a strong defense."

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Kvaerner Delivers Third Super-Cruise Liner To Carnival



Sensation and Fascination at the outfitting quay at Kvaerner Masa-Yards Helsinki New Shipyard.

The delivery of the M/S Sensation, the third Caribbean cruise liner from Kvaerner Masa-Yards' Helsinki New Shipyard for Carnival Cruise Lines, Inc., USA, took place on October 18, 1993. The vessel left Helsinki on October 23 for her home port of Miami. After having crossed the Atlantic, the vessel was christened in Miami on November 13. The inaugural cruise took place on November 21.

M/S Sensation is the third Super-cruise liner delivered to Carnival Cruise Lines, Inc. from the Helsinki New Shipyard. M/S Fantasy, the first in the series, was delivered in 1990. The sistership M/S Ecstasy was delivered in 1991. The fourth and fifth vessel in the series will be delivered in the summers of 1994 and 1995, respectively. With grt of 70,367, the M/S Sensation can carry 2,600 passengers, served by a crew of more than 900. She is 855 feet long, with a beam of 103 feet and a draft of 25 feet. The ship has a number of unique features, including the six-deck-high atrium with glass walled elevators, and extensive use of materials such as marble and granite.

M/S Sensation also features a diesel-electric power plant with electrical propulsion motors. The total aboard power developed is 42,240 kW (57,400 hp). There are six thrusters, three forward and three aft, with a total power of 9,000 kW (12,200 hp).

For more information on the capabilities of Kvaerner Masa-Yards,

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Fourth Litton-Built Aegis Destroyer Christened "Russell"; SA'AR 5 Corvette Completes Sea Trials



DDG-59 was christened "Russell" at Ingalls Shipbuilding division of Litton.

Ingalls Shipbuilding division of Litton in Pascagoula, Miss. christened the fourth Aegis guided missile destroyer "Russell."

The new ship, designated DDG-59, is the ninth vessel of the Arleigh Burk (DDG-51) Class. To date, Litton has contracted to build 11 of the ships and delivered the first vessel last year. Also, Ingalls' first SA'AR 5 corvette has completed sea trials. INS Eilat, the first of three SA'AR 5 corvettes being built for the government of Israel by Ingalls Shipbuilding, completed initial sea trials in the Gulf of Mexico in October.

For more information on Ingalls Shipbuilding,

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As U.S. shipyards convert from primarily navy work to commercial work, they will find many lucrative markets, including the burgeoning cruise ship market.

SHIPBUILDING OUTLOOK

The Outlook For U.S. Shipbuilding

By James R. McCaul, president
IMA Associates, Inc.

Commercial shipbuilding in the U.S. is about to rebound in a big way. We see the U.S. industry emerging as a competitive force in world commercial shipbuilding, with the industry successfully competing for important orders over the next 12 to 24 months. That is the conclusion of a detailed study of the future U.S. marine industry recently published by IMA, highlights of which are provided in this article.

The business setting for shipbuilders and other companies in the U.S. marine sector is very promising. While the Navy market will be substantially below that of the past ten years, there are major growth opportunities in the export market for commercial ships. There are also some near term orders in the Jones Act market and revenues from future Navy work will continue to be substantial. There are several domestic and international forces which will shape the market.

Internationally, current forecasts call for worldwide ordering of new ships to increase 35 to 80 percent over the next five years, driven primarily by the need to replace aging tankers. Looking at individual situations, Japanese shipbuilders are being impacted by the strong Yen, Korea has a capacity problem, Northern European builders have been hurt by high labor costs, and

Eastern European builders have been plagued by political unrest. All the while, U.S. builders have excess capacity and relatively low labor costs.

The U.S. government has also helped pave the way for a resurgence. Government policy has suddenly shifted in favor of shipbuilding, with the proposal to expand federal financing guarantees to ship export orders and provide significant seed money for commercial ship systems development. The increased shipbuilding demand, changes in the competitive picture and more supportive government policies will cause U.S. shipbuilding to evolve into a more balanced mixture of commercial and naval ship construction.

Market Assessment

By Vessel Type

The IMA report identifies eight business segments which offer the greatest near term export prospects for U.S. shipbuilders. The full report profiles the operating inventor in each segment, assesses underlying business drivers, examines technology developments likely to affect future ship design and forecasts the available ship construction market over the next five years. Here is a glimpse at how we see the opportunities for each of the segments.

- **Product Tankers:** growing demand for petroleum products and

substitution of imports for domestic refined products will create a need for up to 350 product tankers to service U.S. import trade.

- **Crude Carrier:** OPA 90 regulations, concerns over aging tankers and physical obsolescence will produce significant requirements for double hull replacement ships.

- **Liquefied Gas Carriers:** Newport News looks poised to take an LNG ship export order and growing demand for natural gas, propane, butane and other petroleum gases will produce further LNG/LPG ship construction opportunities.

- **Parcel Tankers:** owners have begun scrapping first generation parcel tankers and a continued flow of orders for expensive, stainless steel chemical carriers is forecast.

- **Cruise Ships:** major operators in the Caribbean and West Coast cruise trade will continue to upgrade their fleets with new ships, as well as modernize existing vessels.

- **Containerships:** increased trade and replacement requirements will generate orders for new ships, with U.S. owners being major players in future orders for container megaships and feederships.

- **Floating Power Plants:** lots of export potential in developing countries and Wartsila has been aggressively pursuing this market in collaboration with McDermott.

- **Floating Production Plants:** there continues to be interest in barge-

mounted methanol and ethanol plants, but economics depend on future energy prices.

The report takes an equally extensive look at the Jones Act (domestic) market, and finds: OPA 90 will generate some product tanker replacement requirements, as 105 of 160 domestic tankers now in inventory are to be scrapped by 2005; several interesting ferry replacement and expansion projects are in the pipeline, notably Washington State and Alaska Highway, the most immediate prospects; and OPA 90 and local environmental rules requiring tanker escort will provide construction possibilities for tractor tugs with Z drive or cycloidal propulsion. In all, the IMA report analyzes nine domestic markets.

Navy And Government Market

While the Navy is cutting plans for newbuilds, there are 19 surface combatants to be ordered over the next five years, which will generate revenues over \$8 billion in construction contracts. Also, 12 new sealift ships and five conversions are currently in the pipeline, generating potential revenue of \$3.6 billion over the next several years. Finally, survey and research ships will be significant, as the modernization of NOAA's fleet and construction of

(Continued on page 33)

First ARPA Awards Announced

In late October President Clinton announced the first recipients—companies, universities and other organizations—to be selected for the Technology Reinvestment Project (TRP). From here the Administration negotiates with each of the teams, with the intention of awarding them funds in the near future. Additional team selections are to come over the next few months.

Overall, the initial selections include 41 separate efforts, involving 272 industrial and other organizations. Of the lot, seven of the awarded projects either have direct ramifications on the maritime market or include the participation of maritime suppliers. In seconding the President's announcement, Secretary of Defense Les Aspin said, "The companies and organizations selected today will spearhead the Clinton Administration's efforts to revitalize the U.S. economy and create jobs, and will improve many aspects of life in the U.S. The TRP is an example of how we can use defense dollars in a way that not only insures a strong defense, but that also benefits the U.S.'s commercial position."

The following story highlights seven programs which have been earmarked for matching funding via the TRP.



Project: Commercial Shipbuilding Focused Development Project

Specifics: Bath Iron Works Corp. has proposed a \$13.9 million project (with the federal share to be negotiated) over 24 months to transfer management and production technologies into the partnership to create a globally competitive shipyard. Specific technologies include computer-aided design and process simulation, advanced automated fabrication processes, flexible automation/robotics, real time measurement systems for process control, production planning, material control and estimating, and pollution abatement. These technologies will directly improve production of both commercial vessels and warships for the U.S. Navy. The team will consist of Bath Iron Works, Great American Lines, American Automar, and Kvaerner Masa Marine and Mitsui Engineering and Shipbuilding, which will both transfer proven shipyard technologies into the U.S.



Project: Demonstration and Spin-Off of the Integral Motor/Propeller Propulsion System

Specifics: Westinghouse Electric Corp., Edison Chouest Offshore, the Ben Franklin Technology Center of Western Pennsylvania,

Pennsylvania State University and the U.S. Navy's David Taylor Model Basin have proposed use of an innovative electric propulsion system originally developed for future Navy submarines in commercial applications. The system is known as the Integral Motor/Propeller (IM/P) propulsor. The \$9.8-million effort (with federal share to be negotiated) will include both factory tests and seawater trials over 24 months. The propulsion system is expected to have a significant impact on the U.S. shipbuilding industry by providing advanced propulsor technology to compete against European and Japanese motors. These systems can also be incorporated into future U.S. Navy all-electric ships.



Project: Creating A National Industrial Extension Agent Curriculum

Specifics: A joint project between the National Technology Transfer Center, Pennsylvania State University and Rensselaer Polytechnic Institute will create a curriculum for training extension agents across the U.S. in a consistent, high quality and timely manner. Both basic and advanced curricula will be developed to address all of the needs of the new community of manufacturing extension agents. It will apply to all

service providers, whether they are focused on the Department of Defense or on commercial service providers. The anticipated cost of this effort is approximately \$1.7 million over 24 months (with federal share to be negotiated).



Project: Computer Aided Earth Moving With DP-GPS

Specifics: A team which includes Magnavox Electronic Systems Co., Caterpillar, Spectra-Physics Laserplane and the U.S. Army Corps of Engineers proposes adapting the Global Positioning System (GPS) and laser guidance technology adapted from munitions systems to revolutionize "horizontal construction." Using these technologies to control the position and orientation of the blades of earth-moving and farming equipment during the motion of the vehicle will allow sculpting the earth along any computer-designed path to accuracies of a centimeter in real space without lengthy site surveys and topographic analysis. This will make construction faster and more precise, whether for a roadbed in the U.S. or an emergency landing strip in the Arabian desert. The proposed cost of this effort is \$17.7

(Continued on page 33)

U.S. Yards: Adapting To Compete

by Dan Maniotis, assistant editor

On the morning that the John C. Stennis nuclear aircraft carrier was christened at Newport News Shipbuilding (NNS) in Newport News, Va., NNS's Director of Commercial Marketing Ed Waryas was talking about building commercial ships. Despite deep pride in Navy vessels like the Stennis, U.S. shipbuilders like NNS—who have been extremely active in building Navy ships—face declining Navy work, leaving one option for survival: competing internationally in the commercial shipbuilding market.

To build ships for less, yards are taking certain steps: varying degrees of alliance with foreign yards; cutting costs and improving efficiency. Some are trying a combination of these elements. What just about all the yards are doing, however, is changing to compete in the new world market.

Different Approaches

"We have an advantage in that we are already in that market," said Fred Hallett, marketing director for National Steel and Shipbuilding Co. (NASSCO), San Diego. Although he said NASSCO had received the lion's share of U.S. commercial work in recent years, "our emphasis is to get back to what we did before."

James McIngvale, director of communications for Litton's Ingalls Yard in Pascagoula, Miss., said Ingalls is continuing to develop new markets for their products and new designs for military and commercial sectors, and that Ingalls is "currently working with input from commercial shipowners to create new designs for legislatively-required double-hull tankers in two different capacity configurations."

"Newport News in the past was a very important commercial shipbuilder," said NNS's Mr. Waryas. "But in the last ten or fifteen years the Navy became a very good customer, and there was very little commercial work done at the yard. Now with Navy work declining, the shipyard made a strategic decision to get back into commercial work."

NNS has developed one of the most aggressive approaches, having undergone changes in its very organizational structure. "A number of things needed to be done," Mr. Waryas explained, "and one of them was to bring in key people from the outside who know the commercial business. That's where I fit in." He is among the newcomers, having been with NNS about two months, after recently leaving a position as director of business development for MAN B&W—a position that afforded him formidable experience in



NASSCO's shipbuilding facilities in San Diego.

developing commercial business, and makes him a valuable resource on NNS's new course.

"The whole process started about 18 months ago when we put together our Dedicated Shiprepair Group," Mr. Waryas said. "Since that time we've had fifty ships at the yard, one of the most recent being the Norway. Our intention is to use this shiprepair organization and the people in it as a springboard to com-

mercial newbuildings: they've got experience in commercial repairs, and now we'll just take certain people on the repair side and get them over to the newbuilding side."

World Involvement

Aside from any additions of commercially-savvy people, NNS, NASSCO and other U.S. yards have decided to take some lessons from

(Continued on page 44)

House Passes Maritime Subsidies Bill Overwhelmingly

\$1.2 Billion Earmarked For Maritime Security Fleet; Series Transition Payments To Come For Yards

The House voted in favor of new subsidies to help U.S. shipping lines and shipyards to compete internationally.

The bill (H.R. 2151) is perhaps the most significant piece of maritime legislation since Congress authorized the first maritime subsidies in 1936, and is driven by a fear that U.S.-flag ships will disappear unless Congress takes steps now.

The legislation, which is intended to put the U.S. industry on strong, internationally-competitive footing, was a major, bipartisan effort which was passed by a vote of 347 to 65.

Sponsored by **Gerry E. Studds** (D-MA), chairman, and **Jack Fields** (R-TX), ranking republican member of the Merchant Marine and Fisheries Committee, the bill would ensure that commercial ships fly the U.S. flag and are built in U.S. shipyards.

A 10-year, \$1.2 billion Maritime Security fleet (MSF) program is authorized for militarily useful, U.S.-flag merchant ships, and a new Series Transition Payments (STP) program is created to help U.S. shipyards build vessels that are price competitive on the world market.

"Our votes today will determine a new course for the national defense and the economic security of the U.S.," Mr. Studds said.

He continued by emphasizing that a strong U.S. merchant marine fleet is needed in time of war and peace. "We need one today, and we will need tomorrow, to keep the American market free and independent."

The bipartisan leaders of the Committee also successfully turned back two killer amendments: one by Rep. **Gene Taylor** (D-Miss.), which would have limited the eligible vessels for the MSF program (defeated 64 to 362); another by Rep. **Tim Penny** (D-MN), which would have limited cargo preference (defeated 109 to 309).

"This is our best, if not last, hope of saving the U.S. maritime industry. Without this bipartisan legislation, the U.S. maritime industry will largely disappear, and the most powerful nation on earth...will become totally dependent upon foreign shipping interests," said Mr. Fields.

The **Clinton** Administration agreed to support the bill after its sponsors limited the subsidies for shipping lines to \$1.2 billion over 10 years, starting in fiscal year 1995. That sum will support as many as 70 of the 72 oceangoing vessels now receiving subsidies.

While the bill has passed—with the next action due from the Senate Commerce Subcommittee on Merchant Marine—there are still questions as to how the measure will be funded, as there was no money in President **Clinton's** five year budget plan for the new subsidy program.

Different From Current Plan

The proposed subsidy plan embodied in H.R. 2151 differs from the current operating differential sub-

sidy in two ways. The current plan is based on the difference in labor costs between U.S. vessels and international competitors, where the new MSF program will have fixed payments: \$2.3 million per vessel for the first year; \$2.1 million per vessel, per year thereafter. Also, the new plan allows ships built outside the U.S. to receive subsidies if a U.S. yard could not match the foreign yard's price.

Unrelenting Support

During the House debate of the bill, not one lawmaker spoke against the basics of the bill, as both parties stressed the importance of the maritime industry to the national defense, trade and jobs.

Without congressional action, the U.S. will soon become dependent on ships of other nations," said **Lynn Schenk** (D-San Diego), who co-sponsored the legislation. She said the measure would "assist the U.S. shipbuilding industry to re-enter the commercial market and build vessels for the U.S. and the international markets at competitive prices, and assist the U.S. shipping industry to retain American crews," to enable the domestic shipping industry to compete internationally.

The number of private U.S. flag vessels sailing international waters over the past 28 years has decreased from 620 to 151 ships. During the same period, the number of jobs on large ocean-going U.S.-flag vessels has dropped from about 51,000 to

under 10,000. As of September 1, only one privately-owned vessel of more than 1,000-gt was under construction in the U.S.

Coast Guard Amends Lightering Requirements

Effective October 15, 1993, the U.S. Coast Guard (USCG) amended the applicability sections of its safety and pollution prevention regulations to make it clear that regulations issued under section 311(j) of the Federal Water Pollution Control Act (FWPCA) apply to offshore lightering operations. This rulemaking also establishes what constitutes acceptable evidence of compliance with these requirements. This rule will clarify the applicability of USCG pollution prevention regulations to offshore lightering. In 1984, the USCG promulgated a lightering rule which required both the delivering and receiving vessels engaged in an offshore lightering operation, where the lightering cargo was destined for a port or place subject to the jurisdiction of the U.S., to have a valid Certificate of Inspection (COI) or alternatively, either a Certificate of Compliance or a Tank Vessel Examination Letter (TVEL). The intended effect of this rule was to impose the same regulatory requirements on offshore lightering as those imposed on vessels and facilities engaged in similar operations in the navigable waters of the U.S.

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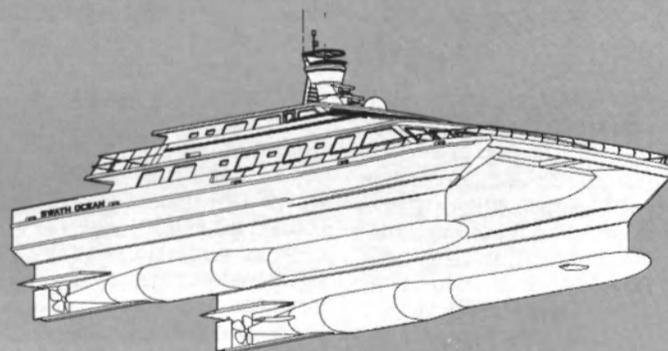
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Maritime Reporter/Engineering News

Five-Year Outlook For U.S. Shipbuilding

(Continued from page 30)

several Navy ocean research ships will provide business opportunities for builders and suppliers.

New Government Programs And Policies

From a hands-off policy toward shipbuilding, the government has shifted to helping U.S. shipyards, and key systems suppliers remain

viable entities. A major objective of the current administration is to attract new technology to the U.S. marine sector. Programs to implement this proactive policy are detailed in the report, and suggestions given as to how to utilize the available assistance.

- Ship Financing Guarantees: the proposal to provide access to federal

financing assistance on ship export sales could be a major boon to U.S. shipbuilders and suppliers, depending on the details of program implementation.

- Shipbuilding Initiative: seed money totalling more than \$200 million is to be thrown at the industry to encourage improvements in shipbuilding and ship design.

- Assistance In Export Sales: the new policy calls for proactive government assistance to U.S. companies selling overseas.

- Eliminating Unnecessary Regu-

lations: actions are planned to reduce regulatory burdens impeding U.S. shipbuilders and systems suppliers.

IMA's new 200-plus page report, report number 7124, lays out the entire marine market available in the U.S. over the next five years. To order the report, contact: IMA Associates, Inc., 600 New Hampshire Ave., N.W., Suite 140, Washington, D.C. 20037; tel: (202) 333-8501; fax: (202) 333-8504.

First Technology Reinvestment Project Awards Announced By President Clinton

(Continued from page 31)

million over 24 months (federal share to be negotiated).

7 Project: Precision Laser Machining
Specifics: TRW Space and Electronics Group has proposed a 24-month, \$33.8-million project (federal share to be negotiated) to develop precision laser machine tools for drilling, cutting, welding and heat-treating a variety of mechanical and composite parts on manufacturing assembly lines.

This technology will enable higher precision and greater tooling speeds than are currently available.

It is expected that this process will replace some chemical machining methods, eliminating hazardous chemical discharge, and permit

the use of lighter weight plastics. The team consists of a broad group of vertically integrated organizations, including Newport News Shipbuilding, Cummins Engine Company and Caterpillar, as well as representatives from the automotive and aerospace industries, and technology development entities.

6 Project: National Assistance Extension Program For Metal Casting
Specifics: The Metal Casting Center at the University of Northern Iowa will expand its current capabilities for metal casting assistance in its local, multi-state region.

The center will link with Manufacturing Technology Centers

(MTCs) and other extension service providers to supply an industry-specific resource.

In addition to helping defense-related and commercial firms improve their competitiveness, it will help increase overall surge capacity in the U.S. casting industry.

The anticipated cost of this effort is approximately \$4.1 million over 24 months (federal share to be negotiated).

7 Project: NEMJET: National Excellence In Materials Joining Education and Training

Specifics: The Ohio State University, in partnership with the Edison Welding Institute and the American Welding Society, and in collaboration with technical institutes, community colleges and small-to-large sized manufacturing companies across the state of Ohio, will establish a regionally-based program in the critical technology area

of materials joining. The program will build upon unique existing programs and facilities and a strong regional network to retrain the manufacturing workforce, primarily displaced defense workers, to meet a diversity of commercial manufacturing industrial needs. Innovative and flexible educational delivery systems, including on-site lectures, interactive video classrooms and teaching factories, will allow seamless access into and accelerated completion of various certificate, bachelor of science and master of science degree-granting programs. The total cost is expected to be approximately \$4.6 million over 36 months (federal share to be negotiated).

For breaking details on ARPA funding, and all legislative news that directly affects the industry, turn to Maritime Reporter's Marine Newsletter, which delivers the latest news three times a month. Call (212) 477-6700 for details.



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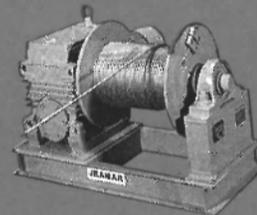


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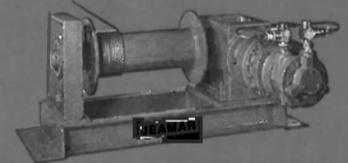


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Gladding-Hearn Delivers New DDEC-Equipped Research Vessel



The research vessel Gulf Challenger.

Gladding-Hearn Shipbuilding, The Duclos Corp., delivered a new research vessel, the Gulf Challenger, powered by DDEC-controlled engines, to the University of New Hampshire.

The vessel's designer, **Roger Long** of Roger Long Marine Architecture, South Portland, Me., said that the new 50-foot, all-aluminum vessel was designed to operate year-round anywhere on the Gulf of Maine and coastal rivers.

The aluminum hull was strengthened for operating in icy waters. The university also opted for the strict Subchapter T(s) U.S. Coast Guard (USCG) certification. This allows the vessel to carry passengers for hire and ensures its additional safety features are properly maintained annually.

The vessel's engine performance is controlled by Detroit Diesel's DDEC fuel-injection system because, like other research boats, it frequently runs at low speeds or idles for long periods. In addition to constantly reporting engine and transmission performance, the electronic operating system allows the engines to idle longer at slow speeds and run cleaner.

Powered by twin Detroit Diesel 8V-92 turbo-charged engines, each rated at 600 bhp, the vessel's 24 knot-plus top speed ensures faster trips within 100 miles of the New England coast. "The DDEC system combined with the vessel's shallow-V planing hull, will improve the engine's overall fuel economy, but especially at low speeds," Mr. Long said.

A Northern Lights generator, inside a sound-proofed enclosure, provides AC power.

For more information on Gladding-Hearn Shipbuilding,

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Gulf Challenger Equipment List

Main engines	Detroit Diesel
Gears	ZF
Propellers	Hall & Stevert
Engine controls	DDEC
Gensets	Northern Lights
Auto pilot/steering system	Raytheon
GPS	Raytheon
Radar	Raytheon
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Compass	Ritchie
Loud hailer	Raytheon

Alcan Crewboat, M/V "Wachwas," Undergoes Extensive Repower And Refit With Cat Engine



(Credit: Alan Haig-Brown)

Alcan Smelters and Chemicals Ltd. has carried out an extensive repowering project on its high speed passenger ferry M/V Wachwas.

Peter S. Hatfield Ltd., Naval Architects and Marine Consultants of Vancouver, B.C., were entrusted with the repower design details and engineering, and following tender evaluation, Allied Shipbuilders Ltd., of North Vancouver, B.C. was contracted to carry out the engine refit project.

The repower option study included three different makes of North American engines, with the final choice being Caterpillar Model 3512 DITA, developing 1,445 bhp at 1,800 rpm (B rating). The two 3512s, including ancillary equipment, were supplied by Finning Power Systems of Vancouver, B.C.

Engineering design and subsequent shipyard work included new engine beds, new exhaust, cooling water and fuel systems piping. New controls, custom engine modifications such as shallow industrial oil pump with scavenge pump, remote mounted jacket water expansion tanks, heat exchangers and air separator units, were addressed and successfully undertaken.

The triple screw 120-foot by 24-foot aluminum Gulf Coast crew boat was built in 1981 by the Swiftship Yard in Louisiana for the Canadian Marine Drilling Co. for operations in the Beaufort Sea.

For more information on Peter S. Hatfield Ltd.,

Circle 40 on Reader Service Card

For more information on Allied Shipbuilders Ltd.,

Circle 41 on Reader Service Card

Spanish Architects License CAD Software To Russian & Belgian Yards

Senermar's, a leading Spanish firm of architects, has signed the first international licenses for the use of the company's new V30 version of Foran, the established CAD/CAE/CAM system for ship design and production.

Licenses have been signed with three overseas shipyards, one in Belgium and two in Russia, bringing the total number of licenses since the system's launch in January this year to ten. Companies that have been licensed include Astilleros Espanoles, Union Naval de Levante and the INI Group.

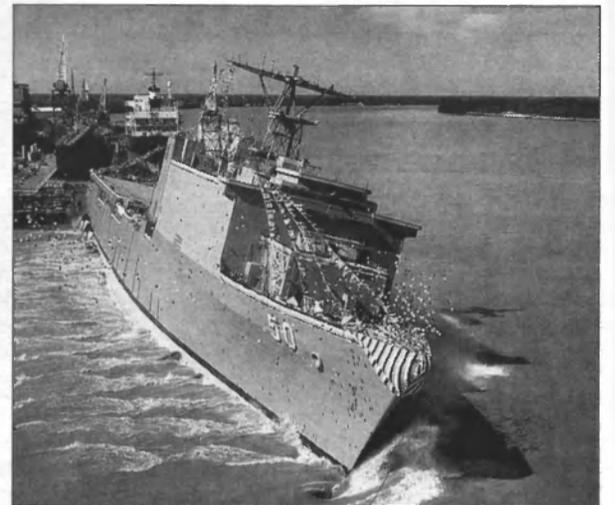
The three new international licenses have been signed with Boelwerf Vlanderen, Belgium; Baltijskij Zavod, St. Petersburg, Russia; and Vyborg Shipyard, Vyborg, Russia.

All three are for the full Foran V30 system, which includes general design, drafting, hull structure, machinery and outfitting subsystems.

For more information on Foran V30 from Senermar's,

Circle 35 on Reader Service Card

Avondale Industries Christens LSD 50 Carter Hall For The Navy



LSD 50 is scheduled for delivery to the Navy in 1995.

LSD 50, the seventh Landing Ship Dock vessel built by Avondale Industries, Inc. for the U.S. Navy, was side-launched and christened the Carter Hall by Avondale Industries, Inc.

LSD 50 is the second LSD (CV), or Cargo Variant, built by Avondale. The 610-foot-long LSD vessels have a beam of 84 feet and a full-load displacement of 16,400 long tons. The vessel's primary mission is to carry, launch and dock the Navy's Landing Craft Air Cushion (LCAC) vessels.

For more information on Avondale Industries,

Circle 29 on Reader Service Card



Ship's sponsor **Mary Elam Howard** breaks the traditional champagne bottle over the bow of LSD 50, officially christening the Avondale Industries-built ship, the Carter Hall, for the U.S. Navy.

PVA Executive Director Scharf Earns ASAE's Highest Honor

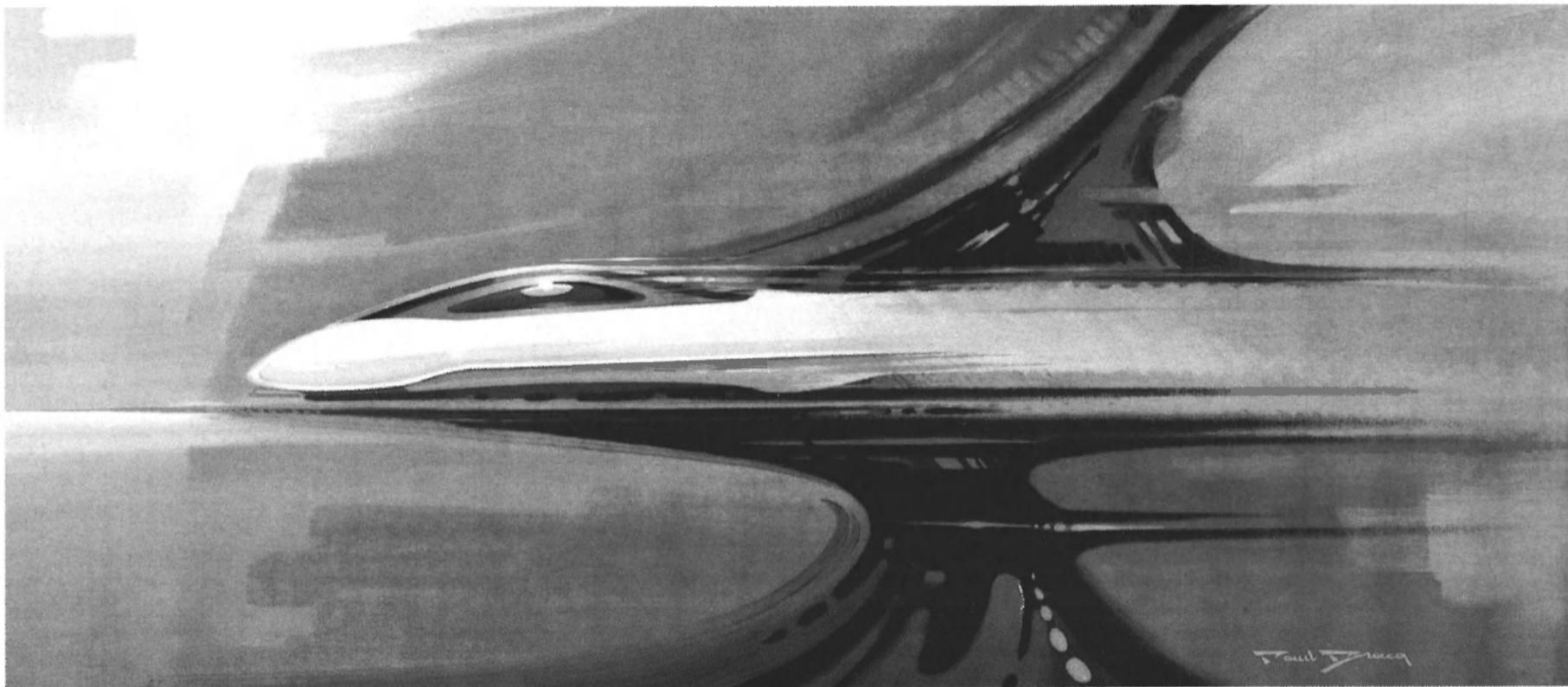
Eric Scharf, executive director of the Passenger Vessel Association (PVA), was one of 59 individuals who earned the Certified Association Executive (CAE) designation from the American Society of Association Executives (ASAE) recently. The CAE designation is the highest honor of professional achievement available from the ASAE.

The American Society of Association Executives, Washington D.C., is an individual membership society made up of more than 20,000 association executives and suppliers.

Maritime Reporter/Engineering News

TED

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4th, 5th AND 6th MARCH 1994
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Circle 287 on Reader Service Card

NAVAL VESSELS UNDER CONSTRUCTION

SHIPYARD				SHIPYARD			
Navy No.	Name	Lt. Displacement Tons	Delivery	Navy No.	Name	Lt. Displacement Tons	Delivery
American Shipbuilding Co., Tampa Shipyards, Inc.				DDG 57	Mitscher	8,300	9/94
T-AO 191	Benjamin Isherwood	15,000	2/94	DDG 59	Russell	8,300	1/95
T-AO 192	Henry Eckford	15,000	10/94	DDG 61	Ramage	8,300	3/95
T-AGOS 23	Impeccable	3,800	5/94	DDG 63	Stethem	8,300	7/95
Avondale Industries				DDG 65	Benfold	8,300	12/95
T-AO 202	Yukon	15,000	12/93	DDG 67	Cole	8,300	5/95
T-AO 204	Rappahannock	15,000	11/95	DDG 69	Milius	8,300	10/96
T-AO 201	Patuxent	15,000	6/95	DDG 71	Ross	8,300	6/97
T-AO 203	Laramie	15,000	4/96	DDG 74	—	8,300	3/98
LSD 49 (CV)	Harpers Ferry	11,894	11/94	LHD 4	Boxer	28,500	10/94
LSD 50 (CV)	Carter Hall	11,894	7/95	LHD 5	Bataan	28,500	5/97
LSD 51 (CV)	Oak Hill	11,894	3/96	LHD 6	Bon Homme Richard	28,500	5/98
MHC 53	Pelican	827	8/94	Intermarine U.S.A.			
MHC 54	Robin	827	3/95	MHC 52	Heron	817	6/94
MHC 56	Kingfisher	827	9/95	MHC 55	Oriole	817	12/94
MHC 57	Cormorant	827	3/96	MHC 58	Blackhawk	817	6/95
WAGB 20	USCGC Healy	11,400	9/97	MHC 59	Falcon	817	12/95
T-AKR 300	—	34,408	9/97	MHC 60	Cardinal	817	6/96
Bath Iron Works				MHC 61	—	817	12/96
DDG 54	Curtis Wilbur	8,300	11/93	MHC 62	—	817	6/97
DDG 56	John S. McCain	8,300	3/94	National Steel And Shipbuilding Co.			
DDG 58	Laboon	8,300	7/94	AOE 6	Supply	19,700	1/94
DDG 60	Paul Hamilton	8,300	12/94	AOE 7	Rainier	19,700	5/94
DDG 62	Fitzgerald	8,300	4/95	AOE 8	Arctic	19,700	2/95
DDG 64	Corney	8,300	9/95	AOE 10	Bridge	19,700	10/97
DDG 66	Gonzalez	8,300	3/96	T-AKR 301	—	36,114	11/97
DDG 68	The Sullivans	8,300	8/96	Newport News Shipbuilding			
DDG 70	Hopper	8,300	1/97	SSN 766	Charlotte	6,000	94
DDG 72	—	8,300	6/97	SSN 767	Hampton	6,000	10/93
DDG 73	—	8,300	11/97	SSN 769	Toledo	6,000	95
DDG 75	—	8,300	4/98	SSN 770	Tucson	6,000	95
DDG 76	—	8,300	9/98	SSN 772	Greenville	6,000	96
General Dynamics Corp., Electric Boat Division				SSN 773	Cheyenne	6,000	96
SSBN 740	Rhode Island	12,500	6/94	CVN 74	John C. Stennis	91,000	95
SSBN 741	Maine	12,500	6/95	CVN 75	United States	91,000	98
SSBN 742	Wyoming	12,500	6/96	Peterson Shipbuilding			
SSBN 743	Louisiana	12,500	6/97	MCM 13	Dexterous	1,262	12/93
SSN 763	Santa Fe	6,000	11/93	MCM 14	Chief	1,262	7/94
SSN 768	Hartford	6,000	11/94	Trinity Industries			
SSN 771	Columbia	6,000	9/95	T-AGS 60	Pathfinder	3,019	10/94
SSN 21	Seawolf	9,150	5/96	T-AGS 61	Sumner	3,019	5/95
SSN 22	Connecticut	9,150	6/98	T-AGS 62	Bowditch	3,019	11/95
Ingalls Shipbuilding Inc.				AGOR 24	Revelle	3,300	5/96
CG 73	Port Royal	9,500	4/94				
DDG 55	Stout	8,300	6/94				

Naval Vessel Conversions And Modernizations

National Steel And Shipbuilding Co.					Newport News Shipbuilding				
Navy No.	Vessel Type	Light Tons	Approx. \$	Delivery	Navy No.	Vessel Type	Light Tons	Approx. \$	Delivery
T-AKR 295	Strategic Sealift	33,163	\$211.6M	12/95	T-AKR-296	Strategic Sealift	33,163	\$212.8M	12/95
T-AKR 297	Strategic Sealift	33,163	\$211.6M	12/95	T-AKR-298	Strategic Sealift	33,163	\$212.8M	12/95
T-AKR 299	Strategic Sealift	33,163	\$211.6M	12/95					

Source: Shipbuilders Council of America

Naval Contract Awards Of 1,000 Light Displacement Tons And Over Placed With U.S. Private Shipyards - 1993

Yard	Navy #	Name	Type	Del.	Tons	Price
Trinity	AGOR 24	Revelle	Ocean Research	5/96	3,300	\$34.7M
NASSCO	AOE 10	Bridge	Fast Combat Sup	10/97	20,732	365.8M
Bath	DDG 73	—	Guided Missile Dest	12/97	6,640	241.3M
Bath	DDG 75	—	Guided Missile Dest	6/98	6,640	241.3M
Bath	DDG 76	—	Guided Missile Dest	9/98	6,640	241.3M
Ingalls	DDG 74	—	Guided Missile Dest	3/98	6,640	40.0M
Intermarine	MHC 61	—	Coastal Mine Hunter	8/96	895	59.2M
Intermarine	MHC 62	—	Coastal Mine Hunter	10/96	895	59.2M
Avondale	WAGB 20	—	USCG Icebreaker	9/97	11,400	232.5M
Avondale	T-AKR 300	—	Strategic Sealift	9/97	34,408	265.2M
NASSCO	T-AKR 301	—	Strategic Sealift	11/97	34,408	269.0M
Avondale	LSD 52 (CV)	—	Landing Dock Ship	1/98	11,894	257.5M

Source: Shipbuilders Council of America

Naval Deliveries Of 1,000 Light Displacement Tons And Over By U.S. Private Shipyards - 1993

Yard	Navy #	Name	Type	Del.	Tons	Price
McDermott	T-AGOS 21	Effective	Ocean Surveillance	1/93	2,486	\$19.8M
NNS	SSN 765	Montpelier	Nuclear Attack Sub	1/93	6,000	257.5M
Avondale	T-AO 765	Tippecanoe	Fleet Oiler	2/93	15,000	106.3M
Bath	CG 70	Lake Erie	Guided Missile Cruiser	3/93	9,500	226.1M
Ingalls	CG 71	Cpe St Grge	Guided Missile Cruiser	4/93	9,500	192.3M
Avondale	T-AGS 45	Waters	Ocean Survey	5/93	7,312	104.4M
Peterson	MCM 11	Gladiator	Mine Countermeasure	6/93	2,262	61.7M
Elec. Boat	SSN 762	Columbus	Attack Sub	6/93	6,000	257.5M
Elec. Boat	SSBN 739	Nebraska	Ballistic Missile Sub	6/93	12,500	615.0M
McDermott	T-AGOS 22	Loyal	Ocean Surveillance	7/93	2,486	19.8M
Ingalls	CG 72	Vella Gulf	Guided Missile Cruiser	7/93	9,500	192.3M
Ingalls	LHD 3	Kearsarge	Amphibious Assault	8/93	28,500	352.7M
Bath	DDG 53	J Pl Jnes	Guided Missile Dest	8/93	8,300	189.9M
Peterson	MCM 12	Ardent	Mine Countermeasure	8/93	1,262	65.9M
Intermarine	MHC 51	Osprey	Coastal Mine Hunter	8/93	817	20.9M
NNS	SSN 767	Hampton	Nuclear Attack Sub	10/93	6,000	257.5M

Source: Shipbuilders Council of America



Outstanding Ships of '93

Outstanding Oceangoing Ships

Delivered In 1993

Selecting the Outstanding Oceangoing Ships of 1993 was a formidable task, considering the high level of quality tonnage produced by yards around the globe. Nonetheless, this year's array of vessels includes some truly outstanding ships, including the 302,200-dwt Siam, the largest double hull VLCC ever, from Daewoo; the Kvaerner Masa-Yard-built Juan J. Sister RoRo/Passenger ferry, the first Spanish ship ever built in Finland; and the MHI-built VLCC Cosmo Delphinus, the first ship of this type equipped with contra-rotating propellers. Overall the list is a tribute to those who built, designed, equipped and bought these outstanding ships.

Yard: Meyer Werft
Vessel: *Silja Europa*
Type : Car/Passenger Ferry

In March the 59,914-grt car/passenger cruise ferry Silja Europa was delivered by Meyer Werft of Germany to a Finnish subsidiary of Papanburger Fahrschiffsreederei GmbH & Co. It is reportedly the largest vessel of its kind at 662 feet long, with a breadth of 105 feet, a draft of about 22.3 feet and 13 decks. The ship has 465 outside and 729 inside cabins for a maximum passenger capacity of 3,013. Luxury accommodations include a swimming pool and a variety of lounges.

Silja Europa's four MAN B&W 6L58/64 engines each provide 7,950 kW at 428 rpm, driving KaMeWa variable pitch, four-blade propeller plants through Renk-Tacke gearboxes. At 85 percent power, the Silja Europa attains 21.5 knots.

Classed by Bureau Veritas, Silja Europa flies the Finnish flag.

For more information on Meyer Werft,

Circle 56 on Reader Service Card

SILJA EUROPA EQUIPMENT LIST

Main engines	MAN B&W
Auxiliary engines	Wartsila Diesel
Electric motors	STN
Generators	A.V. Kaick
Emergency generator	Rolf Janssen
Motor starters	Siemens
Propeller	KaMeWa
Paints	Hempel
Steering gears	Tenford
Gearboxes	Renk-Tacke
Rotor system	Jastram
Fin stabilizers	Sperry Marine
Bow thruster	KaMeWa
Anti-heeling system	Intering
Gyrocompass	Anschutz & Co.
Integrated navigation systems	Atlas Elektronik
Anchor/Mooring winches	Pusnes
Couplings	Vulkan
Stern tube bearing/sealing	Blohm & Voss
Switchboards	Siemens
Bilge separator	Blohm & Voss
Purifier plant	Alfa Laval
Boiler plant	Sunrod International AB
Chilled water units	Sabroe
Lighting fixtures	Aqua Signal
Air compressors	Hattapa
Davits	Schat Davit Co.
Liferafts	Viking A/S
Lifeboats	Fr. Fassmer GmbH & Co.
Fire detection	Salwico
Firefighting	Marioff
Wall panels	Norac
Bow and stern ramps	MacGregor Navire
Hinged car decks	MacGregor-Navire
Shelf doors	MacGregor-Navire
Lifts	MacGregor-Navire

Yard: Juliana (Astilleros Espanoles)
Vessel: *Pascale Knutsen*
Type: Chemical Carrier

Astilleros Espanoles of Spain's Juliana Constructora Gijonesa shipyard delivered the



Hitachi Zosen's chemical carrier 'Arosa.'



IHI's LNG carrier 'Polar Eagle.'



Schichau Seebeckwerft's car/passenger ferry 'Pride of Burgundy.'



Kvaerner Masa-Yards' Ro/Ro passenger ferry 'Juan J. Sister.'



Meyer Werft's car/passenger ferry 'Silja Europa.'

hemical and oil product carrier Pascale Knutsen to owner K/S Knutsen Produkt Tanker III of Jaugesund, Norway.

The vessel is approximately 464 feet long with a breadth of about 75.5 feet and a design draft of about 23 feet, and is classed by Germanischer Lloyd as a +100A5E3 chemical tanker, type 2/oil tanker IW +MCE3 AUT.

One MAN B&W single-acting crosshead main engine with exhaust turbochargers and air coolers drives a cp Liaaen four-blade propeller to a maximum speed of 13.45 knots at 80 percent power.

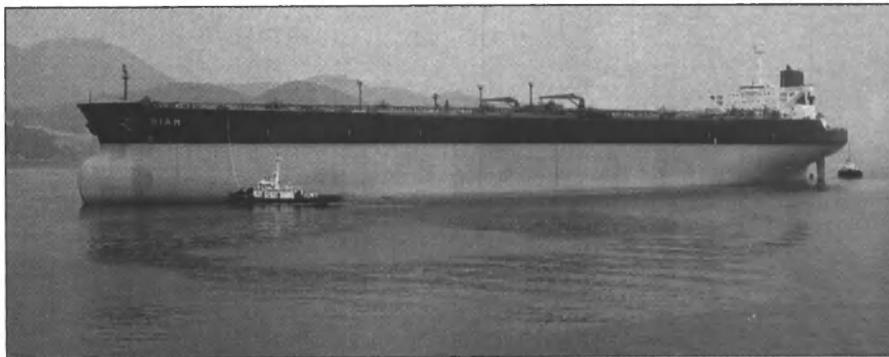
The 14,848-dwt vessel also has one KaMeWa fp 4-blade side thruster and an electrohydraulic steering gear by Hydrapilot.

For more information on Astilleros Espanoles,

Yard: Daewoo
Vessel: Siam
Type: Double-Hull VLCC

On May 15, Daewoo Shipbuilding & Heavy Machinery Ltd. delivered what they say is world's largest double-hull VLCC as well as the first double-hull VLCC built by a Korean yard, the Siam, to World-Wide Shipping, Hong Kong.

The third of a six-VLCC contract, the 302,300-dwt vessel is designed



Daewoo's double-hull VLCC "Siam."

Circle 48 on Reader Service Card

**PASCALE KNUTSEN
EQUIPMENT LIST**

- Main engine MAN B&W
- Auxiliary engines Bergen Diesel
- Propeller Liaaen
- Side thruster KaMeWa
- Steering gear Hydrapilot
- Rudder Becker
- Generators Alconza
- Ballast pumps Itur Ilsi
- Compass Jupiter
- Gyrocompass Sperry
- Autopilot Sperry
- Echosounder JRC
- Satellite communications Furuno
- Radios Crame, Sailor

Yard: Ishikawajima-Harima Heavy Industries
Vessel: Polar Eagle
Type: LNG Carrier

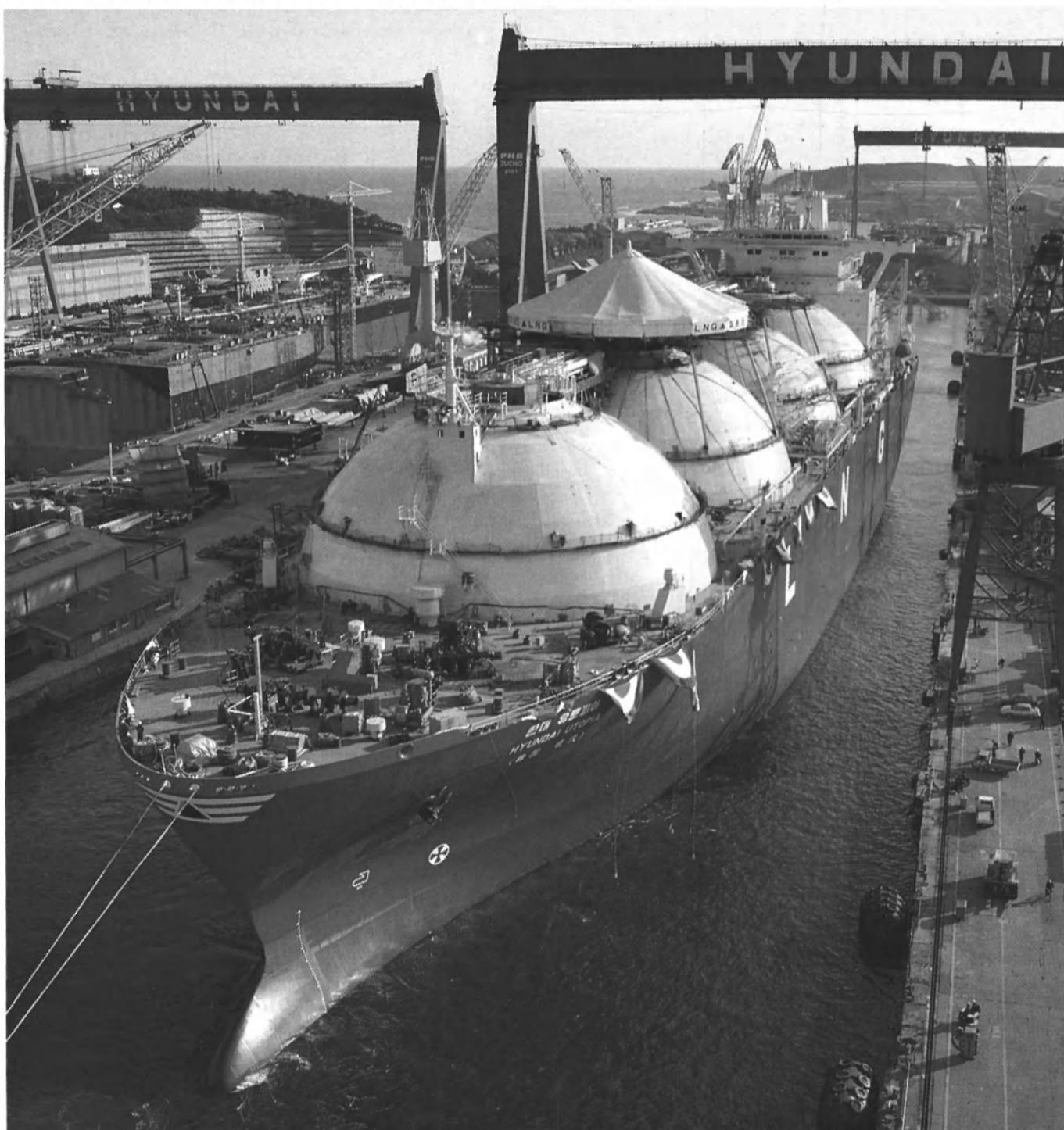
Delivered to owner Phillips/Marathon on June 4, the 48,817-dwt Liquid Natural Gas carrier Polar Eagle is approximately 784 feet long, 131 feet wide and 88 feet deep, yet it can reach 18.5 knots. Classed by ABS, it was built at IHI's Aichi yard and is the first vessel equipped with IHI's SPB system (Self-supporting Prismatic IMO type B) independent tanks, which are incorporated into the hull, allowing a flat upper deck.

The hold and tank spaces of the Polar Eagle have been configured for easy inspection, and its flat upper deck facilitates maintenance of deck pipings and equipment without stagings.

The vessel also has special features that make it especially fit for Alaska trade: underdeck passages for easy tank dome access, mooring winch areas, a flat accommodation wall and lower piping arrangement on deck to combat freezing.

For more information on Ishikawajima-Harima Heavy Industries,

Circle 54 on Reader Service Card



WE BUILD A BETTER TOMORROW



Circle 254 on Reader Service Card

Our confidence in shipbuilding is rooted in the knowledge that we have the latest technology. And the excellence of technology is just what we perform for building a better tomorrow.





Samsung Heavy Industries' FPSO tanker 'Griffin Venture.'

to comply with U.S. Coast Guard double-hull regulations for worldwide transportation of crude oil, and is registered with Det Norske Veritas under the Panamanian flag.

Main propulsion is provided by one KHIC B&W 7S80MC driving a Lips four-blade fp propeller, giving the vessel a loaded service speed of 15.7 knots.

A cargo handling system covering pump control, opening and closing of valves, tank level gauging

and the inert gas system is remote controlled and monitored from a centralized cargo control room.

For more information on Daewoo

Circle 49 on Reader Service Card

**SIAM
EQUIPMENT LIST**

Main engines	B&W
Generator engine	B&W Ssangyong
Generator	Heeco
Propeller	Lips
Steering gear	Tongmyung-Khi
Pumps	Shinko
Bridge control	Norcontrol
Fire detection	Salwico
Fire extinguishing	Unitor
Radar	Krupp Atlas
Autopilot	Tokimec
Position navigator	Decca
Deck machinery	DW-Norwinch



CONGRATULATIONS!!

As suppliers of the Salwico CS3000 Fire Alarm System onboard M/S Silja Europa, we congratulate Silja Lines for winning

Outstanding Ocean Going Ships Award



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Circle 263 on Reader Service Card

ZODIAC Hurricane rigid inflatable boats are tender and tough in all the right places. The wraparound inflatable collar is both a stabilizer that assures smoother handling in even the roughest seas, and a fender that cushions against hull damage during boarding operations.

SOFT SELL.



HARD SELL.

ZODIAC Hurricane's computer designed, commercial-grade hull is reinforced in all the right places. Its computer designed lifting stakes generate high lift at low speed. This deep "V" design provides excellent high speed maneuverability and unsurpassed sea-keeping ability. All the reasons why ZODIAC Hurricane is the choice of professional users worldwide.



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Stevensville, MD 21666
(410) 643-4141 ext. 3009



Circle 273 on Reader Service Card

Yard: Finnyards
Vessel: Fennica
Type: Icebreaker

The 380.6-foot multipurpose icebreaker Fennica was delivered to the national Board of Navigation (NBN) at the Rauma, Finland shipyard of Finnyards, Ltd.

More than 90 percent of the vessel was built using Finnish components and equipment, and she will sail under that country's flag.

The sophisticated Fennica was built in just 17 months with an 85.3-foot beam and a draft of between 23 and 27.6 feet.

She is the first vessel to receive Det Norske Veritas's rating of Icebreaker Polar 10, and is capable of clearing 2.6-foot ice at a continuous speed of 8 knots and of breaking 5.9-foot ice by ramming.

The diesel electric cyclo-converter propulsion system is based on two six-MW and two 4.5-MW Wartsila Vasa 32 engines, each driving a 6.3-kV ABB Stromberg generator for a top speed of 16 knots and a bollard pull of 200 tons.

For more information on Finnyards,

Circle 50 on Reader Service Card

**FENNICA
EQUIPMENT LIST**

Main engines	Wartsila
Cyclo-converters	ABB-Stromberg
Generators	ABB-Stromberg
Propulsion units	Aquamaster-Rauma
Bowthrusters	Brunvoll
DPS	Simrad
Harbor generator	Wartsila
Emergency generator	Caterpillar
Stabilizing system	Intering
Deck/pilot cranes	MacGregor
Helicopter/crew elevators	MacGregor
Refrigeration plant	Sabroe
Anchors, chains	G.J. Wortelboer
Telephone/PA system	Telest Marine
Radars, radio station	Selesmar
ECDIS nav system	Robertson
Integrated nav system	Selesmar
SSB MF/HF radio	Skanti
VHF radio	Aero
Lifeboats	Waterman



M/S Silja Europa

M/S Nathalie Sif

M/S Pascale Knutsen

The Silja Europa is equipped with a KaMeWa propulsion system guaranteeing an extremely high standard of both manoeuvrability and comfort. The system includes two main propellers with highskew, controllable pitch blades, tunnel thrusters and a joystick control system for simultaneous single-lever control of the rudders and all propellers.

Propulsion by KaMeWa



Whatever your priorities are - fuel economy, speed manoeuvrability or comfort - you can always expect more from KaMeWa.

EXCELLENCE IN PROPULSION



KaMeWa AB, P.O. Box 1010, S-681 29 Kristinehamn, Sweden.
Phone: +46 550 84000, after office hours +46 10 2816566.
Fax: +46 550 18190. Telex: 660 50 kamewa s.

Circle 258 on Reader Service Card

OUTSTANDING OCEANGOING SHIPS OF 1993

Yard: Hanjin Heavy Industries
Vessel: Goliath
Type: Cement Carrier

The cement carrier Goliath, approximately 440 feet long and 77 feet wide with a full load draft of about 27 feet, was delivered to Goliath Portland Cement Co., Ltd. of Australia.

The vessel will be operated under the Australian flag and has been classified by Lloyd's Register.

Propulsion speeds of up to 16.5 knots are provided by a single Korea Heavy Industries-manufactured, Sulzer-designed 5RTA52 two-stroke, single-acting, airless-injection crosshead turbocharged engine with a maximum power of 6,400 kW at 120 rpm and a service power of 5,760 kW at 116 rpm. Cement loading, distribution and discharging is accomplished via a completely enclosed pneumatic system from Ibau Hamburg.

The vessel can accommodate two types of cement, and can be loaded at a nominal rate of 1,200 tons/hour through four lines.

For more information on Hanjin Heavy Industries,

Circle 51 on Reader Service Card

GOLIATH EQUIPMENT LIST

Main engine Sulzer
 Propellers Navalips
 Generators B&W Ssangyong
 Auxiliary generator Hyundai
 Cargo pumps Ibau Hamburg
 Ballast control Norcontrol
 Bow thruster Ulstein
 Bridge control Norcontrol
 Radar Norcontrol
 Navigation Anschutz, JRC, Sperry,
 Hamworthy-Industriahar
 Satellite navigation Sailor
 Fire detection Salwico
 Fire extinguishing Nam Yang
 Pipe antifouling Cathelco
 Deck machinery ... Hagglunds, Hydraulic-Brattvaag

Yard: Schichau Seebeckwerft AG
Vessel: Pride Of Burgundy
Type: Car/Passenger Ferry

The combi-ferry Pride of Burgundy was delivered from Schichau Seebeckwerft of Bremerhaven, Germany to P&O European Ferries in March. At 589.5 feet long, the vessel has a breadth of 91 feet, a 20.5-foot draft and a 5,875-dwt capacity. The ship was begun as a Ro/Ro ferry but converted in mid-construction due to the demand for the combi-ferry vessel type. The Pride of Burgundy can accommodate 1,320 passengers and 80 crew. It has three restaurants, two bars, a shopping arcade, a video cinema and a children's playground.

Four Sulzer 8ZA40S four-stroke engines each generate 5,280 kW at 510 rpm, giving the Pride of Burgundy a speed of about 21 knots.

For more information on Schichau Seebeckwerft,

Circle 59 on Reader Service Card

PRIDE OF BURGUNDY EQUIPMENT LIST

Main engines Sulzer
 Generators Sulzer/Siemens
 Navigation Decca-Racal

Yard: Hitachi Zosen
Vessel: Arosa
Type: Double-Hull VLCC

The Arosa, delivered by Hitachi

Zosen to Arosa Maritime, Inc. in February, is reportedly the first double-hull VLCC built in Japan. The 291,381-dwt vessel was built at Hitachi Zosen's Ariake Works, Kumamoto Pref. The vessel is approximately 1,077 feet long, with a breadth of 190 feet and a fully-loaded draft of about 71 feet. Its Hitachi Zosen 7S80MC main engine drove the vessel to a maximum trial speed of 16.345 knots. In addition to the distinction of being the

first double-hull VLCC from Japan, its other special features include a minimum-resistance hull with a bulbous bow, a superstream propeller duct for enhanced propulsive efficiency, enhanced scantlings for additional hull strength and corrosion margin, and a zinc silicate paint system on deck for additional corrosion protection. For more information on Hitachi Zosen,

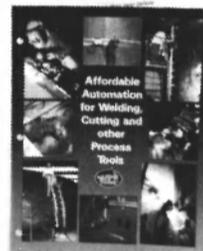
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**AROSA
EQUIPMENT LIST**

Main engine	HZ B&W
Propeller	Nakashima
Generator engine	Daihatsu Diesel
Generator	Nishishiba Electric
Steering gears	Kawasaki Heavy Industries
Shafting	Kobe Steel
Coatings	Chugoku Marine Paints
Radar	JRC
Autopilot	Tokyo Keiki
Cargo pump	Shinko Industries
Deck machinery	Nippon Pusnes

Yard: Hyundai Heavy Industries
Vessel: *Nathalie Sif*
Type: Chemical Carrier

Second in a series of three sisterships for owner Knud I. Larsen Shipping Co. of Denmark, the 9,200-dwt, 382.5-foot-long chemical carrier *Nathalie Sif* was christened by Princess Benedikte of Denmark.

The vessel has an approximate molded breadth of 62 feet and draft

of 25.5 feet. It is classed by Det Norske Veritas and operates under the Danish flag.

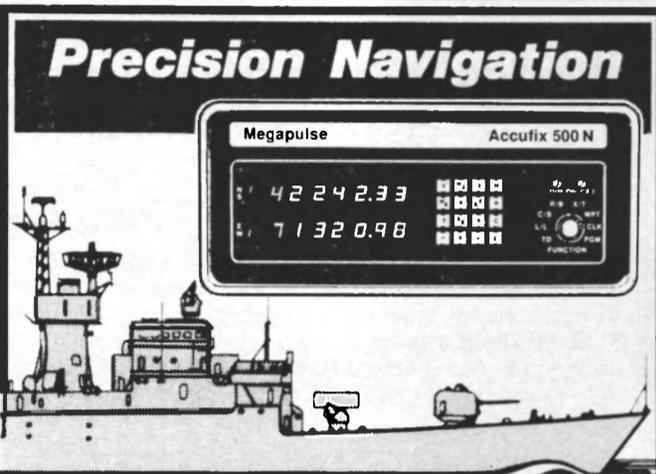
Designed to enable one person to navigate at all times in ocean and coastal waters, the vessel can carry IMO II and III products in ten fully-segregated, coated tanks for up to ten different cargoes. Its double hull complies with Marpol 73/78 Annex 1 Rule 13F.

The MaK 6M 552 C main engine has an output of 4,050 kW at 500

rpm, and is equipped with an exhaust gas turbocharger, driving a NiAl-bronze cp propeller to a service speed of 14.1 knots at 90 per cent power with 25 percent sea margin at design full load condition.

For more information on Hyundai Heavy Industries,

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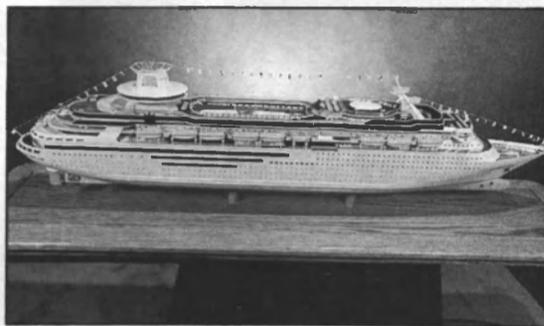
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**NATHALIE SIF
EQUIPMENT LIST**

Main engine	Krupp-MaK
Auxiliary engines	Krupp-MaK
Main generator	Kangrim-Aalborg
Shaft generator	A. Van Kaick
Reduction gears	Renk-Tacke
Propeller	KaMeWa
Thruster	KaMeWa
Steering gear	Tenford
Pumps	Svanehoj, Toftejorg
Compass	Anschutz
Autopilot	Anschutz
Echosounder	Honeywell
Doppler speed log	Sperry
Radars	Tokimec
GPS	Magnavox
Loran-C	Raytheon
Satellite communications	Sailor
GMDSS	Sailor
Bridge control	Norcontrol

Yard: Kvaerner Masa-Yards
Vessel: *Juan J. Sister*
Type: Ro/Ro Passenger Ferry

Delivered in May to the Spanish government-owned Compania Transmediterranea SA from Kvaerner Masa's Turku New shipyard, the *Juan J. Sister* is the first Spanish ship built in Finland, specifically designed for operation between Spain and the Canary Islands. At 85.3 feet wide, the vessel has a draft of 19.7 feet. It will carry 400 passengers in 139 cabins, with room for 150 more on deck for shorter trips. At almost 496 feet long and drawing 19.7 feet, *Juan J. Sister* achieves maneuverability via two flap rudders and two bow thrusters. Its four Wartsila Vasa 8R32E diesel engines generate 3,150 kW each at 765 rpm, driving the 5,500-dwt vessel to a speed of 18 knots. The *Juan J. Sister* flies the Spanish flag and is classed by Bureau Veritas.

For more information on Kvaerner Masa-Yards,

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**JUAN J. SISTER
EQUIPMENT LIST**

Main engines	Wartsila Vasa
Auxiliary engines	Wartsila Vasa
Emergency generator	MAN
Reduction gear	Lohmann & Stolterfoht
Propeller	Lips
Side thrusters	Lips
Steering gear	Tenford
Shafts	Lips
Shaft bearings	Waukesha-Lips
Pumps	Kvaerner-Eureka, Allweiler, Leistritz
Davits	Schat Davit Co.
Gyrocompass	Sperry
Autopilot	Sperry
Radar	Sperry
Echosounder	Simrad
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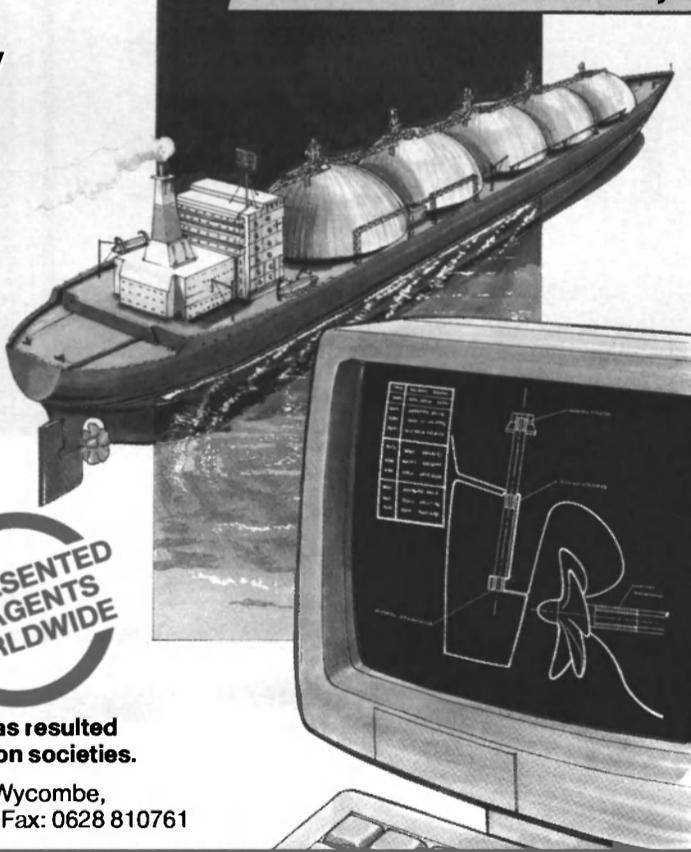


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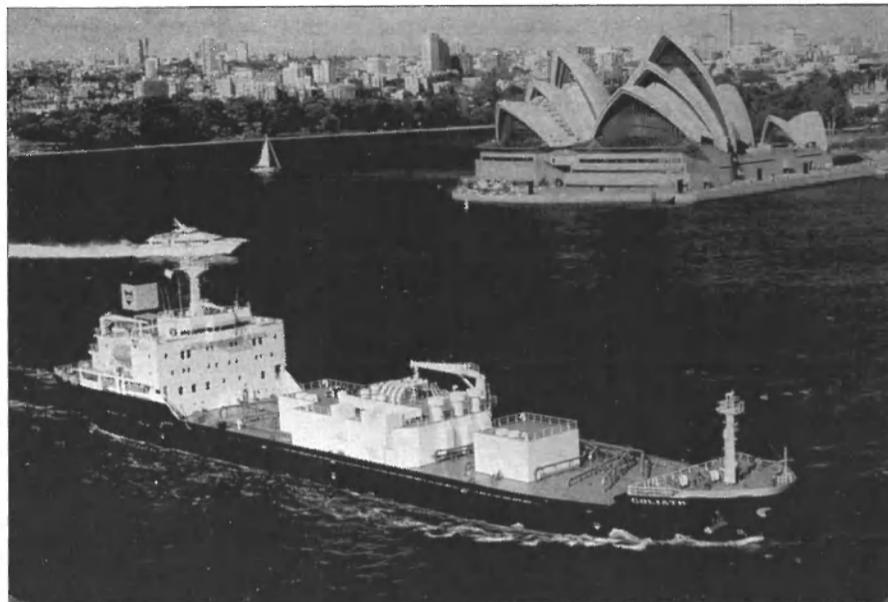
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Outstanding Oceangoing Ships of 1993

Name	Type	Yard	Engine
Arosa	Double-Hull VLCC	Hitachi Zosen	HZ B&W
Cosmo Delphinus	VLCC	Mitsubishi	n/a
Fennica	Icebreaker	Finnyards	Wartsila Vasa
Goliath	Cement Carrier	Hanjin Heavy	Sulzer
Griffin Venture	FPSO Tanker	Samsung	n/a
Juan J. Sister	Ro/Ro Passenger Ferry	Kvaerner Masa-Yard	Wartsila Vasa
Nathalie Sif	Chemical Carrier	Hyundai Heavy Industries	Krupp-MaK
Pascale Knutsen	Chemical Carrier	Astilleros Espanoles	MAN B&W
Polar Eagle	LNG Carrier	IHI	n/a
Pride of Burgundy	Car/Passenger Ferry	Schichau Seebeckwerft	Sulzer
Siam	Double-Hull VLCC	Daewoo Industries	B&W
Silja Europa	Car/Passenger Ferry	Meyer Werft	MAN B&W



Hanjin Heavy Industries' cement carrier "Goliath."



Mitsubishi Heavy Industries' VLCC "Cosmo Delphinus."

Yard: Mitsubishi
Vessel: Cosmo Delphinus
Type: VLCC

Mitsubishi Heavy Industries (MHI) delivered the 1,056-foot, 146,527-dwt Cosmo Delphinus, the first VLCC with a contra-rotating propeller system (CRP), from its Nagasaki Works to owner Shinwa Kaiun Kaisha, Ltd. this March. The Cosmo Delphinus has a beam of 190 feet and a draft of 64 feet.

The CRP system's two coaxial propellers rotate in opposite directions, allowing the rear propeller to

use swirl generated by the fore propeller, saving a reported 15 percent power. The Cosmo Delphinus is also the first ship to be equipped with the Super Advanced Ship Operation Support system (Super ASOS), an integrated system that monitors engines, handles cargo, and prevents collisions with its navigational features. Both Super ASOS and CRP features were developed by MHI.

For more information on Mitsubishi,

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(Continued on page 44)

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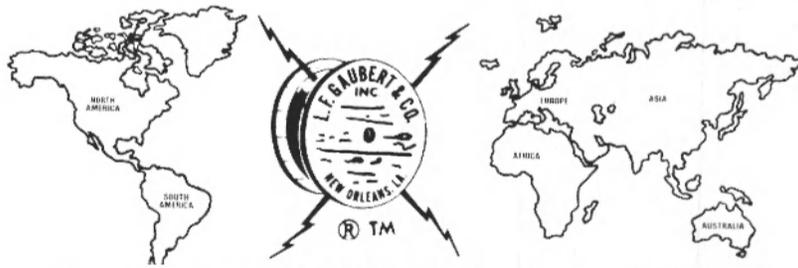
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Hyundai Heavy Industries' chemical carrier 'Nathalie Sif.'

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SSB	Sailor	Autopilot	Anschutz
Radar	Kelvin Hughes	Cargo Pump	Kvaerner Eureka

Yard: Samsung Heavy Industries
Vessel: Griffin Venture
Type: FPSO Tanker

The Griffin Venture, a 105,000-dwt FPSO (Floating, Production, Storage and Offloading) tanker, was delivered to BHP Petroleum, Australia, by Samsung Heavy Industries (SHI) in October. Classed by Lloyd's, the Griffin Venture will fly the Australian flag and operate near that country's Griffin Field. The tanker is 797 feet long, with a 137-foot breadth and a draft of nearly 48 feet, and is built to comply with IMO Regulation 13F regarding double skin hulls. The Griffin Venture's hull was designed to harmonize with the ship's rotatable azimuth thrusters. Its two engines each generate 2,500 kW to propel the ship at a speed of 8.1 knots. For more information on Samsung Heavy Industries,

Circle 58 on Reader Service Card

U.S. Yards Change To Compete
(Continued from page 31)

the foreign yards they must compete with. This is also attractive to the foreign businesses, such as those in Japan for whom American labor is cheaper and costs not as unbalanced as they once were, thanks to a swelling yen. "We've had Europeans and Japanese in our yard since 1979," NASSCO's Mr. Hallett stated. "We're behind in doing long production runs. Methodologies and technologies exist that are superior to those in the U.S.," he said, noting that the containership Madison built at NASSCO was a European design.

"Let's face it," said Mr. Waryas, "there are people around the world who've been building commercial ships for years, and there's no sense reinventing the wheel." NNS's recent joint proposal with Ishikawajima-Harima Heavy Industries (IHI) and Sumitomo Heavy Industries (SHI) of Japan, and Ficantieri of Italy, to build eight LNG carriers for the Italian gas utility Snam, gained a place for NNS at the cutting edge of commercial ship design with access to IHI's SPB (Self-supporting Prismatic IMO type-B) design. Considered the most advanced tanker design in the world, it was first incorporated into IHI's 1993 delivery, the Polar Eagle. And for NNS, this place was obtained without a lot of costly R&D.

High Efficiency, Low Costs

Performance improvement is indeed a catchphrase among U.S. shipyards these days. As of November 1993, NNS is ISO 9000-certified, a factor NNS hopes will enhance its commercial position — but most of its change is coming from within. "We separated businesses along product lines," Mr. Waryas said, "so you have the Navy business, then the commercial business. We have a completely different setup for the commercial side. What we

look at is driving down costs: we identify the costs associated with commercial shipbuilding, and the idea is to get our cost structure such that we can compete not only domestically, but internationally."

NNS is trying to ensure that it uses its resources most productively. Ken Clarke, NNS's Manager of Commercial Ship Marketing, says a number of programs have been instituted to minimize costs. "One program is the Cost of Quality program, where we analyze the cost of our internal and external rework. By doing this we can target areas for improvement that will give us the greatest return on our efforts."

"Another result of implementing this program," Mr. Waryas added, "is reflected in how we review vendor bids. When we received bids, in most cases it was traditional to take the low bid. But in the long run, that might not be the best action, because of downstream problems which translate into extra costs. It might be better to take a slightly higher bid from a vendor with a proven quality record or who we have cooperated with before." NNS has created far-reaching, pro-active programs to cut costs in many forms, from minimizing the consequences of subcontractor underbidding to improving employee involvement. The program also has a component designed to send a message of empowerment to NNS's employees. "Go do something about it," Mr. Clarke encapsulates the message. "Don't wait for someone to tell you, 'Go fix this,' come up with a solution and implement it." Problems not identified and dealt with immediately can mean a complete rework if detected at an advanced stage of construction.

NASSCO's Mr. Hallett also identified costs as a problem. American labor costs are competitive with foreign yards, yet we've had difficulty producing commercial ships for prices nearly as low. "I perceive that the U.S. is the world leader in military technology, but we are not the world leader in driving down costs," Mr. Hallett said.

The Outlook

"You're not going to buy a race car for the same price as a Chevy," said Mr. Hallett of the price differential between U.S. and foreign commercial ships. To use this analogy, the challenge U.S. shipyards face today is tantamount to race car builders learning how to build Chevys cost-effectively: there are different methods and less of a flexible budget to work with. Then there is the problem of convincing shipowners that U.S. yards are once again viable commercial shipbuilders. Even though NASSCO has learned from contact with foreign yards, Mr. Hallett said it and other U.S. yards need orders on which to put new techniques to concrete use, to give their workers hands-on experience building modern commercial ships.

When he spoke of NNS in particular, Mr. Waryas could have been speaking of U.S. shipbuilding in general: "We want to send a clear message that says we're back in the commercial business."

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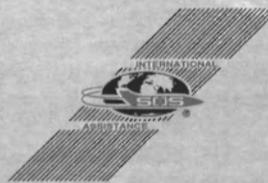
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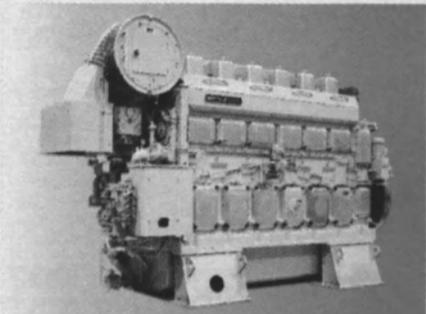
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Permea Maritime Protection Wins Order For World's Largest Membrane Nitrogen System

A Norwegian manufacturer of membrane nitrogen systems, combustion inert gas systems and hydrogen recovery systems, Permea Maritime Protection, a division of Air Products A/S, has received a contract to supply what is reportedly the world's largest nitrogen generation system using membranes. The system is designed to generate 1,800 Sm³/h of nitrogen with a maximum oxygen content of 0.8 percent and will be installed in the Troll Onshore Gas Treatment and Recompression Plant, located at Kollsnes in Oygarden, 50 km northwest of Bergen, Norway. The contract was awarded by A/S Norske Shell, development operator for Troll Project, phase I.

"This contract is very promising for the forthcoming use of membranes in large nitrogen systems," says Arne Tag, offshore sales manager of Permea Maritime Protection. "After thorough evaluation the client finds today's membranes to be technically sound."

The Troll membrane system will be manufactured to the Troll Project standards in Kristiansand, Norway, and is scheduled for delivery in September next year.

Permea Maritime Protection has built more than 30 nitrogen systems to offshore standards and some 130 for shipboard use. The company's latest offshore delivery was the nitrogen system for the Troll Olje platform.

For more information on Permea Maritime Protection,

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Cellular Phone Manufacturer Works With Inmarsat To Produce Global Hand-Held Communicator

A model of a future Inmarsat-P hand-held satellite phone - smaller than any of today's cellular phones, but usable anywhere on Earth - was presented to Inmarsat director general Olof Lundberg by Kurt Hellstrom, president of Ericsson Radio Systems.

Ericsson developed the model for Inmarsat, which is planning to introduce the Inmarsat-P global, digital hand-held phone service using an advanced satellite system in the 1998-2000 time frame. Inmarsat is the London-based international mobile communications satellite operator.

The model Inmarsat-P was presented by Ericsson at the CNIT in La Defense, Paris, on the closing day of the Second Inmarsat International Conference and Exhibition on Mobile Satellite Communications.

For more information on Inmarsat,

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December, 1993

Norwegian Telecom Offers Inmarsat M - Lower-Cost Telephone For Smaller Vessels

This month, Norwegian Telecom will launch a new worldwide satellite-based telephone service, Inmarsat M, which the company claims will cost less than Inmarsat A.

Inmarsat M can transfer data and fax as well as voice, but is particularly useful for telephone service. Although suited for all maritime communication, Inmarsat M could become the preferred choice for smaller craft, including the fishing fleet, currently not using satellite communication because of the costs.

Inmarsat M covers most of the globe, including the Indian Ocean. The Atlantic Ocean is served by Brit-

ish Telecom, and by the interaction of Singapore Telecom, full coverage of the Pacific Ocean will be reached by mid-1994.

For more information on Inmarsat M from Norwegian Telecom,

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Above: 322 ft. Casino Vessel (under construction).

Top left: 189 ft. Paddlewheel Excursion Vessel.

Bottom left: 184 ft. Excursion Vessel.

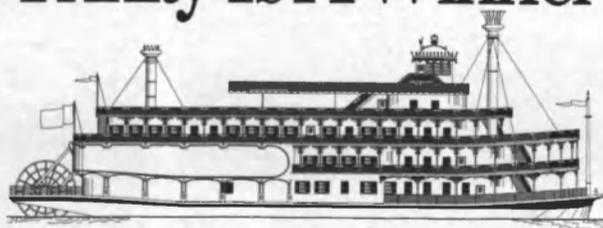
Top right: 200 ft. Trinity Space Ship.

Bottom Right: 140 ft. Excursion Vessel.

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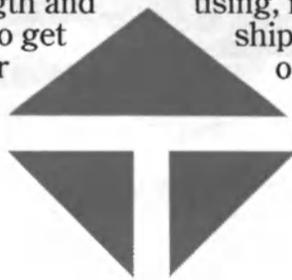
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245 ft. Casino Vessel (two under construction).

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WORLD SHIPBUILDING ORDERBOOK

The following are the responses received from a limited survey of new construction in shipyards around the world, compiled by the editors of *Maritime Reporter & Engineering News*. The publisher is not responsible for errors or omissions.

SHIPYARD						SHIPYARD					
Vessel Name/Type	GT	Dimensions (m)	Engines	Owner	Delivery	Vessel Name/Type	GT	Dimensions (m)	Engines	Owner	Delivery
Aarhus Flydedok, Denmark						Kvaerner Masa-Yards Inc., Turku New Shipyard					
Astrid Terkol/Chemical Tanker	3,206	88 x 15 x 8	n/a	Terkol	6/93	Containership	51,000	273 x 32 x 21	DU-Sulzer	P&O	8/94
NB No. 204/Chemical Tanker	3,206	88 x 15 x 8	n/a	Terkol	10/93	Containership	61,000	283 x 37 x 22	DU-Sulzer	Silvanus Shiphold.	12/94
NB No. 208/Cargo Ship	4,600	94 x 19 x 9	n/a	Elite	3/94	Containership	61,000	283 x 37 x 22	DU-Sulzer	Mol Euro-Orient	1/95
NB No. 209/Cargo Ship	4,600	94 x 19 x 9	n/a	Elite	6/94	Containership	61,000	283 x 37 x 22	DU-Sulzer	Silvanus Shiphold.	3/95
NB No. 210/Cargo Ship	4,600	94 x 19 x 9	n/a	Elite	9/94	Bulk Carrier	38,400	215 x 32 x 19	DU-Sulzer	Tana Ship Co.	1995
NB No. 211/Cargo Ship	4,600	94 x 19 x 9	n/a	Elite	11/94	Containership	61,000	283 x 37 x 22	DU-Sulzer	Mol Euro-Orient	5/95
Aukra Industrier A/S, Norway						Kvaerner Masa-Yards Inc., Helsinki New Shipyard					
Antarctic I	1,245	50 x 12 x 6	Caterpillar	American Seafood	7/93	Cable Layer	11,000	127 x 22 x 6	n/a	Intl. Cableship PTE	fall 94
Belgian Shipbuilders Corporation N/V, Belgium						Kvaerner Masa-Yards Inc., Helsinki New Shipyard					
Trailing Suction Hopper Dredger	3,500	110 x 22 x 8	n/a	Jan de Nul	1994	Cable Layer	11,000	127 x 22 x 6	n/a	"	1997
(2) Mooring Vessels	370	33 x 11 x 4	n/a	Saudi Aramco	1994-95	Cruise Liner	43,500	237 x 30	n/a	NYK Line	spring 95
(4) Docking Tugs	735	41 x 13 x 7	n/a	Saudi Aramco	1994-95	(4) LNG Carriers	115,800	285 x 48 x 11	n/a	Abu Dhabi	1995 to
Boelwerf Vlaanderen, Belgium						Malaysian Shipyard & Engineering, Malaysia					
Navigator/	9,250	n/a	Wartsila	Friary Subsea	10/94	Fascination/Cruise Liner	70,300	260 x 32 x 8	n/a	Carnival Cruise Line	6/94
Cable Laying/Repair				Surveyor		Imagination/Cruise Liner	70,300	260 x 32 x 8	n/a	"	6/95
Crystal Amethyst/Chem Tanker	5,450	n/a	Sulzer	Hol-Chem I	12/93	Meyer Werft, Germany					
Crystal Emerald/Chem Tanker	5,450	n/a	Sulzer	Hol-Chem II	12/93	S. 633/Passenger Ship	6,000	100 x 18	n/a	Indonesia	1994
Crystal Pearl/Chem Tanker	5,450	n/a	Sulzer	Hol-Chem III	12/93	S. 634/Passenger Ship	6,000	100 x 18	n/a	Indonesia	1994
Crystal Pilgrim/Reefer Vessel	7,743	n/a	MAN B&W	Ahlers Lines N.V.	1994	S. 635/Passenger Ship	6,000	100 x 18	n/a	Indonesia	1994
Crystal Pioneer/Reefer Vessel	7,743	n/a	MAN B&W	Ahlers Lines N.V.	1994	Oriana/Cruise Vessel	67,000	260 x 32	n/a	P&O	1995
LPG/Ammonia/VCM Tanker	9,900	n/a	MAN B&W	Hol-Chem VI	12/94	S. 637/Cruise Vessel	70,000	243 x 32	n/a	Celebrity Cruises	1995
LPG Tanker	23,831	n/a	MAN B&W	Exmar N.V.	9/95	S. 638/Cruise Vessel	70,000	243 x 32	n/a	Celebrity Cruises	1996
LPG Tanker	23,831	n/a	MAN B&W	Exmar N.V.	12/95	S. 639 (option)/Cruise Vessel	70,000	243 x 32	n/a	Celebrity Cruises	1997
Brattvaag Skipsverft A/S, Norway						MWB Motorenwerk, Germany					
(2) Car Carriers	9,700	120 x 19 x 18	Wartsila	United European Car Carriers A/S	7/94 & 10/94	Oil Recovery Catamaran	n/a	39 x 13 x 3	n/a	Hansestadt Bremisches	6/94
Hitachi Zosen, Japan						NKK Corporation, TSU Shipyard, Japan					
Transworld/Bulk Carrier	n/a	224 x 32 x 19	Hitachi B&W	Marubeni Corp.	6/93	VLCC	161,000	315 x 58 x 32	n/a	Bergesen D.Y.	10/93
Sea Princess/VLCC	n/a	326 x 57 x 29	Hitachi B&W	Laredo Shipping	9/93	Aman Bintulu/LNG	16,500	124 x 25 x 17	n/a	Asia LNG Trans.	10/93
Gortys/Bulk Carrier	n/a	224 x 32 x 19	Hitachi B&W	Sumitomo Corp.	9/93	(4) VLCCs	150,000	318 x 58 x 30	n/a	Promise Carriers	12/93 to 11/94
Tarim/VLCC	n/a	328 x 57 x 31	Hitachi B&W	Sumitomo Corp.	9/93	NKK, Tsurumi Shipyard, Japan					
Ishikawajima-Harima Heavy Industries (IHI), Japan						Odense Steel Shipyard Ltd., Denmark					
Toba/Tanker	148,000	319 x 60 x 29	DU-Sulzer	Promise Carriers	7/93	Hull No. L-144/VLCC	n/a	n/a	n/a	A.P. Moller	'93
Okino Shima Maru/Tanker	148,000	319 x 60 x 29	DU-Sulzer	Idemitsu Tanker	8/93	December, 1993					
Sad Samudra/Tanker	22,600	166 x 31 x 17	DU-Sulzer	Nissho Iwai Corp.	9/93	49					
Tugboat	n/a	28 x 9 x 4	n/a	Akita Prefecture	9/93						
Tanker	148,000	319 x 60 x 29	DU-Sulzer	Groria Tanker	10/93						
Arctic Sun/LNG	66,300	226 x 40 x 27	MHI	Phillips Alaska/Marathon Oil	12/93						
Tanker	81,400	263 x 44 x 25	DU-Sulzer	Blue Legend Corp.	12/93						
Containership	56,000	265 x 38 x 23	DU-Sulzer	Nedlloyd Lines	1/94						
FU-32A	22,000	171 x 31 x 15	DU-Sulzer	Cosmic Transport	1/94						
FU-32A	22,000	171 x 31 x 15	DU-Sulzer	Aroma Shipping	3/94						
Tanker	148,000	319 x 60 x 29	DU-Sulzer	Eternity Maritime	3/94						
Ferry	20,700	181 x 28 x 15	DU-SEMT	Shin Nihonkai Ferry	9/94						
Containership	51,000	273 x 32 x 21	DU-Sulzer	P&O	6/94						
Tanker	148,000	319 x 60 x 29	DU-Sulzer	Ocean Links	9/94						
Ferry	20,700	181 x 28 x 15	DU-SEMT	Shin Nihonkai Ferry	7/94						

WORLD SHIPBUILDING ORDERBOOK

SHIPYARD						SHIPYARD					
Vessel Name/Type	GT	Dimensions (m)	Engines	Owner	Delivery	Vessel Name/Type	GT	Dimensions (m)	Engines	Owner	Delivery
Hull No. L-151/Container	n/a	n/a		A.P. Moller	'94	B501/1/04/Passenger/RoRo	n/a	n/a	n/a	OHG, Lubeck	
Hull No. L-152/Container	n/a	n/a		A.P. Moller	'94	(4) Reefers B369/II	n/a	n/a	n/a	Finnlines Group Oy	n/a
Hull No. L-153/Container	n/a	n/a		A.P. Moller	'94	(21, 22 & 23)				Dole Fresh Fruit Intl.	n/a
Hull No. L-148/VLCC	n/a	n/a		VELA	'94	(6) Reefers/ B508	n/a	n/a	n/a	Latvian Shipping	n/a
Hull No. L-149/VLCC	n/a	n/a		VELA	'94	(1 through 6)					
Hull No. L-150/VLCC	n/a	n/a		VELA	'95						
Hull No. L-145/VLCC	n/a	n/a		A.P. Moller	'95						
Hull No. L-146/VLCC	n/a	n/a		A.P. Moller	'95						
Sasebo Heavy Industries, Co., Japan						Transfield Shipbuilding, Australia					
New Vitality/Tanker	n/a	319 x 56 x 30	B&W	Honey Berry	7/93	Shelf Challenger	n/a	67 x 15 x 6	Deutz	Woodside Offshore	11/93
Tanker	n/a	319 x 56 x 29	B&W	Mitsui O.S.K.	12/93	Tug	n/a	31 x 9 x 3	n/a	Entic	10/93
(2) Bulkers	n/a	143 x 24 x 18	B&W	Yick Fung	1/94	Patrol Boat	n/a	32 x 7 x 2	MTU	Ministry of the Interior, Kuwait	8/93
					& 4/94	Patrol Boat	n/a	32 x 8 x 2	Caterpillar	Hong Kong Marine	7/93
(2) Bulkers	n/a	215 x 32 x 18	B&W	Nippon Yusen	6/94	Ulstein Industrier AS, Norway					
					& 8/94	Far Grip/Offshore Service	n/a	75 x 18 x 8	n/a	Farstad Shipping	9/93
(2) Bulkers	n/a	215 x 32 x 18	B&W	Mitsui O.S.K.	9/94	Western Spirit/Seismic Research	3,700	78 x 17 x 8	n/a	Western Geophysical	10/93
					& 11/94	UT 722/Offshore Service	n/a	75 x 18 x 8	n/a	Far Remoy	11/93
Stocznia Gdanska S.A., Poland						UT 745/Platform Supply	4,650	83 (L)	n/a	A.P. Moller	7/94
(Hull #)						Box Shape Bulk Carrier	13,000	140 x 20	n/a	n/a	9/94
B500/01/Containership	n/a	190 x 32 x 19	n/a	SCAC Delmas	10/93	Box Shape Bulk Carrier	13,000	140 x 20	n/a	n/a	12/94
B369/05/Reefer	n/a	138 x 23 x 13	n/a	Aldgate Reefer	6/93	UT 745/Platform Supply	4,650	83 (L)	n/a	A.P. Moller	3/95
B369/06/Reefer	n/a	138 x 23 x 13	n/a	Moorgate Reefer	8/93	Box Shape Bulk Carrier	13,000	140 x 20	n/a	n/a	3/95
B811/01/Passenger Vessel	n/a	n/a	n/a	Polskie Zagle	n/a	Union Naval De Levante, Spain					
B501/1/01/Passenger/RoRo	n/a	n/a	n/a	Finnlines Group Oy	n/a	Las Palmas De Gran Canaria/	10,473	117 x 21 x 13	MAN B&W	Transmediterranea	4/93
B500/02/Containership	n/a	n/a	n/a	Societe Naval Et Commercial Delmas	n/a	Passenger Ferry					
B501/1/02/Container	n/a	n/a	n/a	Finnlines Group Oy	n/a	Santa Cruz De Tenerife/	10,473	117 x 21 x 13	MAN B&W	Transmediterranea	11/93
B501/1/03/Passenger/RoRo	n/a	n/a	n/a	Poseidon Schiffahrt	n/a	Passenger Ferry					

The World Orderbook

Currently there are 1,189 ships (16,004,867-gt) under construction around the world, according to the latest merchant shipbuilding return issued by Lloyd's Register. There are also 999 ships (21,875,233-gt) on order which have not yet been commenced. During the quarter, 414 ships (4,047,736-gt) were commenced; 422 ships (5,057,348-gt) were launched; and 390 ships (4,678,343-gt) were completed. To the date of the report, more than 67 percent of the world order book is scheduled for delivery by the end of 1994. The following is a breakdown by leading countries of the world orderbook.

Country	Under Construction (GT)	Orders Not Commenced (GT)	Total Order Book
Japan	5,921,541	5,124,640	11,046,181
Korea (South)	2,169,456	7,968,263	10,137,719
*China, People's Republic Of	697,109	1,176,893	1,874,002
China, Republic of (Taiwan)	380,700	424,587	805,287
Germany	751,803	999,446	1,751,249
Denmark	485,293	1,131,562	1,616,855
Italy	699,130	562,100	1,261,230
Romania	1,046,490	133,904	1,180,394
Poland	476,277	570,440	1,046,717
Brazil	577,584	376,550	954,134
Finland	279,001	487,400	766,401
Croatia	531,714	210,700	742,414
France	247,060	448,500	695,560
U.K.	244,341	440,500	684,841
*Russia	76,626	515,458	592,084
Spain	280,174	175,950	456,124
*Ukraine	13,221	401,234	414,455

*Information incomplete

Source: Lloyd's Register Shipbuilding Returns, September, 1993

Orderbook By Vessel Type

(In thousands GT)

Country	Tankers	Bulk/Oil Carriers	Ore & Bulk Carriers	General Cargo	Specialized Carriers	Fishing
Japan	4,143	--	3,493	1,794	971	3
Korea (South)	5,505	--	2,576	1,306	344	--
*China, People's Republic of	393	--	1,325	121	6	5
China, Republic of (Taiwan)	151	--	464	187	--	2
Germany	30	--	--	1,388	--	44
Denmark	1,120	182	122	183	5	1
Italy	443	--	126	89	209	2
Romania	276	--	614	241	27	1
Poland	162	--	147	616	2	31
Brazil	377	--	373	201	--	1
Finland	--	--	--	--	461	--
Croatia	402	--	152	72	68	--
France	--	--	--	--	525	2
U.K.	82	--	493	--	97	--
*Russia	187	--	--	334	34	3
Spain	223	--	--	153	--	31
*Ukraine	245	--	95	49	--	13
WORLD TOTAL	13,996	182	10,247	7,377	2,955	214

* Information incomplete

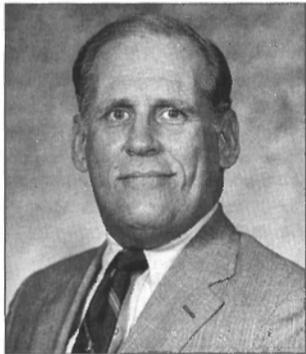
Source: Lloyd's Register Shipbuilding Returns, September, 1993

Crandall Dry Dock To Present 25th Dockmaster's Seminar

Crandall Dry Dock Engineers, Inc. will present its 25th Dockmaster's Training Seminar on February 7-10, 1994 in San Diego, Calif. This course is intended for dockmasters, marine engineers, naval architects and others involved in the docking of vessels. Subjects to be covered during the seminar will include: accidents, types of docks, ship characteristics important to drydocking, calculating block loads, stability of ship and ship/dock system, blocking, docking plans, docking procedures, vessel handling, dry dock inspection, rating of dry docks, case studies and typical predocking calculations required for U.S. Naval vessels.

For more information or to register, contact: Crandall Dry Dock Engineers, Inc., P.O. Box 505637, Chelsea, Mass., 02150, tel: (617) 884-8464; fax: (617) 884-8466.

Ballantine Elected To Newport Board Of Directors



William T. Ballantine

Newport Resources, Inc. has elected **William T. Ballantine** to the company's board of directors. Mr. **Ballantine** has been with Newport since December, 1989, and has served as executive vice president since January 1992.

Newport Resources, Inc. provides integrated environmental and oilfield services to the exploration and production industry.

Shearer & Associates OSHA-Accredited To Certify Maritime Gear

Naval architecture firm Shearer & Associates, Inc., has been accredited by OSHA to perform maritime gear certification.

This lets Shearer & Associates perform required examinations and testing, and issue and maintain requisite records of those shore-based material handling devices and floating cranes and derricks requiring certification under OSHA regulations. The geographic area of operation will be the U.S. Gulf Coast and Inland Waterways.

Currence Named General Manager Of Bollinger's Algiers Iron Works

Richard M. Currence, Jr. has been named general manager of Algiers Iron Works & Dry Dock Co., Inc. by Bollinger Chairman and CEO **Boysie Bollinger**. Algiers Iron Works is a wholly-owned subsidiary of Bollinger Machine Shop & Shipyard, Inc.

Seaspan Acquires Marine Closures Manufacturer

Seaspan International Ltd. of North Vancouver, B.C. has purchased Rivtow Marine Ltd., a marine closures manufacturer. Rivtow has been renamed Manly Marine Closures Ltd. and is now a wholly owned subsidiary of Seaspan International. Manly designs and manufactures commercial doors, windows and hatches for the marine indus-

try.

Seaspan operates Canada's largest fleet of tugs and multi-purpose barges, providing a wide range of marine transportation services to the marine industry on the American West Coast and is engaged in shipbuilding and repair through its division, Vancouver Shipyards Co. Ltd.

Leopold Honored By British Royal Academy Of Engineering

Dr. Reuven Leopold has been elected a fellow by the British Royal Academy of Engineering, the only American so honored in 1993, for his accomplishments as a naval architect. The induction took place at the New Fellows' Dinner in London on Monday, November 8.

Dr. Leopold's innovations in hull design and hydrodynamics as well as his reported responsibility for the designs of over half of all U.S.

Navy ships were factors considered in awarding him this honor.

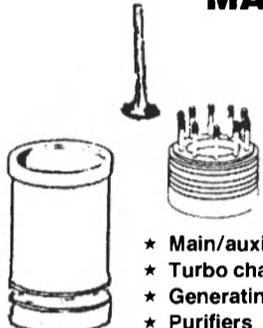
Other foreign fellows this year include **S. Toyoda**, founding chair of Toyota Motor Corp.; **Dr. C.J. Frejaques**, president of the French Academy of Science; and **Dr. P.R. Rao**, science and technology advisor to the president of India.

NRC Stands For National Research Council In Safety Story

In the October 1993 issue, in the safety at sea editorial by the International Salvage Union's Captain **Okkie Grapow**, the initials NRC stand for the National Research Council, in reference to the organization which is working with the U.S. Coast Guard and the U.S. Navy to reassess national salvage posture.

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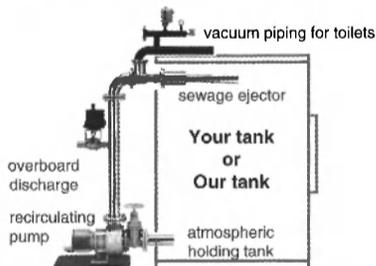
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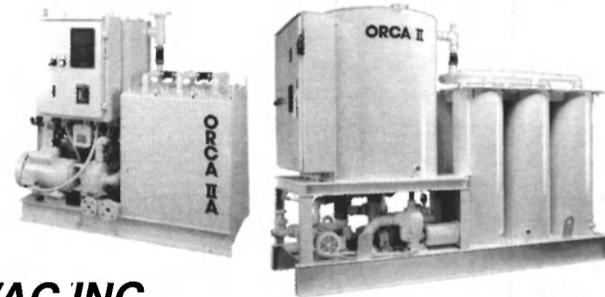
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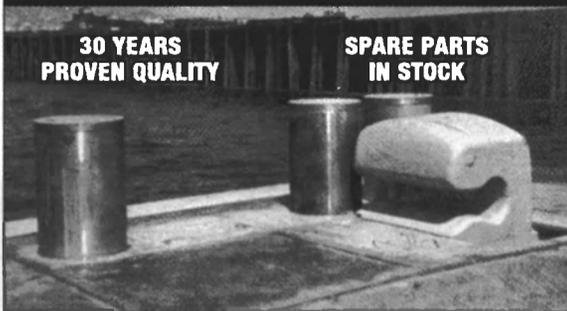
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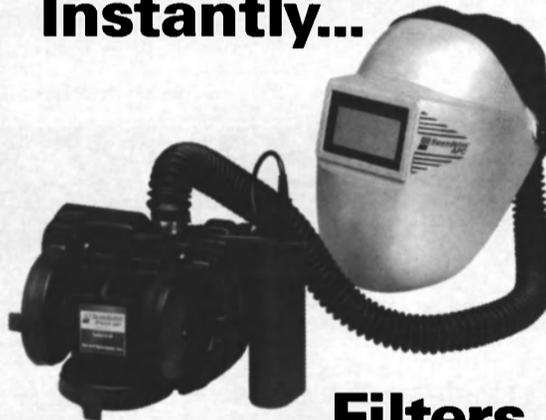
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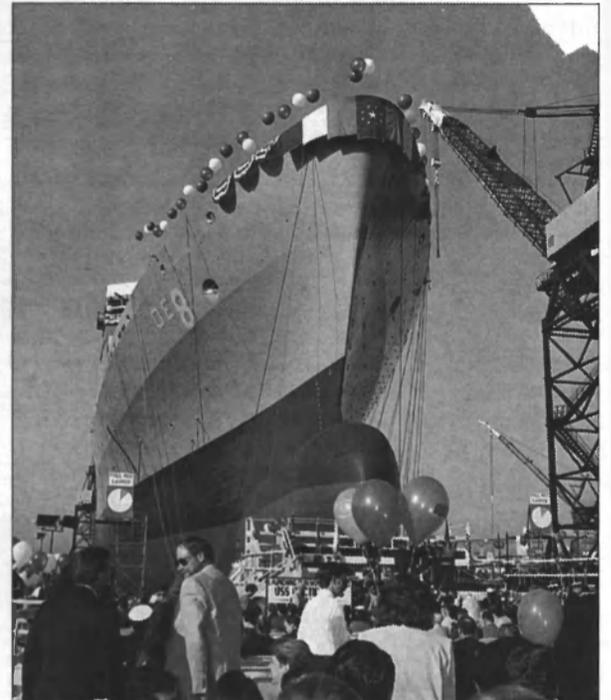
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NASSCO Launches USS Arctic, Fast Combat Support Ship

The USS Arctic (AOE-8), the third of four fast combat support ships being built by National Steel and Shipbuilding Company (NASSCO) of San Diego for the U.S. Navy, was launched from NASSCO's ways into San Diego Bay on Oct. 30. It is approximately 60 percent complete and scheduled for delivery in the first quarter of 1995.



The Arctic (AOE-8) fast combat support ship was recently launched at NASSCO.

The 754-foot supply ship was christened by **Mary Johnston**, the wife of U.S. Senator **J. Bennett Johnston**, who was the keynote speaker at the event. Remarks were given by NASSCO President **Richard Vortmann** and Rear Admiral **John S. Claman**, deputy commander, Naval Sea Systems Command.

The USS Arctic is the fifth supply ship to carry the name, the others of that name having served between 1855 and 1946.

NASSCO is building three other AOE-class ships whose mission will be to receive ammunition, provisions and petroleum products from shuttle ships and distribute them to carrier battle groups while underway.

The USS Supply (AOE-6) is almost complete and scheduled for delivery in the first quarter of 1994. USS Rainier (AOE-7) is mostly complete and is expected to be delivered by the third quarter of 1994.

NASSCO has also received an order from the U.S. Navy to design and build six Strategic Sealift Ships for a potential \$1.3 billion, as well as a \$635 million contract to convert three L-Class containerships into Strategic Sealift Ships.

For more information on the capabilities of NASSCO,

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Selby's SELBASKID Non-Skid Epoxy Resists Grease, Oil, Salt Water

The latest addition to the Selby line is an epoxy non-skid system called SELBASKID, developed for application to slippery deck areas to make them safer for personnel operations and rolling equipment. The company claims it has a very tenacious bond and is resistant to most solvents, grease, oil, salt water, detergents, gasoline, jet fuels and hydraulic fluids.

For more information on Selby products,

Circle 45 on Reader Service Card

Maritime Reporter/Engineering News

Technical, Work Innovations Revolutionize Kvaerner's Govan Yard

by Marcus Gibson,
contributing editor



Queen Elizabeth visited the now-profitable Kvaerner Govan yard to name the bright orange chemical carrier Jo Selje, pictured above.

Five years ago it seemed impossible. Yet a British shipyard, losing nearly \$60 million a year and committed to restrictive practices, has turned a profit using a series of new working methods and technological enhancements.

Finally, said **Kjell Mikalsen**, managing director of Kvaerner's shipyard in Glasgow, Scotland, Govan is in the black.

After pumping \$26.6 million in investment and absorbing nearly \$40 million in cumulative losses into the historic yard since 1988, Norwegian shipbuilder Kvaerner triumphantly expects to make a tiny profit of just \$370,000 this year to December on a turnover of \$118.4 million.

To coincide with the news, **Queen Elizabeth** visited the yard to name a bright orange, 35,000-ton, environmentally-friendly chemical tanker at a ceremony in early October. The orange-painted Jo Selje is the first of its type to be built with a full 6.5-foot double skin around the hull. It will comply with OPA 90 and any new IMO/Marpol regulations introduced in the wake of the Valdez disaster. The Jo Selje's 29 fully segmented tanks provide flexibility over cargoes because it can load or discharge a large variety of different cargoes for a multiplicity of locations simultaneously.

The ship is one of nine newbuilds over the past three years for Norway's Jo Tankers line, the fourth largest chemical tanker operator. Two are to be constructed at Kvaerner's Floro yard in Norway for delivery this November and next May.

Productivity = Profit

The key to Govan's turnaround has been vastly improved productivity. Staff levels have fallen to around 1,500, but new working practices

and technology have worked miracles. Instead of the old system in which 70-ton sections were constructed out on the open berths — prone to all weathers — a series of indoor "tank assembly" sheds have been built, costing around \$16.3 million. Huge block units up to 1,500 tons can now be welded together without interruption. The nine or more blocks can then be wheeled out to the berth on bogie machines and welded, sausage-like, into place. The regular working makes forward planning infinitely more accurate.

The percentage of tasks utilizing automatic or semi-automatic welding has increased from two percent, when the yard was taken over by Kvaerner, to 80 percent today. Furthermore, says personnel director **Bobby Gordon**, "We are designing ships that are easier to build."

The main improvement up to 1996 will be mainly achieved through more efficient working methods. "We want them to work smarter, not harder," said one manager.

All restrictive labor practices have been abolished. The fullest flexibility between craftsmen has been introduced, office staff cut by 30 percent and union shop stewards reduced from 90 to 30. Bell-to-bell working has helped cut absenteeism to a minimum.

Skilled workers now service themselves rather than being dependent on assistants. Employees have been trained in the classroom in how to work more efficiently in teams, and almost every worker has attended some type of training course. Welders have been taught how to handle stainless steel, a common material used in chemical carriers.

From lessons learned when building the first of the new chemical carriers, managers expect a 10 to 20 percent reduction in man-hours between the first and the last vessel in

each series.

Kvaerner's Govan is buoyant about the future. "Third-quarter growth in newbuild contracts are the highest since the mid-80s, at nearly 400," says Mr. **Mikalsen**. Three more ships of similar size — for Norway's Storli group and Saudi Arabia's National Chemical Carriers — will be built following the Jo Selje at Govan. A \$296 million order, it is the largest single merchant shipbuilding contract to be placed in Britain.

In 1996 the Govan yard will also build the hull and fit out the British Royal Navy's new helicopter carrier as a sub-contractor to the U.K. military submarine group VSEL. "Now there's a real need for new ships," Mr. **Mikalsen** added. New environmental rules may cut short the working lives of much existing shipping, he suggested, and rates of scrapping and trade volumes in the Far East will rise, boosting demand. "Since the early 80s, ships have been replaced at a rate of only four percent each year," said Mr. **Mikalsen**. "We believe this may rise to five or six percent."

Kvaerner is the largest shipbuilder in Europe and the fourth largest in the world in terms of compensated gross tonnage. Its worldwide orderbook — 40 ships totalling 2.5 billion tons — is second only to Hyundai of Korea. With a \$1.48 billion turnover and 9,500 staff in its shipping group, the company is specializing in niche markets. Complex, high-quality chemical or LPG carriers are constructed in huge chunks using Govan's new block-unit technology capabilities.

Kvaerner's managers in Scotland believe the Govan yard will be the

lowest cost shipyard in the group, outranking counterparts in Norway, Finland, Sweden and Germany. The managers hope to squeeze a further 40 percent cut in manhours at the site in productivity improvements over the three years to 1996. Lower materials costs — a substantial portion of total costs — are also a priority. Kvaerner was angered when British Steel demanded 10 percent more for Jo Selje's sheet steel if she was to be built at Govan rather than Norway.

"British Steel claimed Norway was a virgin market that merited a lower price," said one of Govan's finance team. But there were other difficulties on the horizon. Russia, Brazil and Taiwan may renew their efforts to grab a bigger slice of the world market. Korea may have taken a big chunk from Japan, which still held 39 percent of the newbuild market last year. In Japan, newbuild prices are fractionally below the break-even point, whereas in Korea, prices have tripled in the local currency, the won.

Kvaerner still has some grumbles over the U.K.'s clawback rules over profits made from subsidized contracts, but the company seems delighted by the accelerated efficiency at Govan. The historic shipyard, where the first ironclads were built in the 1860s, and Scottish engineer **James Elder** pioneered the compound steam engine, brought an end to the days of sail. Kvaerner has made Govan, the last of 13 Upper Clyde shipbuilders that once launched half the world's tonnage, a modern shipyard that can compete in the present.

"We will never regret the step we took," Mr. **Mikalsen** said.

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Vancouver Shipyards Builds Pair Of Tractor Tugs In Five Months



The ship-assist Z-drive tugs Seaspan Hawk and Seaspan Falcon.

In September 1993, Seaspan International Ltd. of North Vancouver, B.C. accepted delivery of two new high performance, 3,000-bhp tugs to provide ship-assist services in the Port of Vancouver: the Seaspan Hawk and the Seaspan Falcon, built by Vancouver Shipyards Co. Ltd., of North Vancouver.

The 80-foot tugs were designed by Robert Allan Ltd. of Vancouver, in collaboration with the owner's technical staff and the shipyard engineering department. Robert Allan Ltd. provided numerical lofted lines, and complete NC definition of all structural parts, which greatly facilitated the rapid construction program. The tugs are configured as "day boats," for operation with a crew of two. The machinery spaces comply with all Canadian Coast Guard requirements for Unmanned Machinery Spaces.

The tugs are of the "reverse-tractor" configuration with azimuthing Z-drive propulsion steering units aft. The main engines are Detroit Diesel model 16V-149TI-DDEC, each rated 1,500 bhp at 1,700 rpm. The Z-drives are Niigata model ZP-2A fitted with nozzles. Steering is by electric motors controlled by a Mechtronics solid state frequency modulating system. The heavy duty bow fender is from Shibata, overlain with aircraft tires for improved adherence.

On trials, the tugs performed to expectations, with a free running speed of 12.4 knots, and bollard pulls of 39.91 tons ahead and 38.10 astern. For more information on the capabilities of Vancouver Shipyard,

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Circle 243 on Reader Service Card

Ownership Shift For Marinette Marine

On Nov. 30, all the outstanding stock of Marinette Marine Corporation was acquired by the MMC Acquisition Company, which is funded by a group of individual investors including **Daniel A. Gulling**, current president and CEO of Marinette Marine Corporation, and Roger H. Derusha, its current chairman, as major investors. Other investors include individuals from Marinette, Green Bay, Chicago and elsewhere around the country, numbering 16 in total. Selling stockholders include **James Derusha, Robert Derusha** and **Roger Derusha**.

Mr. Gulling said he was "glad we were able to accomplish this change in ownership in a way which provides a basis for the company to continue to operate and prosper." He said the company would continue its current plans and complete its U.S. Coast Guard contracts to build two new classes of buoy tending ships. In addition to equity contributions from the investors, some initial financing and additional financing commitments have been made by Michigan Financial Corporation (First National Bank of Menominee) and by Associated Bank Corp.

Bill Would Exempt GMDSS-Equipped Ships From Radio Requirements

A bill was introduced by Congressman **Jack Kingston** (R-Ga.) to waive certain radio operator and equipment requirements for U.S.-flag ships using the Global Maritime Distress and Safety System (GMDSS).

The bill would exempt U.S.-flag ships from what Mr. Kingston calls "arcane" radiotelegraphy and morse code requirements of the 1934 Communication Act.

Virtually all competitive foreign ships have adopted GMDSS as their sole method of distress communications at sea, making them, Mr. Kingston says, safer and much more efficient. By 1995, new U.S. ships will be required to have GMDSS systems, but according to present law, they would also have radiotelegraphy equipment that costs \$220,000 per ship per year, and which generates signals the U.S. Coast Guard no longer monitors and the U.S. Navy has ceased to use as well.

Equipping a ship with a GMDSS system is a one-time cost of approximately \$200,000.

New Pilot Boats From Damen Shipyards

Damen Shipyards, based in The Netherlands, launched a new Damen Stan Tender 1550 in a dedicated pilot boat version.

The design of the steel craft has proved to be an immediate success, with a series of 12 pilot boats under construction.

After thorough consideration of the various material options, Damen selected a steel hull and aluminum superstructure.

The design is based on Damen's experience with medium and high speed craft. Model tests were carried out at the Marin Wageningen Model Test Basin comprising not only hull resistance tests but also propulsion tests.

The new Damen Stan Tender 1550 has many interesting options for service in either tropical or Nordic climates. For example, a sun protection roof and sun awning aft are provided for crew's comfort in tropical climates.

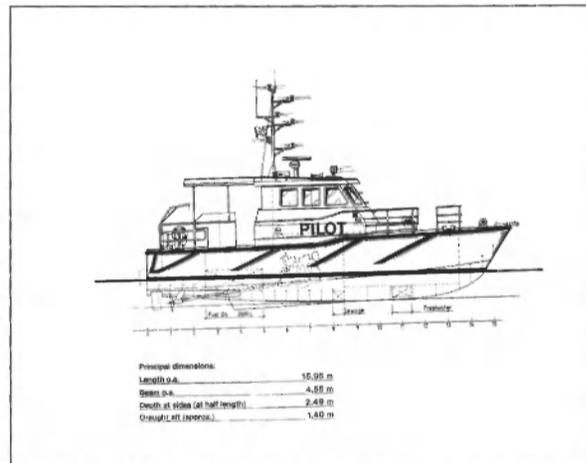
The Stan Tender 1550 has been designed to operate in a speed range up to 24 knots. A propulsion selection includes Caterpillar, Cummins, Deutz, MAN and MTU engines, providing a wide choice to future owners in order to comply with their existing fleets.

MTU engines will be fitted in 10 out of the 12

first pilot craft, which are presently under construction and which shall be classified for operation in the Gulf and Oman Sea.

For more information on Damen Shipyards,

Circle 38 on Reader Service Card



New Damen Combi Coaster 125 Enters Service



The Damen Combi Coaster 125 M/S Kopersand was delivered by Damen Shipyards to her new owners Messrs. Briese Schifffahrt GmbH und Co. KG in October.

The Kopersand is the 23rd vessel from the

successful Damen Combi Coaster 125 range.

In order to perform "door to door" transport, the Combi Coaster 125 is equipped with a hydraulically movable wheelhouse allowing the vessel to pass bridges with low air draft.

Meanwhile, a similar Damen Combi Coaster 125 with the name "Leysand" is under construction for the same customer and is scheduled for delivery at the end of this year.

For more information on Damen Shipyards,

Circle 46 on Reader Service Card

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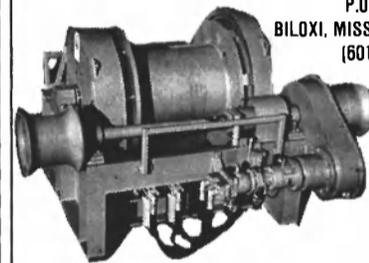
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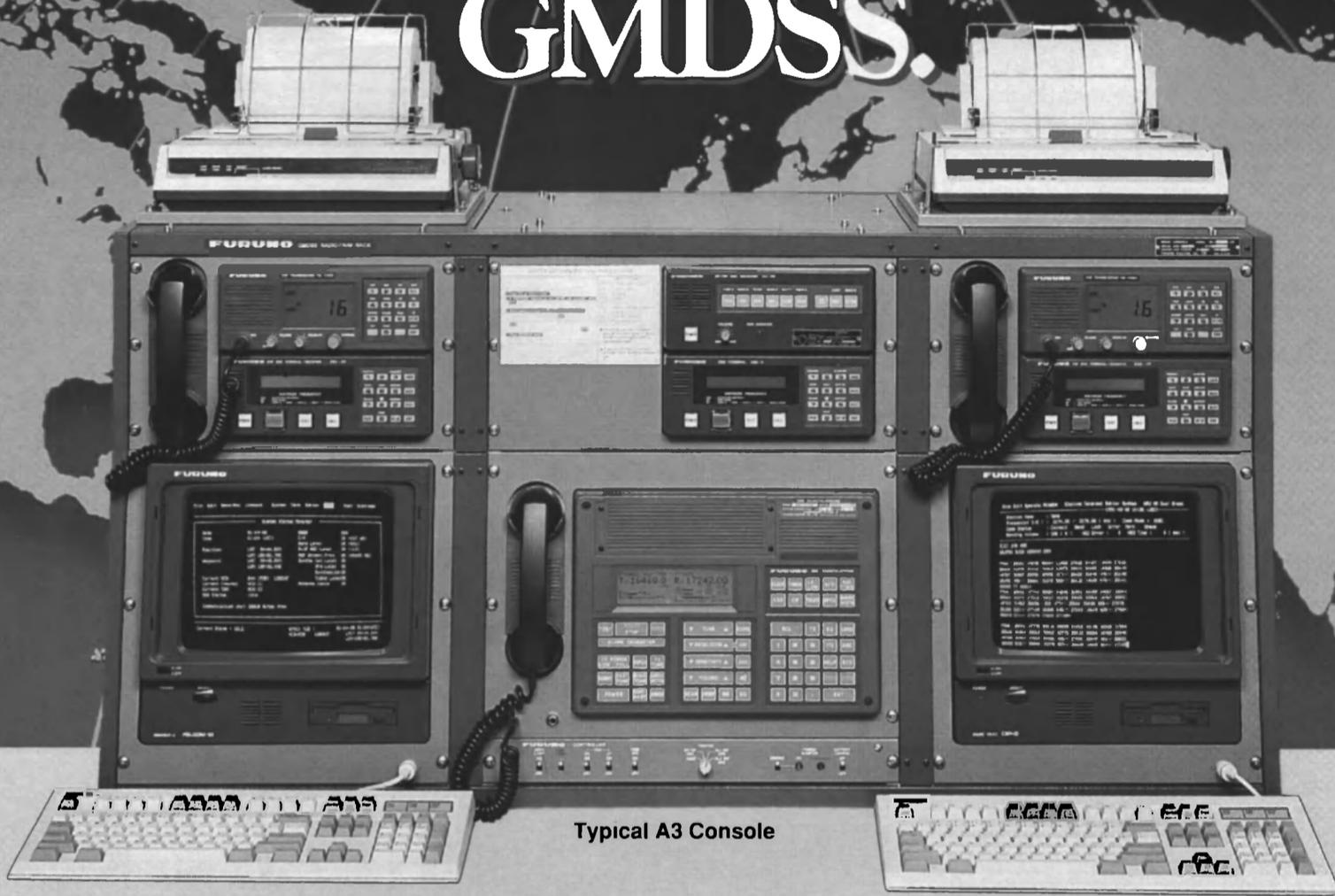
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Circle 211 on Reader Service Card

OR-15 Rust-Preventative Resists Water, Alkalis, Acids

POR-15, Inc., manufacturers of rust-preventative coatings for industry, has announced a new formula specially designed for application directly onto rusted or seasoned metal surfaces. The moisture-cured coating chemically bonds to metal, unlike other coatings that just stick to the surface. POR-15 dries to a rock-hard, nonporous finish that reportedly will not crack, chip or peel. It is actually strengthened by continuous exposure to moisture.

POR-15, Inc., states that its coating was made to fight the very nature of rust. Metal rusts when it's wet, so POR-15 keeps water off metal. Water and moisture soften and weaken other coatings, but they make POR-15 stronger.

POR-15 was tested for 168 hours at 97 degrees F in a condensing humidity salt spray. At the end of this period, coated steel was free of rust or pitting. Acid and alkali resistance tests performed found panels coated were impervious to gasoline, oil, chromic acid, hydrochloric acid, phosphoric acid, sodium hydroxide, caustic soda, 50 percent sulfuric acid, and 50 percent hydrofluoric acid. Other tests included applying over rusty steel substrate as a finish coat, showing essentially no undercutting at the scribed area after 200 hours in a weatherometer. When a 2mm thickness was applied to a lightly rusted steel and then exposed to a salt spray for 1,000 hours, no undercutting was observed in the scribed area at the end of the test period.

For more information on POR-15,

Circle 99 on Reader Service Card

Westinghouse's Series 100 Phone Combines Cellular And Satellite Functions



Available in 1994, Westinghouse's Series 1000 maritime phone is part of a communications network that links cellular phones to a satellite. If you're within cellular range, your calls go through your cellular system. The second you fish outside cellular range, the phone switches to satellite, for up to 200 miles off North American shores.

The Series 1000 is private, is reportedly unaffected by weather, and allows the user to make and receive

direct dial calls. Fax, data transmission and GPS options are also available.

Westinghouse Electric Corp. recently signed a contract with Optus Mobile Pty. Ltd. of Sydney, Australia, to supply a minimum of 7,500 Series 1000 mobile telephones for Optus's Mobilesat[®] service, an advanced mobile telecommunications service to begin in 1994 for all of Australia and 124 miles offshore. Using the Optus satellite, a customer can call anywhere in the world from anywhere in Australia.

Westinghouse has contracted to provide similar mobile telephones in the U.S. and Canada. Last June the company signed contracts totaling \$72 million with the American Mobile Satellite Corporation of the U.S., and TMI Communications of Canada, to design and build communications ground systems in both countries that will provide mobile satellite (MSAT) communications coverage in North America. Westinghouse will also supply satellite/cellular compatible MSAT telephones.

For more information on Westinghouse, Series 1000 maritime phone,

Circle 100 on Reader Service Card

Adaptive Steering Control Standard In Sperry's ADG 3000 Gyropilot

Sperry Marine has introduced its new ADG 3000 Adaptive Digital Gyropilot. According to Sperry Vice President **John V. DeMaso**, the new steering control system has full configuration flexibility, compact size and modular design to meet a wide range of installation requirements. The unit includes automatic track control, radius of turn control and rate of turn control. A preset and accept function for heading order changes offers the user increased control of autopilot steering in both gyro and navigator-aided modes. A full complement of accessories for customizing the system to a vessel's specific needs is available.

The ADG 3000 also includes automatic course order entry from Sperry Marine's Voyage Management System or other navigation systems, and remote steering locations may be added to provide bridge wing or alternate steering stations. Sperry's proven adaptive steering control feature is standard in the ADG 3000. The new compact control panel for the ADG 3000 has been ergonomically designed for simplicity, clarity and ease of operation.

Sperry Marine, Inc., a leading developer and manufacturer of marine electronic navigation and guidance equipment, is headquartered in Charlottesville, Va.

For more information on the ADG 3000 from Sperry,

Circle 104 on Reader Service Card

Scientific-Atlanta's Satellite Systems Inmarsat-Approved For Fax Services

Scientific-Atlanta, Inc.'s MariStar-M[®] and MariStar Multi-M[™] satellite communication systems have been approved by Inmarsat to provide maritime facsimile services. The units, which were introduced in August 1992, remain the only maritime terminals approved for use with the Inmarsat-M digital satellite network.

The MariStar-M consists of a lightweight above-deck antenna and a VCR-sized, below-deck electronics unit. The radome-protected antenna is mounted on the outside of the vessel and the indoor unit is easily installed inside a cabinet or on a shelf. The antenna weighs only 65 lbs. and is 24 inches in diameter.

Scientific-Atlanta also recently introduced a portable briefcase-sized satellite terminal for use on land. The TerraStar[™] is designed for professionals who travel to areas where telecommunications services are not available.

Scientific-Atlanta designs, engineers, manufactures, installs, tests and maintains satellite communications and cable television systems, and has provided 45,000 earth station systems to more than 135 countries. Scientific-Atlanta's Network Systems Group, Atlanta, of which the Mobile Satellite Systems is a part, recently became ISO 9001-certified.

For more information on Scientific-Atlanta's products,

Circle 106 on Reader Service Card

Simplex-Turner Becomes U.S. Rep For Klehma's Hatch Cover Seal Products

Dusseldorf-based Klehma Rubber Engineering have appointed Simplex-Turner, Inc. of New York as their U.S. Representative.

Klehma has pioneered and continues to develop its unique process of hatch cover seal repair for various vessels, including but not limited to bulkers and reefer vessels. The Klehma process is also applicable to Ro/Ro or door seals.

The Klehma process utilizes cold-vulcanization of a complex rubber compound which is unique to the industry. Klehma claims that no other product can rejuvenate seals time and time again to the original shore hardness and specifications.

Klehma's process is reportedly acknowledged by major shipowners to be a cost-effective remedy for hatch cover seal wear. The Klehma process meets the watertightness requirements of most major class societies and regulatory bodies.

For more information on Klehma's hatch cover seal products,

Circle 101 on Reader Service Card

ABB Turbocharger "FABDAB" Database Reduces Downtime

ABB Turbocharger uses an in-house database and registration system of technical specifications and modifications carried out by authorized service centers during the operating life of ABB turbochargers delivered — called "FABDAB" — to provide better and faster service for its customers requiring spare parts and service.

All relevant data on VTR, VTC and RR series turbochargers is now computerized.

The data pertaining to the ship is linked to the ship's name. With that, ABB Turbocharger personnel can access serial numbers and specifications and identify the correct spare parts for over 200,000 turbochargers in service.

ABB Turbocharger Co. of North Brunswick, N.J. is linked on line, via the ATURB information system, to the FABDAB network data bank at ABB Turbo Systems' head office in Baden, Switzerland. More than 30 service centers are expected to be connected by the end of 1993.

For more information on ABB Turbocharger products,

Circle 103 on Reader Service Card

Astilleros And Ficantieri Extend Supply Pact With Harding Safety

Two leading European shipbuilders, Ficantieri group in Italy and Astilleros Espanoles (AESA) in Spain, have extended their joint supply agreement with Harding Safety, a world leader in safety equipment.

The agreement is part of a commitment which the two shipbuilders have made to cooperate in the purchasing of marine equipment. It was reached under the Global Sourcing Project implemented by AESA and Ficantieri in order to classify a limited and selected number of quality suppliers on a long-term basis. The concept behind the Global Sourcing Project is to establish a real cooperation between Italian and Spanish shipbuilders and well-known European suppliers to get the highest levels of competitiveness, to reduce costs, to increase quality and to achieve conditions for jointly developing engineering concepts to reduce lead-time for deliveries.

Harding Safety of Norway is a leading designer and manufacturer of survival craft, cruisetenders, free-fall survival craft, rescue craft, davits and launching systems, all approved by leading classification societies worldwide.

For more information on Harding Safety,

Circle 105 on Reader Service Card

U.S. SECOND-TIER YARD REPORT



Conrad Industries Inc., Morgan City, La.

AWSC Annual Report: *Offshore Barge Building And Repair Up*

Newbuilding and vessel repair decreased in virtually all markets in the second-tier shipyard industry between 1991 and 1992, according to a study of the second-tier industry conducted by the American Waterways Shipyard Conference (AWSC). The study encompasses the replies of 83 companies and looks at three main vessel categories: power driven vessels, river barges and offshore barges, as well as employment information. The second-tier industry consists of shipyards that build and repair tugboats, towboats and barges for the domestic industry; supply boats, crewboats and other specialized vessels for the offshore service industry; and a variety of fishing vessels. Second-tier shipyards also build and repair the U.S. Navy's smaller vessels, the U.S. Coast Guard fleet and vessels operated by the Corps of Engineers and the National Oceanic and Atmospheric Assoc.

Employment Levels Take A Dip, But Remain High Compared To 10-Year Trends

As indicated in the study, employment levels were in a constant decline from 1983 until 1990, hitting a low in 1989 at 13,489 employed. But between 1989 and 1990, employment levels soared nearly 55 percent, rising to a total of 20,889 employees in second-tier yards in 1990.

Employment levels again rose in 1991 to 26,972, but decreased 25 percent, to 20,335, in 1992.

Newbuilding Of Power Driven Vessels Drops Slightly; Barge Production Up

As Table 1 reveals, in the newbuilding market, 1984 was the most productive year for power driven vessels, tallying 350 power-driven vessel newbuilds.

There was a four percent decrease in the number of power driven vessels constructed between 1991 and 1992, when newbuilds in this category--which includes towboats, tugboats, supply and crew boats, fishing vessels, ferries, military vessels and others--dropped from 122 to 117. Construction of towboats edged up slightly, from seven to 10, while the category "Offshore Supply Boat, Crew Boat" took the hardest hit, dropping from 11 newbuilds in 1991 to just two in 1992.

River barge construction reached its highest level ever in the past decade, increasing 27 percent from 604 built in 1991 to 765 built in 1992. By type, the construction of river hoppers increased 39 percent and construction of river deck barges rose 77 percent, the survey reports.

Newbuilds in the offshore barge category rebounded nicely from a decade-low of four manufactured in 1991. In 1992, offshore barge production quadrupled to 16 newbuilds. By barge type, offshore tank barge construction increased 600 percent in 1992.

Repair Work Slides

Table 2 shows that repairs on power driven

vessels rose consecutively from 1983 until 1988, reaching its pinnacle of 8,613 vessels recorded repaired in 1988. Reported repairs then declined for the next two years, then picked up again in 1991. The number of power driven vessels repaired in 1992 decreased 24 percent to 5,827.

Repairs of river barges were highest in 1991 but decreased 26 percent in 1992 to 17,398; repairs for river hoppers decreased 22 percent and repairs for river tank barges decreased 30 percent.

Repair of offshore barges peaked in 1990, numbering 752. Repair in this sector decreased from that number in 1991 to 407, only to increase 25 percent in 1992 to 508.

For a copy of the full report, contact The American Waterways Shipyard Conference, 1600 Wilson Blvd., Ste. 1000, Arlington, Va. 22209, tel: (703) 841-9300.

TABLE 1
New Construction Activity (1983 to 1992)

Year	Power Driven Vessels	River Barges	Offshore Barges
1983	240	483	17
1984	350	221	10
1985	300	277	8
1986	239	166	5
1987	348	145	9
1988	237	278	6
1989	196	571	29
1990	90	521	12
1991	122	604	4
1992	117	765	16

Source: AWSC Annual Shipyard Survey

TABLE 2
Repair Activity (1983-1992)

Year	Power Driven Vessels	River Barges	Offshore Barges
1983	5,422	8,958	531
1984	6,085	9,631	484
1985	6,606	7,079	531
1986	7,341	9,399	317
1987	7,886	11,345	333
1988	8,613	11,071	397
1989	5,974	13,810	356
1990	5,891	15,825	752
1991	7,712	23,386	407
1992	5,827	17,398	508

Source: AWSC Annual Shipyard Survey

Computer-Aided Manufacturing In Small Shipyards

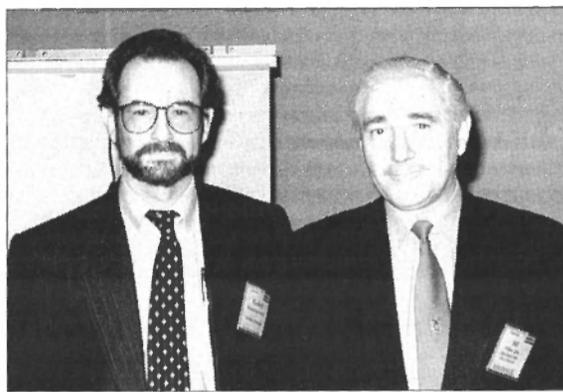
"Small shipyards face a difficult task in effectively employing computers," concludes a recent study entitled *Computer Aided Manufacturing in Small Shipyards: A U.S. and U.K. Comparative Study*.

The study was jointly conducted by **Richard Lee Storch**, associate professor, industrial engineering/shipbuilding, University of Washington (Seattle) and **William Hills**, engineering design center, University of Newcastle upon Tyne (England), and presented at the National Shipbuilding Research Program (NSRP) 1993 Ship Production Symposium, held last month in Williamsburg, Va. Mr. **Storch**, who limited his study to a number of yards he could reach by car in the U.S. Northwest—including Union Bay Shipbuilding, Tacoma Boat, Foss Shipyard, Marco and Marine Industries Northwest—and Mr. **Hills** found a great deal of similarity in the two countries' small yards. The yards examined by both scholars included companies generally employing fewer than 200 people. In total, eight U.S. and 12 U.K. yards were studied. Due to the small sample, the survey sought levels of technology and trends which were representative of current practice in this segment of the industry, focusing on the level of automation in three key areas: design, production management and administration.

In general, the survey found that smaller shipyards have made only small capital investments in computer hardware and software, with the primary investments in computer aided design (CAD) systems and in simple software for word processing and accounting. Nearly all hardware is stand-alone personal computers (PCs), with little or no integration of computer-generated information.

Design

In general, employees involved in CAD were the only ones with formal training on computers. Most small yards involved with new construction have some design capability, whereas repair yards had no in-house CAD capability, instead opting for external consultants based on need. A wide



Richard Lee Storch (l.), of the University of Washington and William Hills of the University of Newcastle upon Tyne, presented a study entitled "Computer Aided Manufacturing in Small Shipyards: A U.S. and U.K. Comparative Study," at the recent National Shipbuilding Research Program Symposium in Williamsburg, Va.

variety of CAD software is employed, but if there were a "standard," it would be AutoCAD in the U.S., with SFOLDS, MAST and AutoSHIP common in the U.K. Lofting practice in small yards varies widely, both between the small yards and as compared to large yard practice. Direct development of Numerical Control (NC) data is uncommon. U.S. practice is moving quickly to the use of sub-contractors for the electronic development of NC data. The primary need is for good 3D hull definition, based on AutoCAD or other design software outputs. There is also a need for small yards to establish better internal control of the parts generation process.

Production Management

Very little (less than 10 percent) use of production management software of any kind was found in the small shipyards in either country. Most systems are manual, and there is no apparent means of integrating any of these systems with each other or with design-generated information. There is also a lack of a repeatable product work

breakdown structure (PWBS) or a build strategy.

Administration

Many of the small yards do employ computers for typical administrative functions, including payroll and invoice/billing. They are stand-alone systems, with no interface with any other computer application in the shipyard.

Overall, the survey concludes that the small yards have a shortfall in computer productivity because of: use of the systems for single-purpose activities; lack of an overall computer application strategy; lack of a manufacturing system capable of deriving maximum benefit from computer applications; a shortage of trained personnel; and a lack of capital for investment.

Recommended Computer Strategy

As small yards need to evaluate the integration of powerful CAD tools and the direct link of NC control to these tools based on cost effectiveness and market prospects, the thrust of the recommendation lies in the production management area. Effective computer (or manual) production management, which is the area currently addressed the least in most small yards, is dependent on two prerequisites: adoption of a product work breakdown structure; and system (data) integration.

A key benefit of the use of computers is the reuse of data. A second key to effective computer utilization is the transfer of data used (or created) by one function to another function. This leads to the need for integration of computer data and company functions which employ the same data.

The report concludes that small yards are not now capable of realizing benefits of advanced software packages.

It suggest they first move to a more structured shipbuilding system before attempting to employ and realize the benefits of Computer Integrated Manufacturing.

TABLE 3
New Construction Activity For 1983-1992

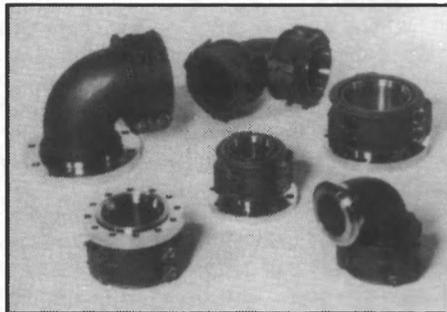
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
POWER DRIVEN VESSELS										
Towboats	17	12	9	1	2	3	4	4	7	10
Tugboats	28	10	8	7	18	11	8	6	6	3
Offshore Supply Boats and Crew Boats	20	21	8	1	23	0	18	2	11	2
Fishing Vessels	24	24	20	21	30	23	15	9	4	15
Ferries, Passenger Vessels	9	24	22	20	17	24	27	17	14	12
Military Vessels	35	120	120	90	122	119	39	27	52	46
Other	107	139	113	99	136	57	85	25	28	29
RIVER BARGES										
Hoppers	429	155	203	120	45	217	484	380	441	612
LASH and SEABEE Barges	3	0	0	4	0	0	0	0	0	0
Tank Barges	25	8	8	4	4	9	18	64	81	92
Deck Barges	17	40	58	31	45	40	49	55	30	53
Machinery Barges and other Work Barges	7	6	3	0	0	2	12	12	36	7
Other	2	12	5	7	51	10	8	10	16	1
OFFSHORE BARGES										
Dry Cargo Hopper and Deck Barges	9	2	1	0	3	3	7	8	1	5
Tank Barges	2	1	2	5	6	2	10	3	1	7
Machinery Barges and other Work Barges	1	2	0	0	0	1	1	0	1	1
Other	5	5	5	0	0	0	11	1	1	3

Source: American Waterways Shipyard Conference

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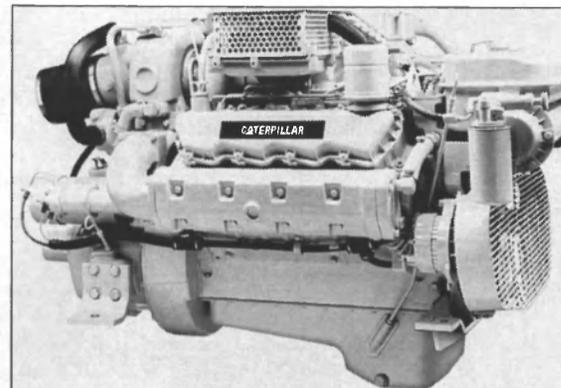


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Circle 291 on Reader Service Card

Caterpillar Offers Rebate On Engines Purchased For Repower



Caterpillar 3208 Marine Propulsion Engine.

Caterpillar Engine Division is offering a repower rebate for Cat 3116 and 3208 engines. A retail customer residing in the U.S. or Canada who owns a commercial workboat, fish boat or pleasure boat is eligible for this rebate. The engine(s) replaced can be diesel or gasoline either Cat engines or a competitive make.

This offer applies to engines purchased between October 1, 1993 and March 31, 1994, and includes any new 3116 or 3208 Marine Propulsion Engine in Cat dealer stock or ordered during the offer period. A maximum of two engines per customer/boat can be purchased during this period.

Once satisfied with the bottom line price quoted for the Cat engine(s), the customer fills out the Repower Rebate form (LED3428) and asks the Cat dealer or representative to deduct \$1,500 for each 3115 TA or 3208 NA configuration, or \$2,000 for each 3208 T or 3208 TA configuration (or the Canadian dollar equivalent).

For a copy of the Repower Rebate form, call 1-800-321-7332 or talk to your Caterpillar dealer. For more information on Caterpillar,

Circle 21 on Reader Service Card

Cargo Tanks Built At Meyer Werft Set Sail For Adriatic



The tug EMS Pull escorts the barge EMS Ponton III as she carries Meyer Werft-built tanks to her Italian owner.

At Meyer Werft in Papenburg, Germany, three cargo tanks built at the yard were loaded onto the barge "EMS Ponton III" and set out on their voyage to the Adriatic.

The 1,600-hp tug "EMS Pull" and the barge are owned by the towage company EMS Offshore Service of Leet. The 3,000-nautical-miles long voyage from Papenburg to the Italian port of Pesaro took approximately 20 days. Fuel oil was bunkered at Gibraltar.

The cargo tanks were ordered by Liquid Gas Equipment Ltd. of Edinburgh; the tanks are for an Italian gas tanker newbuilding.

Clearing agent of the tug and barge in Papenburg is the shipbroker Schulte & Bruns.

With more than 250 cargo tanks built for their own gas tanker newbuildings and for gas carriers at various European shipyards, Meyer Werft is a recognized specialist in this sector.

For more information on Meyer Werft,

Circle 63 on Reader Service Card



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Circle 206 on Reader Service Card

Aug Sin Liu Shipyard To Build Two New Bunkering Tankers For '94 Delivery

Hai Sun Hup Group Ltd., Japan's Mitsui O.S.K. Lines and Asahi Tanker Co. Ltd. have reportedly agreed to own and operate two new bunkering tankers, tankers to be built at the Aug Sin Liu Shipyard. The vessels are to be 3,800-dwt each, named the Seo Empat and Seo Lima, and delivered in August and November 1994, respectively. In a company release, Hai Sun Hup reportedly attributes the newbuildings to taking advantage of the anticipated growing demand in the bunkering market, as well as meet the group's fleet renewal objectives. With the arrival of the newbuildings the company will wholly or partly own 13 vessels.

Malaysian International Shipping Corp. To Spend \$314 Million On New Ships

The Malaysian International Shipping Corp. (MISC) reportedly plans to spend nearly \$314 million on 19 new vessels over the next few years. Reportedly 15 of the new ships will be delivered within the next two years, and the remaining four will be ordered in the next few months. Specific vessel types and yards were not divulged at press time, but it is known that most of the construction will take place overseas, with three vessels reportedly slated to be built in Malaysian shipyards. The 19-ship expansion will raise Malaysia's largest shipping group's capacity by 600,000 metric tons.

Keppel Shipyard Wins \$1.25 Million Contract To Repair Australian Vessel

Keppel Shipyard, a unit of Keppel Corp., has won a contract to repair a 143,950-dwt floating production vessel for Australia's BHP Petroleum Pty. Ltd. Keppel, it is reported, will perform major upgrading jobs on the Jabiru Venture. The contract is worth approximately \$1.25 million.

Lauritzen Starts New Pacific Reefer Route

A leading Denmark shipping group, J. Lauritzen, will reportedly start a new Pacific reefer route between South America's west coast to Japan, via the U.S. west coast. The new route is being established together with the Noboa group, a major Ecuadorian fruit and industrial outfit. The new route will reportedly be based on transport of bananas from Ecuador, and fruit from other South American countries to the U.S. and Japan. Current plans call for Lauritzen to introduce four large cooler-cum con-

tainer vessels into the route, with Noboa supplying three similar vessels as well as three feeder ships, to be jointly chartered.

Alabama Shipyard Signs \$13 Million Contract

Alabama Shipyard, Inc. announced that it has signed a contract with Missouri Gaming Company, a wholly-owned subsidiary of

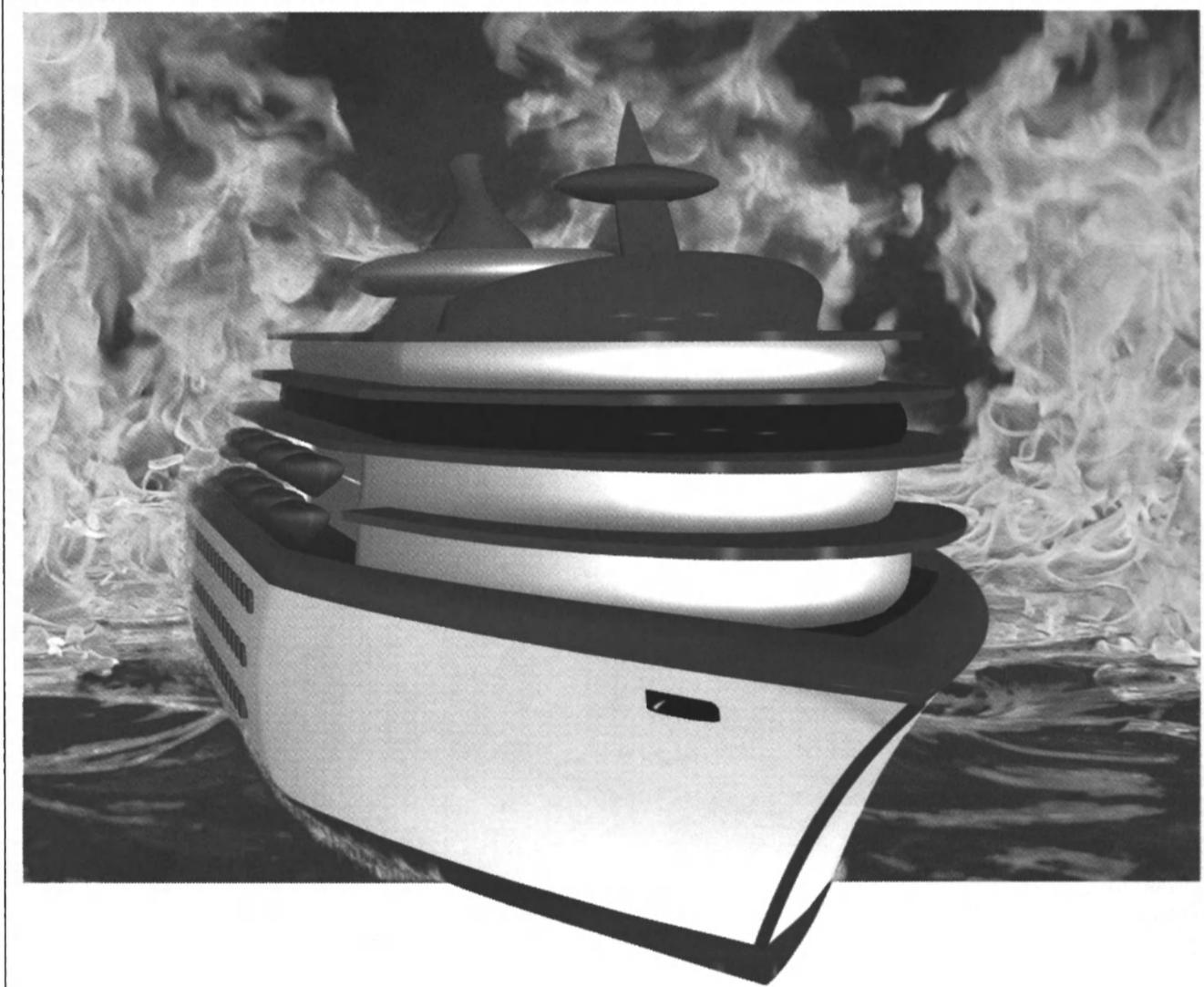
Argosy Gaming Company, for the construction of a \$13-million side wheel style gaming vessel. The 75,000-sq.-ft., three-level "Argosy Riverside Casino" will accommodate 1,800 passengers and crew.

Completion of the Rodney E. Lay & Assoc.-designed vessel is the summer of 1994. Propulsion will be three Schottel "Z" drives powered by three 865-hp (each) Detroit Diesel engines.

Alabama Shipyard is also reportedly a finalist for a Sabine Trans-

portation Co. contract. Alabama Shipyard is one of two final qualified bidders for Sabine's new double hull forebody project for two of its vessels.

The project will consist of the fabrication of a 520-foot by 90-foot forebody and the subsequent joining of the new forebody to the stern of the 15,000-hp S/S Sabine. A second forebody project has been proposed for the S/S Neches. The contract is expected to be awarded in the first quarter of 1994.



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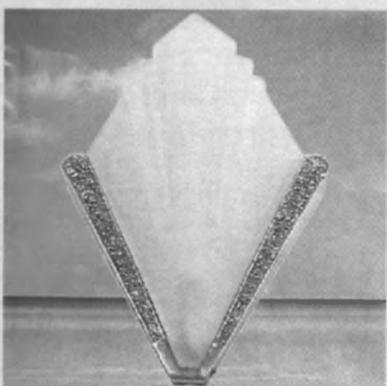
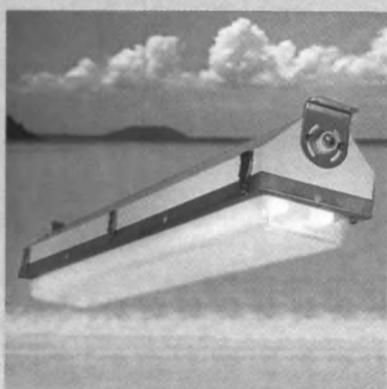
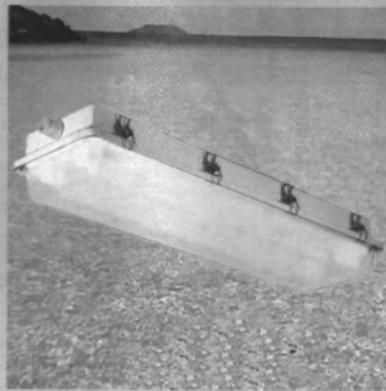
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Circle 282 on Reader Service Card

The Shipbuilders of Spain

The Western Company Christens World's Largest Stimulation Vessel



The Western Renaissance, reportedly the world's largest and most advanced well stimulation vessel, was christened by The Western Company of North America. The 308-foot ship was designed and built to provide proppant fracturing, acid fracturing, matrix acidizing and nitrogen services in the North Sea.

The vessel was built for The Western Company of North America and will be operated by Western Petroleum Services International.

The advanced technology on board includes fully integrated communication between programmable logic controllers and multiprocessor microcomputers, fiber optic data links and a fully redundant dynamic position system for all weather station keeping.

Benefits of the Western Renais-

sance include: greater storage capacity, enabling the vessel to complete more treatments without returning to port for resupply, thus saving valuable rig time and associated costs; and acid fracturing utilizing an equivalent acid volume at higher pumping rates, significantly improving well performance.

The Western Company is headquartered in Houston, Texas, and provides oilfield pressure pumping services such as cementing, well stimulation and related services, both onshore and offshore. Since its founding in 1939, Western has offered the petroleum industry state-of-the-art technology and premium services which are supported by extensive long-term research and development and field laboratory capabilities.

Carrier Transicold's Microlink 2 To Debut At Intermodal '93

Microlink 2 — the next generation in Carrier Transicold's microprocessor-based temperature control for refrigerated container systems — debuted at the Intermodal '93 Show in Hamburg, Germany, December 6-8.

Microlink 2's simple plug-in, plug-out circuitry allows easy addition of operating features to the primary system, and simplifies service. Enhanced computer logic guides all system functions.

Four options can be plugged in at any time in the field, with software that is card-programmable:

- DataCORDER storage and retrieval — records trip temperatures and events, eliminating the need to download after each trip.

- Remote monitoring — a power-line remote monitoring module (RMM) provides an immediate assessment of all system functions.

- USDA/Cold Treatment —

records time and temperature data in accordance with USDA requirements.

- Battery Power-Up Module — energizes the microprocessor to set and change operating parameters when external power is not available.

Microlink 2's dual displays provide side-by-side readings of system setting or function and actual value.

The system's advanced 21-minute pre-trip automatically checks the operating status of every component, and can be conducted under any weather or operating condition.

For more information on Carrier Transicold's Microlink 2,

Circle 3 on Reader Service Card

Motorola's Oncore GPS Receivers Have 21-Second Reacquisition Time

Motorola Inc.'s Position and Navigation Systems Business,

Northbrook, Ill., has introduced the "Oncore" line of global positioning system (GPS) embedded/receiver products for marine, AVL, automotive, avionics and other original equipment manufacturers (OEM) of navigational and positioning devices.

The VP Oncore is embeddable, and then there are the Basic Oncore and XT Oncore GPS boards. All are available with data ports; the product line includes optional extended housing and military connectors. Motorola can work with OEMs to customize software and exclude redundant features when they are already engineered into the host product.

The Oncore GPS products are accurate to within 25 meters, providing latitude, longitude, altitude, velocity, heading, time and satellite tracking status. They also have fast reacquisition and Time To First Fix (TTFF) times. TTFF refers to the time it takes to determine the first position fix after the receiver is turned on; with the Oncore receiver it is 47 seconds if the receiver has current almanac, position and time, and 21 seconds if the receiver has that plus ephemeris. Typical reacquisition time, the time it takes to reacquire a signal blocked for more than 30 seconds, is 2.5 seconds.

For more information on Motorola products,

Circle 39 on Reader Service Card

Vecom's Water Treatment System Selected By Major Dutch Line

Vecom's Automatic Water Treatment system (AWT) has been selected by a major, undisclosed Danish operator to provide protection and operating efficiency for its steam generating plant.

Ten ship sets of the second generation AWT system will augment six systems already in service, the installations being retrofitted to both tankers and container vessels. The AWT system monitors pH and conductivity of boiler water with a responsive control facility that reportedly eliminates human error and provides precise management of the water condition.

For more information on Vecom's AWT system,

Circle 42 on Reader Service Card

Lista's Storage Wall Saves Floor Space With Beams That Hold 1,500 Lbs.

Lista International Corporation has introduced the Lista Storage Wall — a modular drawer, shelf, and roll-out tray storage system — to permit maximum density storage.

Wide span beams, ideal for large

bulk items, hold up to 1,500 lbs and can support a variety of decking including steel, wire and plywood. Different drawer heights provide storage for a range of items, from very small parts to large and heavy tools. Roll-out trays allow easy access for heavy items and can hold up to 770 lbs. The Storage Wall can be designed to include an order issue counter and a 12-inch deep recessed bookcase for convenient storage of reference books.

By implementing the vertical storage concept, valuable floor space can be converted to other uses. The system offers organization, inventory control and fast retrieval, its modular design permitting changes or additions at any time to adjust to new needs.

For more information from Lista International,

Circle 44 on Reader Service Card

SeaBeam To Provide Sonar Mapping System For Navy Research Vessels

SeaBeam Instruments, Inc., has been selected by Halter Marine, Inc. of Moss Point, Miss., to provide a multi-beam ocean mapping sonar system for the Revelle, an AGOR 24 Class research vessel Halter is building for the U.S. Navy. The contract contains options for two additional multi-beam systems for AGOR vessels yet to be constructed.

SeaBeam will deliver the SEA BEAM 2000 Series 2100 Multi-Beam Survey System (Model 2112) for the vessels: reportedly compact, versatile, and capable of operating at multiple frequencies for complete deep and shallow water bathymetric mapping as well as sub-bottom profiling.

For more information on SeaBeam's systems,

Circle 67 on Reader Service Card

Northern Lights Adds Options For Generator Sets

Now both the 16 kW M844 or 20 kW M844L generator sets from Northern Lights are available with front power take off and a choice of 12 or 24 volt electric clutch. With the flip of a switch, 30 hp (24 for the M844) is available to run an SAE "B" splined, 2/4 bolt hydraulic pump. Vibration isolation mounts carry the weight of the PTO and the hydraulic pump, and there is a torsional coupling between the crankshaft and the clutch. The Lugger engines have a sound-muffling maze exhaust system and also feature single-side servicing.

The new PTO packages allow bow thrusters, anchor winches and deck equipment to be powered up without starting the main engine.

For more information on Northern Lights generators,

Circle 68 on Reader Service Card

Atlantic Marine Delivers 230-Foot Passenger/Vehicle Ferry, "Martha's Vineyard"



The Martha's Vineyard, a passenger/vehicle ferry recently delivered by Atlantic Marine.

Atlantic Marine, Inc. of Jacksonville, Fla., recently delivered the ferry Martha's Vineyard to Wood's Hole, Martha's Vineyard, and Nantucket Steamship Authority in Massachusetts.

The 230-foot by 60-foot passenger/vehicle ferry will operate between Woods Hole and Martha's Vineyard.

According to **James Swindler**, design supervisor for the Nantucket Steamship Authority, the vessel's performance so far has been excellent. It was commissioned on November 16 and was placed into service on November 22.

"We used an existing design, but did some design work in-house to modify it," Mr. **Swindler** continued. The design of the Martha's Vineyard is similar to the Steamship Authority's "Nantucket", which was designed by **John Roper**. "We held a series of public meetings to get input from the traveling public, and also incorporated what we learned from past experience. We took the best from the best to eliminate any past problems." Rodney E. Lay & Associates of Jacksonville, Fla. was contracted to do design drawings.

The Martha's Vineyard has the capacity to carry 1,387 passengers, 17 crew and 70 vehicles. Interiors were worked on by Directions In Design of St. Louis, Mo. The passenger area features comfortable seating, individual reading lights and a snackbar with two service counters. A public information system that combines audio messages with lighted message signs throughout the vessel was installed. The decks are accessed by elevator.

"We had a very good experience working with Atlantic Marine," Mr. **Swindler** said. "They're very cooperative," he said of Atlantic Marine's attentiveness to feedback on the ship's construction.

The Martha's Vineyard is powered by two GM-12-645E6A diesel engines with two Reintjes WAF1540

reduction gear systems with a ratio of 3.039:1. Electrical power for ship's service, air conditioning and lighting is provided by two 210-kW Caterpillar 3406B generator sets.

Founded in 1964, Atlantic Marine, Inc. has built all types of vessels, including ferry boats, gaming vessels, research vessels, tugs, barges and fishing vessels for both the American and international markets.

For more information on Atlantic Marine,

Circle 110 on Reader Service Card

MARTHA'S VINEYARD EQUIPMENT LIST

Main engines	GM
Generators	Caterpillar
Bow thruster engine	Caterpillar
Radar	Raytheon
Steering gear	Sperry
Electronic navigation	Raytheon
Reduction gears	Reintjes
360-degree bowthruster	Elliot White Gill
Seating	Turnbull

SWATH Ocean Systems Changes Address

SWATH Ocean Systems, Inc., a world leader in SWATH vessel construction and design, has moved location and expanded its facility.

The new address for SWATH headquarters and construction facilities is 1313 W. 24th St., National City, Calif. 91950, tel: (619) 336-4615; fax: (619) 336-4616.

Presently under construction at SWATH Ocean's National City facility is the 117-foot SWATH Oceanographic vessel "Western Flyer," being built for the Monterey Bay Aquarium & Research Institute.

Sea Recovery's Pocket DS Meter Tests Water Electrically, Affordably



The Sea Recovery Pocket DS Meter is designed to check the product water quality of a desalinator (watermaker), and at only 5.75 inches in length, it can easily be stored or used immediately. Two probe sensors determine the mineral content of water by determining the electrical current through the water. The greater the minerals, the greater the electrical current. The meter operates accurately between 50 and 104 degrees Fahrenheit. The scale readings are in equivalent sodium chloride strength PPM (parts per million) between 10 and 1,000 PPM — typical variances for drinking water. Sea Recovery's Pocket DS Meter is affordable, and also useful for checking potable R.O. water and home tapwater.

For more information on Sea Recovery's Pocket DS Meter,

Circle 102 on Reader Service Card

Danish Danyard Wins Letter of Intent To Build 7 Tankers

Danyard A/S has signed a letter of intent to construct seven chemical tankers for Stolt-Nielsen S.A. for between \$65- and \$70-million a vessel.

The first vessel will be delivered in October 1995. The agreement also includes an option for the delivery of three additional vessels, to be delivered in 1998.

Danyard was reportedly chosen because it is able to build special double-hulled chemical tankers.

Olson Named Chairman Of Board, CEO Of Alaska Washington Ship Repair

Alaska Washington Ship Repair and Steel Fabrication, Inc. (AK-WA) has named **Fred Olson** chairman of the board of directors and CEO. Succeeding Mr. **Olson** as president of the company is **Douglas Johnson**. Succeeding Mr. **Johnson** as vice president is **Frank Johnson**. **William Ball** is now CFO and secretary/treasurer.

Port Everglades Hosts Trade/Transportation Conference

Port Everglades hosted Cargo/Cruise 2000, an intensive program which focused on the future challenges of international trade and tourism, on November 3-5. The conference featured key federal representatives, plus a variety of top industry officials, including: **James Amoss**, chair, executive committee, Lykes Brothers Steamship Co.; **James Carey**, president, Crowley American Transport, Inc.; **Peter Finnerty**, vice-president, governmental affairs, Sea-Land Service, Inc.; The Honorable **Ming Chen Hsu**, commissioner, Federal Maritime Commission; and **Bill McCurdy, Jr.**, logistics and commerce counsel, E.I. DuPont.

Kvaerner Units Win Oil Field Engineering Contract And Chemical Tankers Contract

R.J. Brown and Associates, Kvaerner AS's Australian subsidiary, won a \$2 million contract to design and engineer topside equipment for two offshore oil field platforms in Australia. The contract is for six process/mechanical skids and two structural skids for the Wanaea and Cossack fields on Australia's North West Shelf.

Kvaerner's Kvaerner Floroe yard won a \$140 million contract to build two chemical tankers for Bergen-based shipowner Storli.

Storli reportedly still retains the option to cancel one of the ships, but also has the option to order two additional ships from Kvaerner.

The two ships are scheduled for delivery in 1996 and 1997.

Kvaerner is currently building two other ships for Storli, for delivery in 1995.

Intertanko Offers New Safety And Pollution Prevention Brochure

Intertanko is offering a new brochure titled "Safety and Pollution Prevention - A Continuing Process." The brochure sets out the progress past and present in improving tanker safety and pollution prevention.

The new color brochure shows that most of the recent developments in improved tanker safety have come from shipowners' initiatives, rather than as a result of international rules and laws.

The brochure outlines item-by-item the specific measures and developments which have been taken to increase safety and reduce pollution risks, indicating the costs and the benefits in each case. The brochure also points the way to some future improvements.

To find out more about Intertanko's new brochure, contact the company at tel: +47 22 44 03 40; fax: +47 22 56 32 22.

CALENDAR

DECEMBER

Environmental Compliance Seminar for Small & Medium Sized Shipyards: December 1, Four Seasons Olympic Hotel, Seattle, Wash., 8:00 a.m. - 12:00 p.m. Sponsored by American Waterways Shipyard Conference (AWSC). Con-

tact: **Robert O'Neill** or **Lori Swenningsen**, AWSC, tel: (703) 841-9300; fax: (703) 841-0389.

Coast Guard Approved First Aid at Sea Workshop: December 1-2 Contact: **Sarah Fiskin**, Washington Sea Grant Program, West Wall Building, Room 124, Fishermen's Terminal, Seattle, Wash. 98119, tel: (206) 543-1225.

The International WorkBoat Show: December 2-4, New Orleans Convention Center, New Orleans, La. Contact: **Diversified Expositions**, P.O. Box 7437, Portland, Me. 04112-7437, tel: (207) 772-3005.

Third Joint Residuals Management Conference: December 5-8, Phoenix, Ariz. Contact: **American Water Works Association**, tel: (303) 794-7711 or **Water Environment**

Federation, tel: (703) 684-2400.

Intermodal '93: December 6 Hamburg, Germany. Contact: **Sor Gomm**, conference secretary, Publications Ltd. McMillan House 54 Cheam Common Road, Worcester Park, Surrey KT4 8RJ, U.K., t +44 81 330 3911; fax: +44 81 3 5112.

Fishing Vessel Safety Course: December 6-8, Westport, Wash. Contact: **Steve Harbell**, Washington Sea Grant Program, Marine Advisory Services, Pacific County Courthouse, P.O. Box 88, South Bend, Wash. 98586, tel: (206) 871-9331.

Merchant Marine Personnel Advisory Committee (MERPAC) Meeting: December 7-8, U.S. Coast Guard Headquarters, Washington D.C. Contact: **Scott Glover**, MERPAC Executive Director, tel: (202) 267-0221.

Marintec China 93: December 7-10, Shanghai. Contact: **Chris Cotton**, The Seatrade Organization, 44/F China Resources Building, 26, Harbor Road, Wanchai, Hong Kong; tel: +852 827 9128; fax: +852 827 7831.

American Society of Testing Materials (ASTM) Shipbuilding and Operation in the 21st Century: December 8, Hyatt Regency Dallas-Fort Worth Airport, Dallas, Texas. Contact: **Teresa Cendrowska**, tel: (215) 299-5546 or **Terry Kaminski**, tel: (215) 299-5513, ASTM, 1916 Race Street, Philadelphia, Pa. 19103.

JANUARY 1994

84th New York National Boat Show: January 7-16, Jacob Javits Convention Center, New York, N.Y. Contact: **Michael Duffy**, tel: (212) 922-9607.

"Yacht Insurance Claims" Seminar: January 20, Norfolk Waterside Marriott, Norfolk, Va. Contact: **Stephanie Sayre**, Knox Marine, tel: (804) 393-9788.

FEBRUARY 1994

International Boatbuilders' Exhibition & Conference (IBEX) 1994: February 10-12, Miami Radisson Center, Miami, Fla. Contact: **Tina Sanderson** at CMC, tel: (203) 852-0500; fax: (203) 838-3710.

Underwater Intervention '94: February 7-10, Town & Country Convention Center, San Diego, Calif. Contact: **Underwater Intervention '94 Committee**, P.O. Box 261149, San Diego, Calif. 92196; tel: (619) 422-8918; fax: (619) 426-4421.

FIVE YEAR OUTLOOK FOR U.S. SHIPBUILDING

a detailed assessment of the business outlook and competitive situation facing shipbuilders and ship systems suppliers in the U.S. market

1994 Edition — \$610.00 per copy

IMA's new 200+ page report lays out the entire marine market available in the U.S. over the next five years — providing a detailed analysis of future ship export sales, Jones Act construction and Navy shipbuilding.

In each of 20 market segments we ■ profile the operating inventory ■ assess underlying business drivers ■ examine developments in technology likely to affect future ship design ■ forecast the available ship construction market over the next five years ■ and examine the competition likely to exist. We also identify and examine new government programs and policies designed to assist the U.S. maritime industry.

----- OUTLINE OF THE REPORT -----

I. GENERAL BUSINESS SETTING

- o Future worldwide shipbuilding demand
- o Competitive situation of U.S. builders
- o Shipbuilding policy in the U.S.
- o Likely composition of future U.S. shipbuilding

- o Hawaiian and coastal cruise ships
- o Ferries
- o Seagoing and river barges
- o Offshore vessels
- o Tractor tugs
- o Small passenger vessels
- o Prison barges

II. POTENTIAL SHIP EXPORT MARKET

- o Double hull product tankers
- o Double hull crude carriers
- o Liquefied gas carriers
- o Chemical parcel tankers
- o Cruise ships
- o Line haul and feeder containerships
- o Floating power plants
- o Floating production plants

IV. NAVY AND GOVERNMENT MARKET

- o Naval combatants
- o Sealift ships
- o Survey and research ships

III. JONES ACT MARKET

- o Coastal product tankers
- o Domestic containerships

V. NEW GOVERNMENT PROGRAMS AND POLICIES

- o Ship financing guarantees
- o Shipbuilding R&D initiative
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* * * * *

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Inexa Profil Bulb Flat Technology: To Fight Corrosion, Ease Maintenance And Conversion

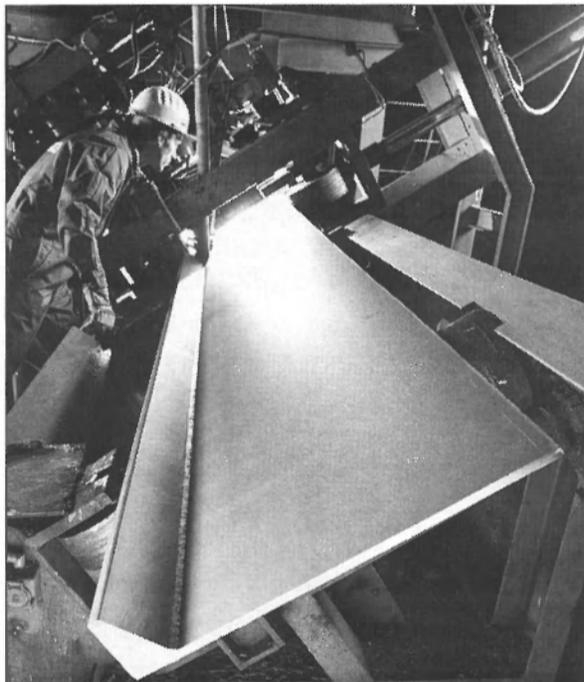
Company's bulb flats to be featured on Kvaerner-built LNG tankers

The Inexa Profil bulb flat line was expanded to include the Jumbo Bulb Flat, a product touted by the manufacturer as an ideal reinforcement solution for the lower side sections of double-hulled tankers and carriers.

The bulb flat line is a compact, rounded-edge design which reportedly simplifies maintenance and rust prevention. The bulb flat allows easy access for all types of surface preparation, and features no sharp corners which reportedly can prove difficult to reach. Up to the introduction of the Jumbo Bulb Flat, the one serious drawback to the bulb flat line was that it was only available in sizes up to 430mm. But the Jumbo is available in sizes from 400mm to 650mm, a dramatic extension in the bulb flat range. The profile is, as are all smaller bulb flats, rust resistant. Shotblasting, coating, inspection and cleaning are all simplified, and the surface area is reportedly smaller than a comparable T-section or angle—a fact which can help lower production and maintenance costs.

While the bulb flat design is widely accepted now in ship design overseas, according to **Karl-David Sundberg**, the company's president, Inexa Profil has an interested marketing eye pointed at the U.S. market, and the expected new business as traditional defense companies capture commercial business.

"We are excited about what goes on here, this market is very interesting for us," Mr. Sundberg said. "U.S. yards must capitalize on the latest design trends to make the leap to commercial, and we can help them as we provide the technology and experience to make them proficient."



Finishing touches being made to one of Inexa Profil's new jumbo bulb flats; seen here in the largest 650mm size.

Expanding Product Lines

To further enhance its business, Inexa acquired the former Rockment A/S of Denmark. The new name for the company is Inexa Panel, and it offers a complete TNF (Thermal insulation, Noise reduction and Fire protection) brand range of wall, ceiling and floor panels. Inexa Panel has been a market leader for 20 years, and the TNF brand is an industry standard. Among its accomplishments: the pioneered use of "softcore" panels with the installation of TNF on the Golden Odyssey in 1974.

December, 1993



The contract for delivery of shipbuilding sections from Inexa Profil is signed in Lulea on October 28, by purchasing manager **Jorma Joikinen**, Kvaerner Masa Yards in Turku (left), and Inexa's managing director **Christer Olson**. The signing is supervised by Inexa Profil's chairman of the board **Karl-David Sundberg** (standing left) and Kvaerner Masa Yard's manager **Robert Stenius**.

Inexa Wins Kvaerner Contract

Inexa was awarded a contract from the Finnish Kvaerner Masa-Yards to supply bulb flats as stiffening elements for the four LNG ships to be built by Kvaerner Masa-Yards shipyard in Turku for Abu Dhabi National Oil Co. "The fact that we have been able to secure the complete order for bulb sections for this prestigious project in the face of strong international competition strengthens our position as a world leading supplier of shipbuilding sections," said Inexa's **Christer Olson**.

For free information on Inexa Profil's Bulb Flat line of products,

Circle 30 on Reader Service Card

For free information on Inexa Panel's TNF panel line,

Circle 31 on Reader Service Card

Rowland Becomes Chairman Of AAPA'S U.S. Delegation

Charles M. Rowland, executive director of the Canaveral Port Authority, was officially installed as chairman of the U.S. Delegation of the American Association of Port Authorities (AAPA), at its 82nd Annual Convention held recently in Halifax, Nova Scotia.

Mr. Rowland has served as executive director of the Canaveral Port Authority since March 1980.

The AAPA is an alliance of 120 seaports in 17 nations of the Western Hemisphere. The organization promotes the common interests of ports and provides leadership on trade, transportation, environmental and other issues related to port development and operations.

Hitachi Zosen Delivers Variety Of New Vessels



The Trident Ace, first of Hitachi Zosen's Superjet-30 series of foil-assisted catamarans.

Hitachi Zosen's recent deliveries include some very different ships for very different markets — one high-speed passenger vessel, two VLCCs and a bulk carrier — each with its own design distinctions.

The Trident Ace, the first of its Superjet-30 series of foil-assisted catamarans, was built at the Kanagawa Works and delivered to Fuke Kaiun Co., Ltd. of Osaka. The 103-foot hybrid ship has twin hulls which provide buoyancy, assisted by submerged hydrofoils fore and aft providing lift for a maximum speed of 40 knots. At 32 feet wide, it has a capacity of 160 passengers.

Hitachi Zosen is currently working on six other Superjet-30s at its Kanagawa Works, and expects more orders for this type of vessel.

Hitachi Zosen's Ariake Works delivered two VLCCs recently: the 275,546-dwt (metric) Sea Princess, 1,070 feet long with a breadth of 185.7 feet and a depth of approximately 94 feet, was delivered to Laredo Shipping Co., Ltd., and the 280,954-dwt (metric) Tarim, 1,076 feet long with a 187-foot breadth and a 98.4-foot depth, was delivered to Wiltank I SK.



The Tarim, one of two VLCCs recently delivered by Hitachi Zosen.

The Sea Princess' engine is a low-speed, long-stroke, static-pressure supercharged Hitachi Zosen B&W 6S80MC, reportedly easy on fuel with a speed of 14 knots. The Tarim's engine is a similar model HZ B&W 7S80MC that gives the Tarim a 15-knot speed. Both vessels have large bulbous bows below the waterline for more efficient propulsion, and both have cargo oil lines of coated steel for high corrosion resistance and which allow for loading three grades of crude.

Hitachi Zosen also delivered the Gortys, a 71,504-dwt (metric) bulk carrier — the 71st Panamax Optima vessel produced by the company — from its Maizuru Works to the Sumitomo Corp. At 705 feet long, it has a breadth of approximately 105 feet and a 61-foot depth. The vessel can carry a variety of cargoes, including grain, ore and coal, and its HZ B&W 6S60MCE engine provides fuel economy and speeds in excess of 16 knots.

For more information on Hitachi Zosen,

Circle 33 on Reader Service Card

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.

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ABSORBENT PRODUCTS

Haz-Maz Response Technologies, 5841 Box Canyon Rd., La Jolla, CA 92307
Sorbent Products, 645 Howard Ave., Somerset, N.J. 08873

ACOUSTICAL INSULATION

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Callenberg Engineering, 2010 North Miami Ave., FL 33127
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Stal Refrigeration AB, Butangsgatan 16, S-601 87 Norrköping, SWEDEN

BALLAST

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Zidell Marine Corp., 3121 SW Moody Ave., Portland OR 97201

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Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orkot Engineering, 2535 Prairie Road-Unit D, Eugene, OR 97402
Tenmat Inc., 511 Interchange Blvd, Newark, DE 19711
Thordon Bearings Inc., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

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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. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

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V6A1E1

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Intergraph Corporation, 2051 Mercator Drive, Reston, VA 22091-3413
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TIMSCO, P. O. Box 91360, Mobile AL 36691

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Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
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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
Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Dr., Alpharetta, GA 30022
Teleflex Naval technologies, 205 Church Rd., North Wales, PA 19454

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Willem Pot b.v., P. O. Box 29102, 3001 GC Rotterdam, The Netherlands

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Nor Tech, 21 West Street, Ste. 3100, New York, NY 10006
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Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084
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SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116
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A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

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NWR, Inc., Environmental Systems Division, Box 58626, Salt Lake City, UT 84158

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Liton Special Devices, 750 W. Sprout Road, Springfield, PA 19064

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Hardware Specialties, 48-75 36th St., L.L.C., NY 11101

Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835

Okabe Co., Inc. 645 Forest Edge Drive, Vernon Hills IL 60061

Revcar Fasteners, P.O. Box 345, Roanoke, VA 24003

Robbins Manufacturing, 1200 Airport Rd., Fall River, MA 02722

FENDERING

BF Goodrich, 150 Division Drive, Wilmington, N.C. 28401

FENDERING SYSTEMS/BUOYS - Dock & Vessel

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston, TX 77020

Schuyler Mfg. Co., Inc., 16901 Woodville-Redmond Rd., Woodville, WA 98072

Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook, VA 22624

Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160

Ultra Poly Inc., 2926 South Steele, Tacoma, WA 98409

Viking Fender Co., 50 Church Street, Sea Bright, NJ 07760

FIBERGLASS PIPE & FITTINGS

Ameron Fiberglass & Pipe, 61 Executive Ave., Edison, NJ 08817

FIBER OPTIC SYSTEMS

AT & T Cables System/Fiber Optic Div., 111 Madison Ave., Morristown, NJ 07962

FIN STABILIZERS

Blohm & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY;
U.S.A. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

MARINE FIRE PROTECTION

Hiller Systems, 3710 Lakeside Court, Mobile, AL 36693

FIRE DETECTION SYSTEMS

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY

FIRE STOP PRODUCTS

NMP, 12437 E. 60th St., Tulsa, OK 74153

FLAME CUTTING MACHINE

Bug-O-Systems, 3003 West Carson St., Pittsburg, PA 15204

GALLEY EQUIPMENT

Atlas Marine Services, 6960 NW 46th St., Miami, FL 33166

Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062

Gaylord Industries, 10900 S W Avey St, P.O. Box 1149, Tualatin, OR 97062

Lang Manufacturing, P.O. Box 905, Redmond, WA 98073

Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

Toastmaster, 1400 Toastmaster Dr., Elgin, IL 60

Micrologic's AccuChart Holds 700,000 Cartographic Points

Micrologic has added its second full function plotter, AccuChart, to its product line. The unit has a unique transreflective 11-inch (diagonally) liquid crystal display (LCD). Adjustable backlighting and contrast levels allow operation in direct sunlight. The AccuChart operates with software from Navionics, a world leader in electronic charts. Its credit-card-sized maps reportedly allow navigation throughout most of the world, never allowing a boat's position to become lost between two screens. Its built-in world chart allows its immediate operation.

Controlled by a powerful 8/16-bit CPU, the unit stores up to 700,000 cartographic points, 40 waypoints, 200 markers, 500 trackpoints, and one track of up to 2,500 nautical miles in a three-year non-volatile memory backup. For more information on Micrologic's AccuChart,

Circle 94 on Reader Service Card

Saj Instrument Measures Draft With Easy Installation

The Finnish Aaland Island-based Saj Instrument Ab Ltd. introduced a new unique series of systems for measuring a ship's draft, dynamic trim and heeling. The SAJ DRAFT & TRIM/LIST system has been designed and developed to solve the draft measuring in ships more conveniently, with a minimum of expensive pipes and cables. Draft, trim and heeling information is required for stability calculations, ballast pumping, cargo handling and during loading and discharging.

Calculations are made in the unit and transmitted to several positions. A multi-display is available for car-ferries, Ro/Ro ships, etc., and the system is available in several configurations. For more information on Saj Instrument's DRAFT & TRIM/LIST system,

Circle 95 on Reader Service Card

Thordon Becomes ISO 9000-Certified

Thordon Bearings Inc., a member of the Thomson-Gordon Group, has received ISO 9000 certification. Developed by the International Standards Organization, the ISO 9000 series provides comprehensive quality assurance procedures. ISO 9002 certification, which Thordon now holds, verifies exceptional, consistent quality assurance in order management, production and assembly.

Said **David Read**, Thordon Bearings' president, "Certification confirms what we've known for years — that we consistently provide customers with exceptional quality and value in all our products... It identifies Thordon bearings as a world-class product for marine, hydro and industrial applications." For more information on Thordon Bearings,

Circle 96 on Reader Service Card

ScanMarine Wins Turn-key Contract For Second Refit On Same Vessel

ScanMarine Group (SMG) of Sweden has announced a new turn-key order from Oresundsvarvet, Landskrona, Sweden, for the extension of the passenger cabin capacity of M/S Gotaland for its new trade between Trelleborg, Sweden and Rostock, Germany. The complete conversion will cost approximately \$10 million. SMG was chosen turn-key planner and deliv-

erer; Oresundsvarvet won the contract in competition with 15 other North Europe yards. The work will be performed in Landskrona, where the ship will be lengthened 110.2 feet and a total of 56 double cabins built at crew and bridge deck. An earlier conversion was done in 1992 by the same group, Oresundsvarvet/ScanMarine. For more information on ScanMarine Group,

Circle 97 on Reader Service Card

French Gear, Propeller Makers Expand Into North America

Masson, the French designer and producer of marine reduction gears, and the propeller manufacturer Renou-Dardel (RDL), also of France, have named three sales agents in North America: Transmission America of Lake Charles, La.; Hough Marine and Machine, Inc. in Seattle; and Jastram Engineering, Ltd. of Vancouver, B.C. will sell Masson and RDL equipment.

Masson products include reversing reduction gears; straight through gears for controllable pitch propellers; integral shaft brakes; multiple PTO arrangements; and coaxial and offset shafts. For more information on Masson or RDL products from its new representatives,

Circle 98 on Reader Service Card

Bilge Rat Buoy Absorbs Up To Two Gallons Of Oil From Bilge

The Bilge Rat™ oil-absorbent buoy floats from American Supply & Equipment, Inc. of Fort Walton Beach, Fla., is placed in a boat's bilge to absorb and retain toxic petrochemicals up to 20

times its own weight: 1.5 to two gallons of floating oils. Bilge absorption booms have reportedly been able to remove only one to two quarts of oil previously. Polyloops on each end can be used to connect multiple Bilge Rats or attach a pullout line for easy retrieval. Custom sizing is also available. For more information on the Bilge Rat,

Circle 109 on Reader Service Card

Coltec Unit Becomes ISO 9001 Certified

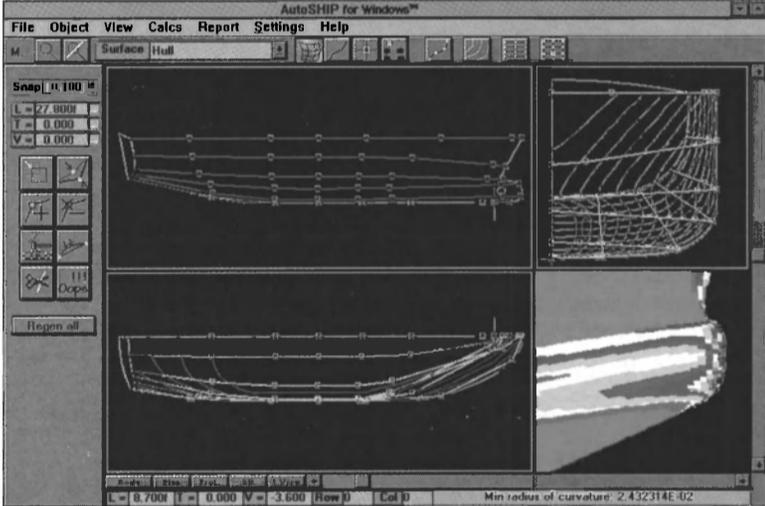
The Fairbanks Morse Engine Division of Coltec Industries Inc. has achieved ISO 9001/ASQ Q91 registration, a rigorous quality standard established by the International Organization for Standardization. **Richard L. Dashnaw**, president of Fairbanks Morse Engine, said, "We are extremely proud to reach this goal on our first attempt and within one year of beginning this effort. Our employees exhibited a strong spirit of teamwork to achieve this certification." Fairbanks Morse Engine manufactures large, heavy-duty diesel, gas and dual-fuel engines for marine propulsion, stationary and marine power generation, and cogeneration. Coltec Industries Inc. is a New York-based manufacturing company servicing aerospace, automotive and other industrial markets. For more information on the Fairbanks Morse Engine Division of Coltec,

Circle 108 on Reader Service Card

Gladding Hearn Builds Pilot Boats

In November's Outstanding Workboat feature, text regarding Gladding Hearn's the Golden Gate could be construed as indicating it was the first pilot boat built by the yard. This is not the case.

This is our new AutoSHIP for Windows™ program. We started with NURBS curves and surfaces, the high-end CAD standard. Then we added new extensions to NURBS to allow extruded, rotated, blended and developable surfaces. Curves may be embedded on surfaces or even other curves. Any edge of a surface may be attached to a curve or another surface. Change the hull shape and have the deck, cabin, keel, even thrusters and moonpools adjust automatically. AutoSHIP for Windows™ exports to AutoHYDRO, AutoSHIP BUILDER, AutoPLATE, our nesting and NC cutting programs, DXF, IGES, 3-D Studio™ and other major programs.



YOUR HULL DESIGN SYSTEM HAS JUST BECOME AN ENDANGERED SPECIES

WHETHER YOU ARE USING the time-honored battens and splines or the latest computerized system from our competitors, your hull design system is now obsolete. But don't just take our word for it, ask the competition. Can they cut a bow thruster tunnel into a hull? Or change hull shape and have the thruster intersection update instantly and automatically? Can they display shaded, rendered models with up to 16.7 million colors on industry standard software? Can they support virtually any PC-compatible graphics adaptor, printer or plotter?

We can. Ask us for your free demo disks on AutoSHIP for Windows™ and your free catalog on our hull design, hydrostatics, ship construction, resistance & propulsion and ship-board systems software.



Windows™ is a trademark of Microsoft Corporation.
3-D Studio™ is a trademark of Autodesk, Inc.

a u t o s h i p

Systems Corporation

(formerly Coastdesign Inc.)

403-611 Alexander Street
Vancouver, Canada V6A 1E1
Ph: (604) 254 4171 Fx: (604) 254-8171

Circle 276 on Reader Service Card

KEEL COOLERS

R.W. Femstrum & 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

LEAK DETECTION

U.E. Systems, 12 West Main St., Elmsford, NY 10523

LIFEBOATS/RAFTS

American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Boston Whaler, Inc. Commercial Products Div., 1149 Hingham St., Rockland, MA 02370

Fr. Fassmer GMBH & Co., D-2876 Berne 2, Wese, GERMANY

Norsafe AS, P.O. Box 115, N-4818 Faervik, Norway

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

Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale, FL 33310-5247

Archway Marine Lighting, 4501 Swan Ave., St. Louis, MO 63110

Fishermans Wholesale Marine Supply Co., Inc. 4540 B Downman Road

New Orleans, LA 70126

Golten Marine, 160 Van Brunt St., Brooklyn, NY 11231

The L.C. Doane Co., P.O. Box 975, Essex, CT 06426

Julian A. McDermott, 1639 Stephen St., Ridgewood, NY 11385

Nautilus Equipment Ltd., P.O. Box 66, Station M, Halifax, Nova Scotia B3J 2L4,

CANADA

Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581

Phoenix Products, 6161 N 64th St., Milwaukee WI 53218

LINE BLINDS

Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LIQUID LEVEL INDICATORS

Setcor, 2 Dean St., Tenafly, NJ 07670

LIQUID OVERFILL PROTECTION SYSTEMS

E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026

Setcor, 2 Dean St., Tenafly, NJ 07670

LOGISTICS

VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564

QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455

LUBRICANTS

Jet-Lube, Inc., 4849 Homestead Road, Houston, TX 77226

Pre-Lube, 13790 NW 4th St., Ste. 111, Ft. Lauderdale FL 33325

B P Marine Americas, 200 Westlake Park Blvd., Houston, TX 77079-2682

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING

Del Gavio, 619 Industrial Rd., Carlstadt, NJ 07072

Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

Golten 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 Ssystems, 800 Ferndale Pl., Eahway, NJ 07065

MACHINING—On Site Repair

Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

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

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

Marine Accommodations Inc., 8535-3 Baymeadows Rd, Ste 140, Jacksonville, FL 32256

Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

MARINE CEILING

Hydro-Aluminum, Vik Verk, N-5880 VIK I SOGN, Norway

MARINE COATINGS

Vecom USA, 236 St. George Avenue, Jefferson, LA 70121

MARINE ELECTRONICS

High Seas Technology, Inc., 2965 West State Rd., Fort Lauderdale, FL 33312

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

Marine Accommodations Inc., 8535-3 Baymeadows Rd, Ste 140, Jacksonville, FL 32256

Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

Wilson & Hayes, 1601 Eastlake Avenue, East, Seattle, WA 98102

MARINE GEARS

Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227

MARINE RADAR COMPONENTS

EEV, Inc., 4 Westchester Plaza, Elmsford, NY 10523

MARINE SHIP MANAGEMENT

BarbaArkton, 1810 Chapel Ave. West, Cherry Hill, NJ 08002

MARINE SURPLUS SALES

Defense Reutilization & Marketing Service, 2163 Airways Blvd., Memphis, TN 38114

MARITIME EDUCATION

Seamens Church Institute, 741 Water St., New York City, NY 10038

METAL PRODUCTS

Engineered Data Products, P.O. Box 565, Woodbury, NJ 08906-7565

Jamestown Metal Marine Sales, Inc., 4710 N.W. Second Ave., Boca Raton, FL

MONITOR CONTROL ALARM

Tracor Marcon, 800 Femdale 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., 9487 Regency Square Blvd., Ste. 500, Jacksonville, FL 32225

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 Ridgeway Dr., Suite 403, Metairie LA 70002

Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129

Diversified Technologies, 812 Live Oak Dr., Chesapeake VA 23320

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

The Glosten 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., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824

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, 1515 NW 7th St., Ste. 124, Miami FL 33125

Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225

David P. Levy Enterprises, 527 Legendre Dr., Sidell, LA 70460

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

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

John V. McCollum, Inc., 1199 Long Point Road, Mt. Pleasant, SC 29464

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

MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090

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 Turquois St., Ste 217, San Diego, CA 92109

Maritech, Seaciff, 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

Northern Marine, P.O. Box 1169, Traverse City, MI 49685

Ogden Government Services, 3211 Jermentown Rd., Fairfax, VA 22030

Olsen Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777

Omega Marine Engineering Systems, Inc., 11757 Katy Freeway, Ste 1100, Houston TX 77079

QED Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455

M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Fulsom St.,

Ste. 301, San Francisco, CA 94107

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

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, Bamegat Light, NH 08006; 2 Skyline Pl., 5203

Leesburg Pike, Suite 700, Falls Church, VA 22041;

50 Vashell Way, Orlinda, CA 94563

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

R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235

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

NAVAL BOAT BUILDERS

Atlantic Boat Group, Inc., 1850 Lake Park Dr., Ste. 216 Smyrna, GA 30080

NAVIGATION & COMMUNICATIONS EQUIPMENT

AT&T, High Seas Dept., 412 Kemble Ave., Room C380, Morristown, NJ 07960

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY

Cellnet Corp, 400 Main St, Stamford, CT 06901-3004

Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024

C. Plath, 222 Severn Ave., Annapolis, MD 21403

Electronic Marine Systems, 800 Femdale Pl., Rahway, NJ 07065

Fairtide Enterprises, Inc., 2536 Sonata Dr., Columbus, OH 43209

Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080

Hose McCann, 9 Smith St., Englewood, NJ 07631

Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950

IDB Mobile Communications, 1828 L Street NW, Suite 660, Washington, D.C. 20036

Kenwood USA Corp., Marine Prod. Div., 2201 E. Dominquez St., Long Beach, CA 90810

Mackay Communications, 300 Columbus Circle, Edison, NJ 08837

Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135

Megapulse, Inc., 8 Preston Court, Bedford MA 01730-2380

Nautronix, 15401 Vantage Pkwy W., Houston, TX 77032

Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY

Novatech, 820 Cormorant St., Victoria, BC V8W 1R1, CANADA

Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581

Raytheon Marine Co, 46 River Road, Hudson, NH 03051

Robertson Marine Systems, 3000 Kingman Street, Suite 207, Metairie, LA 70006

SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116

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

Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036

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 Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086

Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130

World Communications Sys., 11834 Canon Blvd., Newport News, VA 23606

OIL—Marine—Additives

Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001

Shell Oil, P.O. Box 2463, Houston, TX 77252

Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS

ACS Industries, Inc., 14208 Industry Rd., Houston, TX 77053

Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974-0556

Blohm & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY;

U.S.A. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

Centrico, Inc. (Westalia Separators), 100 Fairway Court, Northvale NJ 07647

Fast Systems, 3240 North Broadway, St. Louis, MO 63147

MMC International, 60 Inip Dr, Inwood NY 11696

Nelson Industries, Highway 51 West, Stoughton, WI 53589

PAINT—COATING—CORROSION CONTROL

Amclean Coating Removal, 12920 S.W. 99 N. Ave., Miami, FL 33176

Ameron, 201 N. Berry St., Brea, CA 92622

The Arnesen Corp., Corrosion Dynamics Div., 1100 Walnut St., Rosell, NJ 07203

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 Curie Avenue, Wallington, NJ 07057

International Paint, 6001 Antoine, Houston, TX 77292

Melvin Pierce Marine Coating, Inc., P.O. Box 93, Semmes, AL 36575

Microphor, Inc., Marine Div., 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490

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

UT Technologies Ltd., Box 31114, Robie St. RPO, Halifax Nova Scotia Canada B3K5T9

PAINT REMOVAL

LTC Americas, 101 G. Executive Dr., Sterling, VA 22170

PIPE FITTINGS/CONNECTING SYSTEMS

Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248

Stanley G. Flagg Co., 1020 W. High St., Stowe, PA 19464

PORT SERVICES

Port of Portland, 5555 N. Channel Ave., Portland, OR 97217

PROJECT TRACKING, PLANNING & MANAGEMENT

Tracking Systems of America, 8789 San Jose Blvd., Jacksonville, FL 32217

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Avondale Industries, Harvey Quick Repair, P.O. Box 116, Harvey, LA 70058

American Air Filler, P.O. Box 35690, Louisville, KY 40432

ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201-0372, USA

ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND

ABB TURBOCHARGER, INC., 1460 Livingston Avenue, N. Brunswick, NJ 08902

Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND

Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081

Brunvoll A/S, P.O. Box 370, N-6401, Molde, Norway

CWF Hamilton & Co., Ltd., P.O. Box 709, Christchurch, NEW ZEALAND

Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320

Collect Industries (Fairbanks Morse Engine Div.), 701 Lawton Ave, Beloit, WI 53511

Electro-Motive, div. General Motors, 9301 W 55th St, La Grange, IL 60525

Fincantieri, Diesel Engines Div.—GMT, Bagnoli della Rosandra 334, Trieste, ITALY

Fundaciones RICE, AV Rios Espinoza No.88, COL BENITO JUAREZ, Mazatlan,

GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420

Harbormaster Marine, Inc., 31777 Industrial Road, Livonia,

STIFFNER WELDER

Bug-O-Systems, Inc., 3003 W. Carson St., Pittsburgh, PA 15204

STUFFING BOXES

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

SURVIVAL EQUIPMENT

Parkway/Imperial, 241 Raritan Street, South Amboy, NJ 08879

Schat Watercraft, P.O. Box 7008, Newark, DE 19714

Viking Life Saving Equipment, 1625 N Miami Ave., Miami FL 33136

TANK CLEANING EQUIPMENT

Setcor, 2 Dean St., Tenafly, NJ 07670

Polarmarine, Alvsborgsgatan 37, 72 Gotteborg, SWEDEN S-414 72

TANK LEVELING INDICATORS

American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY

Bergan Tank, 3409 Gulf Breeze Pkwy, Gulfbreeze, FL 32561

ERL Marine Products div, PO Box 1026, New Albany, IN 47151-1026

Ian-Conrad Bergan, 3409 Gulf Breeze Parkway, Gulf Breeze, FL 32561

IMO Industries, Gems Sensors Division, One Cowles Rd, Plainville CT 06062

Metritape, PO Box 2366, Littleton, MA 01460-2366

MMC International, 60 Inip Dr, Inwood NY 11696

Saab Marine Electronics AB, P.O. Box 13045, S-402 51 Goteborg SWEDEN

TELECOMMUNICATIONS

Mitel, 11911 Freedom Dr., Suite 700, Reston, VA 22090

TEMPORARY FLOOR & WALL PROTECTION SYSTEMS

Megafilm, Bone Lane Industrial Estate, Newbury, Berkshire RG14 5SH ENGLAND

TESTING SERVICES

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

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

THERMAL INSULATION

The Claremont Co., Inc., 174 State St., Meriden, CT 06450

THICKNESS TESTING

Cygnus Instruments, P.O. Box 3127, Annapolis, MD 21403

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

TOOLS

San Diego Marine Hardware, 1660 Logan Avenue, San Diego, CA 92113

Tri Tool Inc., 3806 Security Park Drive, Rancho Cordova, CA 95742-6990

TORSIONAL VIBRATION SPECIALISTS

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

T.W. Spaetgens, 156 W. 8th Ave., Vancouver, BC, CANADA, V5Y 1N2

Vibranalysis Engineering Corp., 9300 Gamebird, Houston, TX 77034

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.

Baheli Marine Inc., P.O. Box 600, Lacombe, LA 70445

Jack Faulkner, 2419 Caddy Lane, Flossmoor IL 60422

TURBOCHARGERS

ABB Turbocharger Co., 1460 Livingston Ave., North Brunswick, NJ 08902

ULTRASONIC TESTING

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

VACUUM TOILET SYSTEM

Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111

Fast Systems, Inc., 3240 N. Broadway, St. Louis, MO 63147

Jered Brown Bros., 56 S. Squirrel Rd., Auburn Hills, MI 48326

Jets Vacuum Sewage System, P.O. Box 14, N-6060 Hareid, NORWAY.

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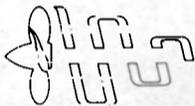
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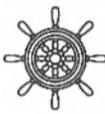
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Denison Hydraulics, Marysville, Ohio, offers a new 20-page technical bulletin describing the company's new variable displacement, open loop, totally metric P260 hydraulic axial piston pump for off-highway vehicles, in-plant machines and marine applications.

The technical brochure provides an extensive explanation of the P260's operating features and specifications. Control options, fluid recommendations, performance curves, and installation drawings are included in the brochure's narrative and illustrations.

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To find out more about the brochure, contact **Rick Rockwell**, Denison Hydraulics, 14249 Industrial Parkway, Marysville, Ohio 43040, tel: (513) 644-3915.

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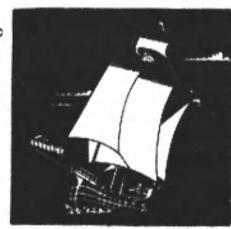
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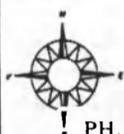
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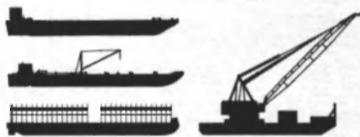
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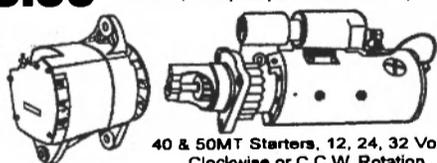
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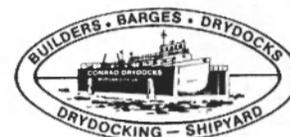
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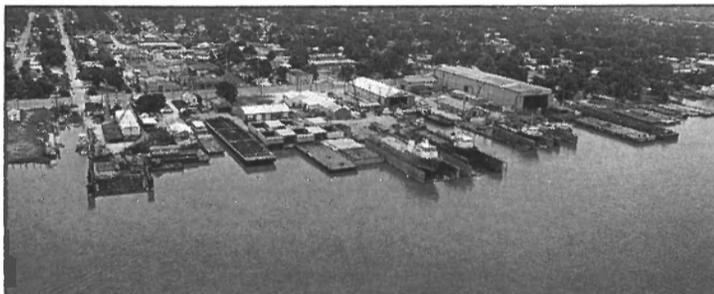
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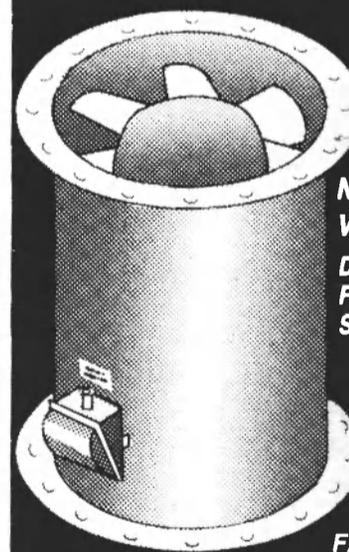


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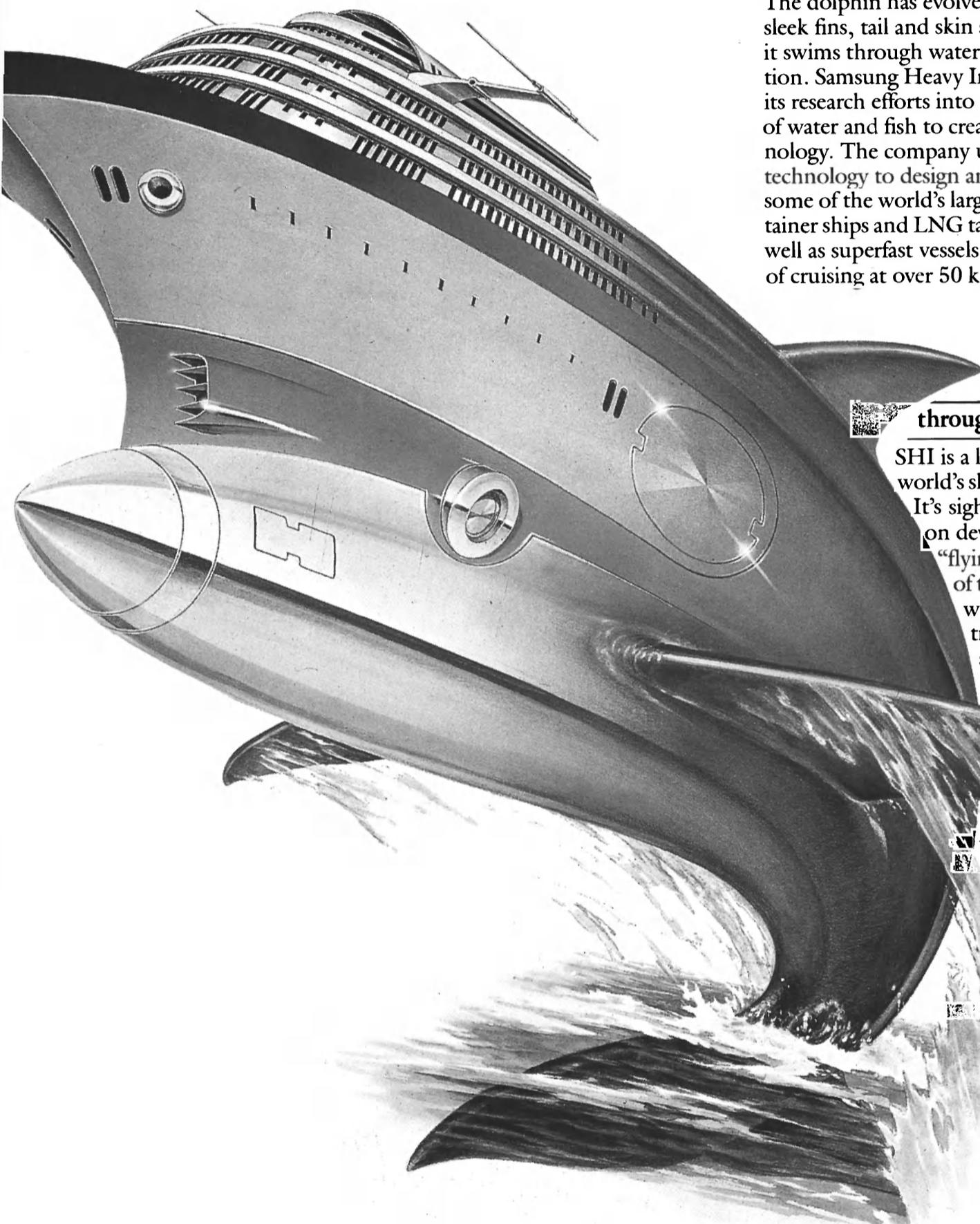
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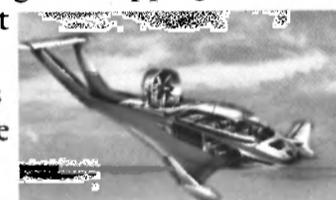


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