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AND
ENGINEERING NEWS

OUTSTANDING OCEANGOING SHIPS OF 1992

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NAVAL TECHNOLOGY & SHIPBUILDING

DECEMBER 1992 ISSUE

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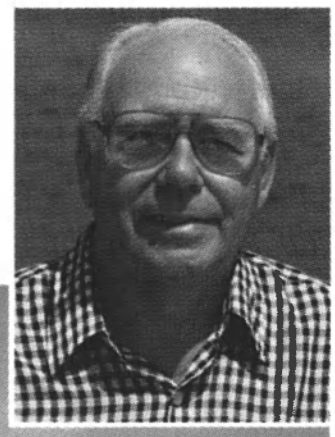

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Circle 272 on Reader Service Card

OUTLOOK FOR REPAIR AND MODERNIZATION OF U.S. NAVY SHIPS

NEW 1993 EDITION

Report No. 7121 — Now Available

IMA has just completed a detailed assessment of the U.S. Navy ship maintenance and modernization market. The new, 181 page report provides details needed for long range planning and market positioning in the annual $4.2 billion Navy ship repair business. In the report is up-to-date information vital to keeping abreast of the rapidly changing Navy business environment.

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Report No. 7121 is available for $575. The report will be sent the day the order is received.
Purchasers of the report will receive an update in March 1993 as part of the initial purchase price.

To order please contact:

IMA Associates, Inc. - 600 New Hampshire Ave., N.W. - Suite 140 - Washington, DC 20037 USA
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Telephone or telefax orders will be accepted

ON THE COVER

The "Wels" is a 23,400-dwt, double-hull tanker built by Kiel, Germany-based Lindenau. Turn to page 14 to read about 1992's Outstanding Oceangoing Ships. The inset picture is of the Westamarin Foilcat 2900, an MTU - powered fast ferry (see story, page 38).

INSIDE:

Carrier Corp. Buys Seacold Factory For $19 Million

Carrier Corporation recently bought the Seacold container refrigeration machinery factory from Sea Containers of Singapore. The purchase price was $19 million.

Carrier Corporation indicated that it has been looking to expand the manufacturing base of its subsidiary Carrier Transicold in Southeast Asia for quite awhile.

Carrier Corporation is a subsidiary of United Technologies Corporation, which produces a broad range of high technology products and support services.

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Editorial and Executive Offices
118 East 25th Street, New York, NY 10010
(212) 477-6700 • ITT Telex: 424768 MARINTI
Telefax: (212) 254-6271

Publishers:	CHARLES P. O'MALLEY JOHN E. O'MALLEY JOHN C. O'MALLEY
Editorial Director:	CHARLES P. O'MALLEY
Editor:	JOHN SNYDER
Managing Editor:	GREG TRAUTHWEIN
News Editor:	MELANIE A. QUICK
Technical Editor:	M. JAMES SINGLETON III
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Production Manager:	CHRISTINE T. MISKIEWICZ
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Regional Sales Manager:	DANIEL A. ARNOLD
Regional Sales Manager:	LUCIA ANNUNZIATA
Regional Sales Manager:	JOANNE GAMBERT

Advertising Circulation and Sales Offices
118 East 25th Street, New York, NY 10010
Telephone (212)477-6700

REPRESENTATIVES

U. S. Gulf States — MR. JAMES N. McCLINTOCK
Wheelhouse One Building
634 Village Lane North, Suite 205
Mandeville, LA 70448
Telephone: (504) 626-7990
Telefax: (504) 624-5163

Scandinavia — MR. STEPHAN R. G. ORN
AB Stephan R.G. Orn
Box 184, S-27100 Ystad, Sweden
Telephone: 46 411-18400
Telefax: 46 411 10531

United Kingdom — MR.MICHAEL J. DAMSELL
Euromedia Ltd.
P.O. Box 122
Hayward's Heath
West Sussex RH16 1YF, ENGLAND
Telephone:0444 417360
Telefax:0444 417360

Italy — MR. VITTORIO F. NEGRONE
Ediconsult Internazionale
Piazza Fontane Marose,
3-16123 Genova, Italy
Telephone: (010) 583520
Telefax: (010) 566578
Telex: 211197 EDINT I

Germany Switzerland — MR.THEO ANTHONY
AM Lerchenberg 22
D-2112 Jestenburg bei
Hamburg, Germany
Telephone: 4183-5541
Fax: 4183-5543

Korea — MR.C.H. PARK
Far East Marketing Inc.
Rm. 508, Chungmu Building
10, 2-ka, Pil-dong, Chung ku.
Seoul, Korea
Telephone: (02) 265 - 5043
Fax: (02) 277 - 5148

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Circle 233 on Reader Service Card

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Kvaerner Eureka To Design, Supply Cargo Handling System For Product Carrier

One of Norway's leading equipment specialists, Kvaerner Eureka AS, recently signed a contract to design and supply the complete cargo handling system for a 28,500-dwt product carrier being built in St. Petersburg, the Commonwealth of Independent States.

The vessel is currently under construction at the Admiralty Shipyard in St. Petersburg and is being built for Inter Maritime Management SA of Switzerland. The company also holds an option for a second vessel.

This is reported to be the first time that Kvaerner Eureka has secured a complete turnkey contract for a tanker. The company will design and supply cargo pumps, ballast pumps, powerpacks/cargo heaters, totally computerized cargo control system, hydraulic piping, cargo piping and inert gas system.

The vessel is scheduled to be delivered in December 1993 and will feature 18 coated cargo tanks, each equipped with a Kvaerner Eureka cargo pump.

This contract follows another contract for liquid cargo handling equipment for a vessel being built in Korea.

For more information on the products supplied by Kvaerner Eureka,

Circle 13 on Reader Service Card

Oceandril Forms New Rig Repair Company

Oceandril, Inc. has announced the formation of a new service company specializing in the repair and maintenance of Marathon LeTourneau manufactured offshore drilling rigs and equipment.

The Vicksburg, Miss.-based company, Vicksburg Marine International, offers a team of mechanical and electrical technicians, all of whom have over 20 years experience in their fields. **Bud Smith**, vice president of the new entity, and **Jean Callen** are available to assist customers in all aspect of rig and equipment service, parts and shop repair of electrical and mechanical components.

Dupuis Named Vice President And General Manager, CIV

Robert E. Dupuis has been named vice president and general manager of COMSAT International Ventures (CIV). The announcement was made by COMSAT Corp. president and CEO **Bruce L. Crockett**.

Mr. **Dupuis** will be responsible for developing joint ventures outside the U.S. with telecommunications companies and administrations to provide digital communications services for private-line international and domestic long distance markets.

CIV currently operates venture partnerships in six countries: Argentina, Bolivia, Chile, Columbia, Guatemala and Turkey. The unit plans to begin operations in several other countries in 1993.

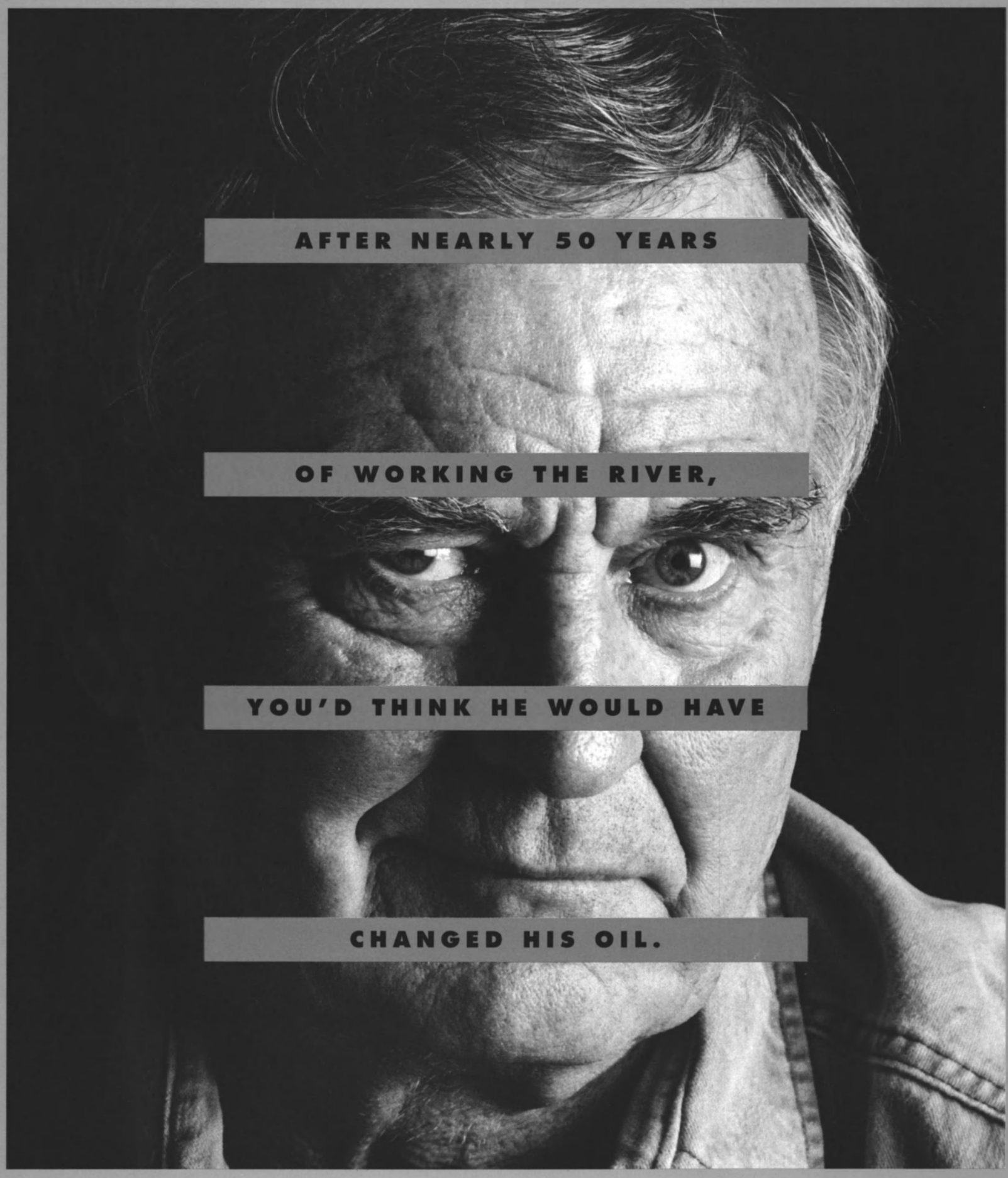
As part of a restructuring, COMSAT recently announced that CIV would become a stand-alone subsidiary managed in close association with COMSAT's international communications interests.

Ingersoll-Rand, Dresser Industries Form Joint Venture

Ingersoll-Rand and Dresser Industries Inc. announced the formation of a new company through a joint venture.

The company, to be called Ingersoll-Dresser Pump Co., was originally proposed in May of 1991. The Department of Justice recently approved the joint venture.

The company will include both partners' domestic pump operations. It will, however, exclude Dresser's operations in Britain. Both Ingersoll and Dresser had total combined sales of about $900 million in 1991. With the formation of the new company, Ingersoll and Dresser plan to employ approximately 8,000.



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LUBRICANTS

Circle 248 on Reader Service Card

Vulkan Group Launches Eighth Containership Ordered By Conti Reederei

The eighth container vessel of the BV 1600-class ordered by Conti Reederei from the Vulkan Group, the Contship France, was recently launched by Schichau Seebeckwerft AG, of Bremerhaven, Germany, a member of the group.

The Contship France is 535.8 feet in length, has a 90.2-foot breadth and a maximum draught of 35 feet. The 23,094-dwt containership will be powered by a BV/MAN B&W 6L60MC diesel engine generating 10,440 kW and driving the ship to a speed of 18.3 knots.

The vessel will have a total capacity of 1,597 20-foot equivalent unit (teu) containers and be classed by Germanischer Lloyd.

After the ship's scheduled delivery in mid-February, 1993, she will be the sixth vessel in Conti Reederei's fleet to be longterm chartered to Contship Container Lines, Ipswich, U.K.

The Contship France will be operating within the frame of the Contship Group for Eagle Container Lines on the Europe to Australia and Far East route.

The ship is to be managed by NSB Niederelbe Schiffahrtsgesellschaft GmbH & Company, KG, Buxtehude, Germany, a subsidiary of Bremer Vulkan Verbund AG.

New Double-Hulled Texaco Tanker To Be Named 'Star Ohio'

Texaco, Inc., White Plains, N.Y., recently announced that its wholly-owned subsidiary, Texaco Panama, Inc., has taken delivery of a new double-hulled motor tanker.

The 900-foot vessel, which can carry up to one million barrels of oil, is named the Star Ohio, after the company's historic World War II tanker Ohio that was vital to resupplying the island of Malta.

The vessel was built at Samsung's Koje, Korea, shipyard to ABS standards, including ice-strengthening.

Texaco intends to operate the vessel in worldwide trading, carrying crude oil for the company and its affiliates.

Weezie Davidson, wife of Texaco, Inc., vice president and corporate secretary **Carl B. Davidson**, christened the Star Ohio during ceremonies in Korea.

Texaco's international marine fleet comprises 33 owned and term-chartered ocean-going tankers, totalling about 4.8 million deadweight tons.

Lips Receives P&O Propeller Systems Order For New Superliner

Lips B.V., of the Netherlands, has been selected by P&O Cruises to supply the main propeller system, transverse thrusters and associated control systems for its 67,000-gt, luxury superliner being built at Meyer Werft shipyard, Papenburg, Germany.

The new P&O liner, which will replace the company's cruise ship Canberra, will be fitted with two Lips 4C18-type, highly-skewed, controllable pitch propellers.

Each of the 19-foot diameter screws will be engineered to absorb 25 MW in an installation designed to ensure a speed of approximately 24 knots.

In addition to the ship's main propellers, Lips will also supply three variable pitch bow thrusters and one stern thruster unit, each generating 1,550 kW.

The high degree of maneuverability that this extensive thruster installation will provide the ship will be complemented by a Lipsstick single-lever control unit, which will simultaneously control the liner's main propellers, rudders and thrusters.

All of these units will be linked through a Lipstronic microprocessor-based control system.

The 1,975-passenger P&O superliner is scheduled to join the British cruise fleet in the spring of 1995.

Kvaerner Warnow Werft Receives First Order For $33.6 Million

Norwegian offshore, shipping and engineering group Kvaerner A.S., recently announced that Kvaerner Warnow Werft GmbH has received its first order since Kvaerner A.S. acquired the German shipyard on October 1, 1992.

Kvaerner Warnow received a 200-million-Krone ($33.6-million) order to build a 19,000-dwt containership for German shipowner Hans Peterson & Soehne.

According to Kvaerner, construction of the new vessel will begin immediately, with completion scheduled for the end of September, 1993. The 547.9-foot container ship will have a beam of 82 feet and a container capacity of 1,400 teu.

With the latest order, the shipyard now has a total of eight new vessels on order, Kvaerner reported.

Kockumation, Hitachi And Maersk Data Sign Cooperation Agreement

A cooperation agreement covering the possible exchange and development of marine products was recently signed by Kockumation AB, the Swedish on-board marine computer systems specialists, Hitachi Zosen Information Systems Co. Ltd, a subsidiary of the Hitachi Zosen Corporation, and Maersk Data, a member of the A.P. Moller Group of Denmark.

The agreement specifically covers loading systems. Historically, Maersk Data and Hitachi Zosen have always had a close relationship, particularly in the CAD/CAM area.

Oceandril, Oceaneering Form Agreement To Manage And Market Jackup Rig

Following the recent purchase of the jackup rig Marine VIII by the Norwegian company Brobekk a.s., Oceandril, Inc. and Oceaneering Production Systems, Inc. have announced a joint agreement to manage and market the offshore rig. Oceandril will provide crews to maintain and ultimately operate the rig, while Oceaneering will provide engineering and marketing expertise. The "Production Partner" is a Baker Marine-designed, 1978-built, 250-foot water depth jackup presently located in Sabine Pass, Texas anchorage area.

Oceandril is a privately owned corporation based in Texas and provides offshore rig management and brokerage services to the energy service industry.

Brobekk is a Norwegian investment company dedicated to investments/merchant banking activities within the offshore oil industry.

Oceaneering offers Mobile Offshore Production Systems (MOPS) and subsea production services to operators around the world.

Oceaneering provides operators with leased production systems on tankers, semisubmersibles and jackups to meet customer requirements.

The company also offers project management for the conversion of operator-owned units and engineering for field development.

Adm. Kime Elected President Of SNAME

U.S. Coast Guard Commandant Adm. **William Kime** was elected to the position of president of the Society of Naval Architects and Marine Engineers (SNAME) at the association's recent annual meeting in New York City.

Adm. **Kime** is the first Coast Guard officer ever elected to this position. He will begin serving his two-year term on January 1, 1993, succeeding **Ronald K. Kiss**, assistant secretary of the Navy for ships.

Adm. **Kime** became commandant of the Coast Guard in 1990 and also received SNAME's Vice Adm. "Jerry" Land medal for outstanding accomplishment in the marine field. He is one of 123 SNAME fellows.

Trinity Marine Expands Operations By Acquiring Eastern Shipyards

Trinity Industries, Inc., Dallas, Texas, added a new shipyard to its Gulfport, Miss.-based Trinity Marine Group.

The Trinity Marine Group acquired certain assets of Eastern Shipyards, Inc. The new facility will be operated as Trinity Marine-Panama City.

The announcement was made jointly by **John Dane III**, president of the Trinity Marine Group, and **Brian R. D'Isernia**, president of Eastern Shipyards, Inc.

Trinity plans to seek shipbuilding opportunities, both domestic and foreign, for the types of vessels which Eastern Shipyards is capable of building. Most recently, the yard built a 400-foot sulphur ship for Freeport-McMoran. The workforce is also expected to increase as work is added. As a result of the acquisition, the yard will maintain a skeleton management team which will maintain and review the yard's capabilities.

Some of the existing personnel will continue to be employed by Eastern Shipyards, which will continue to operate the Nelson Street Yard as a repair yard specializing in ship conversion as a general steel fabrication facility.

For more information,

Circle 7 on Reader Service Card

Blount Industries Signs Contract To Build An 800-Passenger Vessel

Blount Industries, Inc. of Warren, R.I., recently signed a contract to construct an 800-passenger, 130-foot Ellis Island-class vessel for Circle Line Statue of Liberty Ferry, Inc. of New York City. Designed by **Robert Simons**, this ferry will operate between the Battery, Ellis Island and the Statue of Liberty.

The contract is for a third sister ship to the Miss Ellis Island and Miss New Jersey built by Blount in 1991. Blount has constructed a total of seven ferry vessels for Circle Line of New York over the last 40 years. The new vessel is scheduled to be completed by June 15, 1993.

For complete information on the construction capabilities of Blount Industries,

Circle 8 on Reader Service Card

German & Milne Receives Contract For Portable Engine Analysis System

The president of German & Milne, Inc., Houston, Texas, has received a contract from the Kuwaiti Oil Tanker Company (KOTC) to provide Carma engine analysis service to 10 of KOTC's vessels. The one-year contract followed the completion of a field trial of the Carma system aboard the KOTC vessel "Hadiyah" earlier this year. The system reportedly demonstrated a potential for significant savings in fuel, operational and maintenance costs.

German & Milne says that its Carma engine analysis system, only recently introduced into the marine industry, has already been adopted by a number of leading shipowners and operators. Carma is designed for shipboard or on-site analysis of large reciprocating engines under 3,000 rpm.

Pressure, ultrasonic and vibration readings from each cylinder are acquired in unison. By comparing one cylinder to another, and by analyzing the chain of events, Carma operators can determine the health of the cylinder and of the entire engine and recommend repairs or adjustments to the crew.

Fuel costs reportedly can average up to $200/hour. German & Milne engineers have identified the potential for five to 10 percent gain on marine engines surveyed, both propulsion units and generators. The system also provides additional benefits in reduced exhaust emissions.

For complete information describing the Carma system,

Circle 68 on Reader Service Card

Kvaerner Brug To Supply Innovative 'Rain Shelter' For Hatchless Boxships

Norasia Line's four "hatchless" containerships recently ordered from the Kiel yard of Germany's HDW will feature a cargo protection innovation from the German member of the Kvaerner Eureka worldwide family of marine equipment specialists—Kvaerner Brug (Deutschland) GmbH.

All four of the 2,780-TEU vessels incorporate HDW's hatchless containership concept, which is designed to maximize cargo handling efficiency. Only holds one and two are fitted with pontoon-type covers, as these areas will be used for the carriage of hazardous cargoes.

Unlike operators of other hatchless containerships, Norasia has decided to use a unique "rain shelter" design from Kvaerner Brug rather than high-capacity bilge pumps to discharge rain water.

The four Norasia containerships will each be fitted with 12 lightweight, corrugated steel shelters, which will protect the cargo from heavy tropical rain, as well as provide the ship with some sort of stability control.

Each shelter will be secured by quick-acting cleats and rest on the transverse cell guides. The cell guides will extend to the top container in the stack.

The Norasia containerships at HDW are reported to be the first vessels of this type to be fitted with such a system.

For more information detailing the "rain shelters" from Kvaerner Brug,

Circle 3 on Reader Service Card

Curt Appointed Manager Of Mobil's U.S. Fleet

Robert P. Curt was recently appointed manager of Mobil Oil Corporation's U.S. fleet.

A graduate of the U.S. Merchant Marine Academy at Kings Point, N.Y., Mr. **Curt** has been with Mobil since 1977. He has been manager of chartering for Mobil Shipping and Transportation Co. and manager of fleet engineering services in the international fleet. He has also held positions in the supply and distribution department.

Robert P.Curt

In his new position, Mr. **Curt** will be responsible for Mobil's nationwide waterborne transportation of crude oil and petroleum products. Mobil owns and operates a fleet of over 40 deep sea, coastal and inland vessels.

Glosten Wins $2.1 Million U.S. Ferry Design Contract

The Glosten Associates, Inc., a Seattle-based naval architecture and marine engineering firm, has been awarded a $2.1 million contract to develop owner requirements for a new $75 million oceangoing ferry for the Alaska Marine Highway System (AMHS). Scheduled for delivery in the spring of 1996, the vessel will be the first ocean-class passenger/vehicle ship to be built in the U.S. in the past 30 years, and the first new construction for AMHS since 1977.

According to the vice president and director of engineering for Glosten, **J. Thomas Bringloe**, "The new ferry will have several different missions, including servicing ports with different loading configurations, crossing the Gulf of Alaska and functioning as a staging platform for major emergencies."

The new ferry design will incorporate a unique elevator and turntable system—similar to that currently used by the M/V Tustumena—to load and unload autos from conventional docks. The new ferry will also be ocean certified for crossing the Gulf of Alaska—widely recognized as one of the roughest bodies of water in the world. The expanded capabilities of the new vessel will allow AMHS to expand service across the Gulf of Alaska between Seward and Southeast Alaska ports.

While design studies are just getting underway, a ship about the size of AMHS's M/V Taku is anticipated, with a length of 380 feet and a beam of 85 feet. The new ferry will have a capacity for 700 passengers for day trips, 500 passengers on overnight runs and 105 automobiles.

The state of Alaska plans to use a procurement method in which a shipbuilder will be selected to propose final contract plans to build the vessel.

Other subconsultants include Interior Design International of Seattle and food service planners William Caruso & Associates, Inc. of Lakewood, Colo.

Perry To Distribute Underwater Laser Line Scan System

Perry Tritech recently signed an agreement with Westinghouse Electric Corporation to become the exclusive European distributor of the Westinghouse Underwater Laser Line Scan System. Perry Tritech, with offices in Aberdeen, Scotland, and Jupiter, Fla., will be responsible to Westinghouse Underwater Laser Systems of San Diego, Calif., for all aspects of product distribution in Europe including marketing, sales, technical support, spare parts and field service.

The SM 2000 Laser Line Scan System offers a quantum leap in subsea imaging technology providing the ability to produce clear, high resolution panoramic seabed images at altitudes of up to 40 meters from the bottom. The SM 2000 also offers a field of view of 10 to 70 degrees and a survey swath from four to 45 meters wide and can be used for both military and commercial applications.

For more information,

Circle 17 on Reader Service Card

Pan-United Shipyard Receives Orders Totaling $18.79 Million

Pan-United Shipyard of Tuas, Singapore, has announced the award of two new orders worth a total of about $18.79 million.

The first contract is for a series of highly-maneuverable tugboats for the Port of Singapore Authority. The tugboats will be 91.87 feet long an built to a design by Conan Wu and Associates. The tugs will have a beam of 31.5 feet and a depth of 13.1 feet with a speed of 10 knots and a bollard pull of 30 tons. Each of the tugs will be fitted with Stork-Wartsila 6FHD240 diesel engines driving a pair of Aquamaster US 1201/2500 steerable rudder propellers. Equipped with bow and stern fenders, a 35-ton towing hook and a five-ton tow winch/anchor windlass, the vessels will be suitable for towing and pushing purposes.

All three vessels are scheduled for delivery in the late spring or early summer of 1993.

The second contract involves the design, construction and delivery of an integrated 8,000-dwt specialized cement pusher barge for an overseas client.

The pusher barge, will be constructed so that the pusher can remain connected when the barge is being loaded and unloaded. The pusher is expected to be completed during the first half of 1993 and will measure 101.7 feet in length, have a beam of 32.8 feet and a depth of 16.4 feet. Propulsion will be by twin Yanmar 6N280UN diesels with Yanmar YX-2400C reverse reduction gear, each developing 2,000 hp at 720/234 rpm.

The cement barge will have a length of 288.7 feet, a beam of 77.1 feet and a draft of 18 feet. The capacity of the barge will be 8,000 dwt with a hold capacity of 6,300 cubic meters. The speed of the pusher barge when connected and fully loaded will be more than eight knots.

For more information on the capabilities and facilities of Pan-United Shipyard,

Circle 29 on Reader Service Card

Atlantic & Pacific Marine Services Formed To Offer Ship Repair In Singapore

The board of directors of Atlantic & Pacific Marine Services Pte Ltd. has announced the formation and commencement of operations of its new marine services company. The company's primary objective will be to provide a full range of high quality and reliable repair services to the marine industry including naval and commercial customers. Additionally, the company will engage in industrial and petrochemical work.

The company's operations will be headquartered in the Tuas district of Singapore adjacent to the major shipbuilding and ship repair facilities in the country.

The first major contract for the company has been confirmed and will entail extensive repairs to a U.S.-flag VLCC. The company's operations will be conducted by **Bob King**, managing director.

The company's board of directors includes international shipbuilding and ship repair executives with extensive experience in all segments of the business.

Alan Nierenberg is the chairman of the board and has served as president and general manager of major shipbuilding companies in the U.S.

For further information on the services provided by Atlantic & Pacific Marine Services,

Circle 48 on Reader Service Card

Jaxport Announces Plans To Purchase Land For Port's Third Ship Terminal

The Jacksonville Port Authority (Jaxport) recently voted to purchase three large tracts of land on Dames Point totalling more than 468 acres, upon which it will build Jacksonville's third public ship terminal. The cost of the land was about $14.4 million.

Jaxport already owns 30 acres in the area and will offer to purchase 80 additional acres from individual Dames Point residents following the completion of appraisals.

When the final 80 acres are acquired, Jaxport has indicated that it will own approximately 579 acres immediately adjacent to its Blount Island Marine Terminal.

The property, which is on deep water and slated for port development under the city's comprehensive master plan, is easily accessible by rail and highway.

The new facility will complement Jaxport's existing 1,040-acre port terminal complex, consisting of Blount Island and Talleyrand Docks & Terminals.

G.E. Kurz Receives Robert L. Hague Merchant Marine Award

Gerhard E. Kurz, president of Mobil Shipping and Transportation Company, was the recipient of the American Legion's Distinguished Service Citation at the recent American Legion Merchant Marine Industries' Post No. 1242 annual awards dinner in New York.

The presentation was made by **Jack Caffrey**, post commander and **Bill Horan**, former post commander.

The annual award is given to a person or company that has been judged to have made a significant contribution to the American Merchant Marine in the past calendar year.

Show at awards dinner from left to right: Jack Caffrey, Gerhard E. Kurz and Bill Horan.

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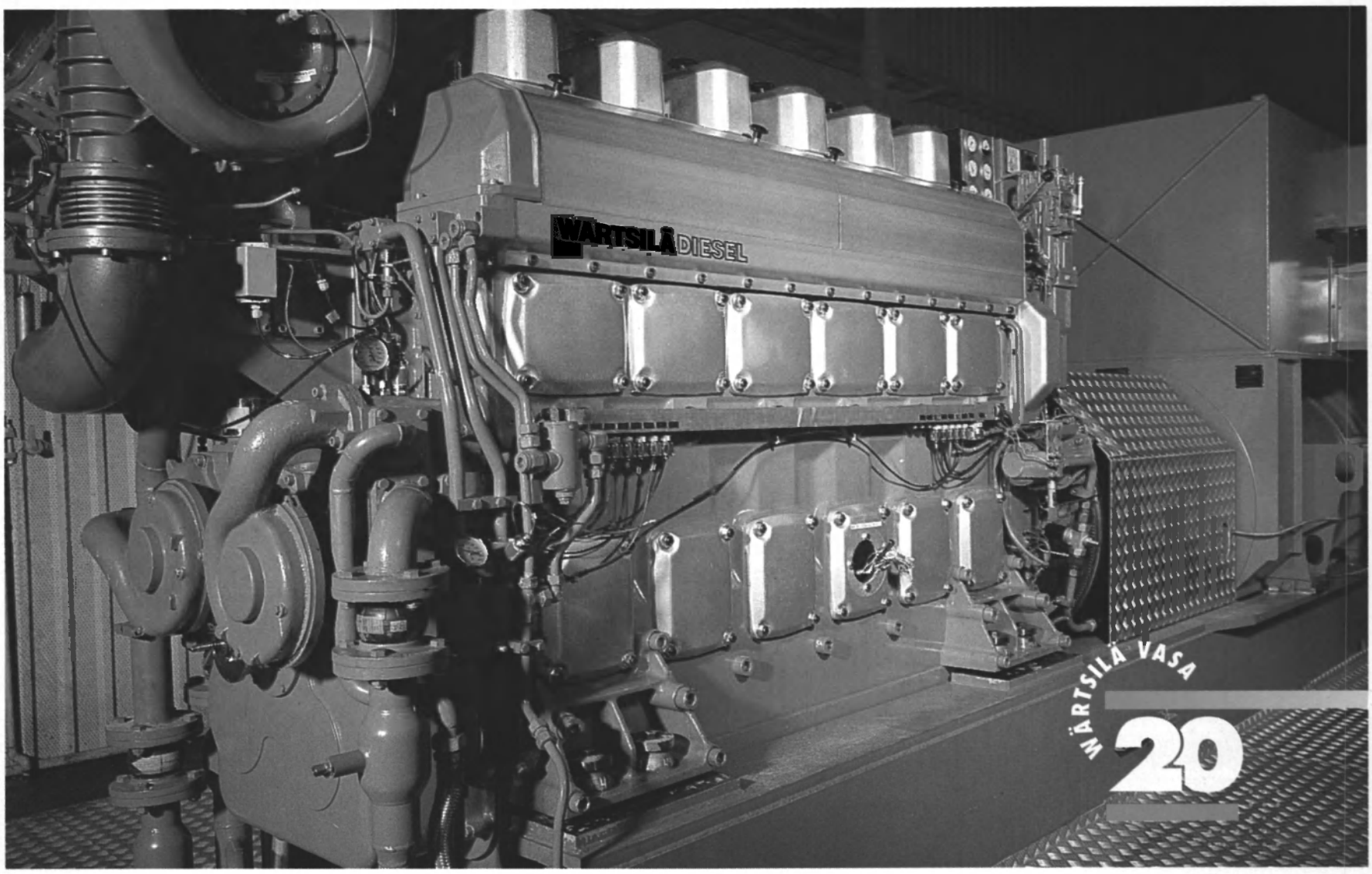

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The Wärtsilä Vasa 20 auxiliary engine is a unique combination of compact size, modern design and top performance. The output range of the 4, 6 and 9-cylinder units is 520–1485 kW within the speed range of 720–1000 rpm, making the Vasa 20 suitable for a wide variety of vessels.

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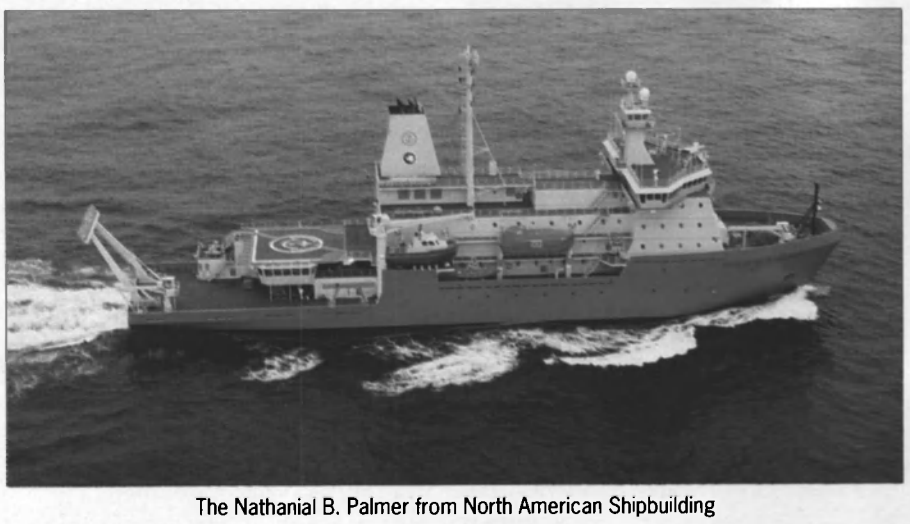
Circle 254 on Reader Service Card

The Western Regent from Ulstein

The Futura from Kvaerner-Masa



The Nathanial B. Palmer from North American Shipbuilding

OUTSTANDING SHIPS

This year's portfolio of outstanding oceangoing ships includes a diverse lot, each one boasting its own distinc-function or design. From the ice breaking research vessel, Nathanial B. Palmer built by North American Shipbuilding, to the ore carrier Bergeland constructed by Hyundai Heavy Industries, to the aircraft carrier George Washington from Newport News Shipbuilding, the list includes many fine vessels from yards around the world.

Due credit is given to the yards and equipment suppliers which helped create the best oceangoing ships of 1992.

PATRIOT

Samsung Heavy Industries
Circle 85 on Reader Service Card

Delivered in January 1992 to Conoco Shipping Company of Houston, the M/T Patriot is a 95,000-dwt, double-hulled crude oil tanker with an overall length of 243 meters, a beam of 42 meters and a draft of 12.2 meters.

Propelled by a Sulzer 6RTA62 engine, which has a total of 15,000 bhp at 104 rpm, the Patriot has an average speed of 15 knots.

Additionally outfitted with Nil thrusters, thruster engines and reduction gears, as well as an (Ni-Al-Br) fixed-pitch propeller, the vessel has a cruising range of approximately 19,000 nautical miles.

To ensure minimized wave resistance with optimized bulbous bow and lower viscous resistance, numerical analysis, such as flow-line visualization, pressure distribution around the hull and wave pattern analysis were carried out to ensure optimum hull form.

To enhance performance, the ship was equipped with: three generator sets, capable of 720 kW, and a 150 kW emergency generator; an SSHI B&W 6L23/30 engine, rated at 1,060 PS at 720 rpm; engine controls operated remotely from the bridge and from the engine control room; electro-hydraulic steering controls, two-RAM, four-cylinder type; and two vertical water tube type auxiliary boilers capable of producing 30,000 kg/h x 16 bar.

Deck machinery consists of two electro-hydraulically driven windlasses and eight winches.

The crude oil tanker, which is deployed in the Gulf of Mexico, is classed ABS, +A1, (**E**), "Oil Carrier," +AMS, +ACCU, and runs under the Liberian flag.

Accommodations on the Patriot are designed and arranged for a complement of 31 in single cabins with private shower and toilet facilities.

The firefighting system is a centralized CO_2 type, for engine room and cargo pump room, and foam for the cargo deck area.

The hull was coated with a tin-free, self-polishing A/F paint to maximize both environmental and hull protection.

PATRIOT
Equipment List

Main engines	Hyundai/Sulzer
Propeller	Hyundai
Thruster	Nil
Thruster engines	Nil
Generator engines	SSHI B&W
Generator	Heeco
Reduction gears	Nil
Steering gear	Dongmyung
Deck machinery	Kocks
Coatings	Ipk & Hempel
VHF & SSB radio	J.R.C.
Radar	Sait
Compass	Anschutz
Loran	Furuno
Autopilot	Anschutz
Pump	Naniwa
Joiner bulkhead linings/partitions	BU-IL

The Hanjin Osaka from Hanjin Heavy Industries

The Patriot from Samsung Heavy Industries

OCEANGOING OF 1992

The Mastera from Daewoo Shipbuilding


The Bergeland from Hyundai Heavy Industries

For free information on the products and services of the following shipyards mentioned in the Outstanding Oceangoing Ships of 1992 story, circle the corresponding number on the Reader Service Card.

Shipyard	Ship(Name/Type)	Reader Service Number
Daewoo Shipbuilding	Mastera/Tanker	95
Hanjin Heavy Industries	Hanjin Osaka/Container Ship	78
Hitachi Zosen	Otello/Car-Truck Carrier	79
Hyundai Heavy Industries	Bergeland/Ore Carrier	80
Kvaerner-Masa Shipyards	Futura/Tanker	81
NASSCO	R.J. Pfeiffer/Container Ship	82
Newport News Shipbuilding	George Washington/Aircraft Carrier	83
North American Shipbuilding	Nathaniel B. Palmer/Ice Breaking Research Vessel	84
Samsung Heavy Industries	Patriot/Tanker	85
Ulstein	Western Regent/Seismic Research Vessel	86

R.J. PFEIFFER

NASSCO

Circle 82 on Reader Service Card

The M/V R.J. Pfeiffer was constructed by National Steel and Shipbuilding Company (NASSCO) of San Diego and designed in collaboration with Odense Steelshipyard of Denmark. The Hawaii II class containership, built for Matson Navigation, represents the first contract for a large, oceangoing commercial ship to be awarded to any U.S. Shipyard since 1984.

The 21,500-dwt R.J. Pfeiffer is designed for unrestricted, worldwide fast container service, and will be used on Matson's Pacific coast-Hawaii route. The vessel has a draft of 34.5 feet and a speed, at 90 percent MCR, of 22.5 knots. Propelled by a MAN B&W 8L80MC, slow speed, single screw main diesel engine, with two B&W type NA-70 turbochargers, the ship is capable of producing 33,680 hp.

MAN B&W licensee Kawasaki built the two stroke, eight-cylinder engine, which stands nearly four stories high and weighs 992 tons. Ulstein Maritime provided the thrusters. The five-blade, moderately skewed, fixed pitch propeller, which measures 7.72 m in diameter, was manufactured by Thyssen Rheinstahl, which also supplied the ship's shafting.

Wartsila Vasa was chosen to provide the ship's three 2,000-kW, three-phase service diesel generators, as well as the 500 kW backup unit.

The auxiliary boiler and exhaust economizer both come from Senior Green, the former being a 7,500 lb/hr, 102 PSIG unit, the latter a 5,800 lb/hr, 102 PSIG unit.

The steering gear, supplied by Anschutz of America (Frydenbo), is an electro-hydraulic, four cylinder ram type, The 1,600 hp electro-hydraulic bow thruster has a variable pitch impeller and was provided by Ulstein Maritime.

Norcontrols provided the engine controls, which allow remote control and monitoring of machinery. Propulsion machinery can also be controlled from the bridge.

Navigation equipment, primarily supplied by Sperry Marine, Inc. and Raytheon, includes: radar/collision avoidance system; gyro compass; echo sounder; doppler speed log; satellite navigation system; Loran C; and a radio direction finder.


The R.J. Pfeiffer from NASSCO

The Otello from Hitachi Zosen


The George Washington from Newport News Shipbuilding

Mackay Communications supplied the autopilot, as well as the VHF and SSB radio equipment.

The containership, which measures more than 713 feet long and 105 feet wide, has a design capacity of 1,650 TFEU (24-foot-equivalent units) or 1,400 TFEU plus 125, 40-foot auto frames (FAFs). A maximum of 1,910 TFEU (or 1,650 TFEU plus 130 FAFs) may be achieved through four-tier-on-deck container stacking.

Refrigerated containers may be stowed in the holds and on five of 16 on-deck container rows. Holds are closed by watertight pontoon hatches, designed by MacGregor Navire, for stacking on adjacent covers. A water fire extinguishing system covers the deck and accommodations, while a CO_2 fire extinguishing system is in all cargo and machinery spaces.

The deck equipment from Ulstein Norwinch features two horizontal shaft type anchors and mooring windlasses mounted on separate bed plates.

The anchors are two lightweight AC-14 type. Other equipment includes: centrifugal pumps by Weir Pumps, Ltd.; rotary pumps by McKenna Eng. & Equipment; air conditioning and s/s reefer by York; HVAC and machinery fans by Buffalo Forge; joiners by Hopeman Brothers; switchboards by Point Eight Power Inc.; elevator by Jered Brown; electric motors by Reliance; heat exchangers by ITT Standard; and purifiers by Alfa-Laval.

The ship was finished using coatings from International Paint, with Ameron providing the supplies for the bottom coating.

R.J. PFEIFFER
Equipment List

Main engine	MAN B&W
Propeller	Thyssen Rheinstahl
Thrusters	Ulstein Maritime
Generator engines	Wartsila Vasa
Generator	Wartsila Vasa
Engine controls	Norcontrols
Steering controls	Anschutz of America (Frydenbo)
Deck machinery	Ulstein/Norwinch
Shafting	Thyssen Rheinstahl
Coatings	International Paint and Ameron
VHF and SSB radios	Mackay Communications
Radar	Sperry Marine Inc.
Loran	Raytheon Service Co.
Autopilot	Mackay Communications
Centrifugal pump	Weir Pumps
Rotary pump	McKenna Eng. & Equipment
Air conditioning	York
S/S Reefer	York
HVAC and Machinery fans	Buffalo Forge
Joiner	Hopeman Brothers
Switchboards	Point Eight Power Inc.
Elevator	Jered Brown
Electric motors	Reliance
Heat exchangers	ITT Standard
Purifiers	Alfa-Laval
Lifeboats	Schat Watercraft

WESTERN REGENT

Ulstein Verft
Circle 86 on Reader Service Card

The UT 747 Seismic Research Vessel, designed by Ulstein International AS and built in Ulstein Verft yard no. 231, was delivered to the Western Geophysical Company, a subsidiary of Western Atlas International, Inc., of the U.S.

Powered by a centralized diesel electric power plant from Bergen Diesel, the vessel's propulsion and compressors are all electrically driven, providing a high level of availability and redundancy. The Western Regent also features four-blade screwed, CP propellers, driven through a single input, single output reduction gearbox. The vessel displayed a trial speed of 16 knots.

Shipboard and hydroacoustic noise is carefully controlled. Special measures were taken throughout the design and building program to ensure extremely low noise levels. All rotating machinery installations are resiliently mounted, and vibration characteristics of the steel structure and hull is made without interference from machinery and propulsion plant.

The vessel measures 92.5 meters long, with a 20-meter breadth and a 6.4-meter design draft. It can accommodate 61 people, as it features five suites with a day room, bedroom and bathroom; two one-man cabins; 16 two-man cabins; 11 two-man bedrooms attached to day rooms and one two-bed hospital.

WESTERN REGENT
Equipment List

Main engine	Ulstein Bergen
Propeller	Ulstein Propeller
Auxiliary generator	Cummins
Bow thruster	Ulstein Propeller
Generator engine	Stromberg
Generators	Stromberg ABB
Thruster engine	Stromberg
Engine controls	Ulstein Marine Electronics
Steering gear	Ulstein Frydenbo (Anschutz)
Shafting	Ulstein Propeller A/S
Windlasses	Norwinch
Switchboards	Ulstein Marine Electronics
Radar	Furuno
Gyro compass	Tokyo Keiko
Autopilot	Robertson
Satellite communications	Furuno
Inmarsat	J.R.C.
VHF radio	Jotron
SSB radio	Skanti
Coatings	International

FUTURA

Kvaerner Masa
Circle 81 on Reader Service Card

The 95,000-dwt M/T Futura, a double-hulled special tanker, was delivered to its owner Neste Oy, the Finnish state-owned oil company.

The 790.7-foot vessel has a breadth of 131.2 feet and a design draft of 45.9 feet. The ship was specially built to import crude and oil products from the North Sea area to Finland, but is also equipped for worldwide operation. The ship represents the latest development in tanker technology and oil transport safety, and is one of the few tankers with ice strengthening in this size class. The vessel has accommodations for 18 crew plus two spare cabins.

The M/T Futura is designed to allow for the future installation of a cargo loading station in the bow, which would make it possible to take crude oil directly from the North Sea offshore loading stations. It is already equipped with two efficient bow thrusters, one stern thruster and a high lift rudder. A second vessel of the Futura class that was recently launched and due for delivery in January 1993, the Natura, will also be of this type and have a Dynamic Positioning System fitted.

The ship's cargo area, divided into seven cargo and two slop tanks, is protected by the tanker's double bottom and double side construction, which will help to prevent oil spillage in the event of an accident and reduce tank heating requirements in very cold waters. The cargo system consists of seven Kvaerner Eureka CL250N2 electrical deepwell pumps, rated at 41,318 cubic feet per hour at 130 MLC, and driven by frequency-controlled electric motors. Although this pump system has already been fitted on product tankers, the M/T Futura will be the first crude oil tanker to receive the installation. The cargo pump control and monitoring system and the frequency converters were delivered by ABB Marine, Helsinki.

Instead of the conventional installation of one slow diesel the vessel has two 5,430 kW Wartsila Vasa 6R46 medium speed diesels connected by Schelde reduction gears to a single controllable pitch KaMeWa propeller, driving the ship at a service speed of 14 knots. Finally, the vessel is outfitted with a Welin accommodation ladder system, which is stowed alongside the railing.

FUTURA
Equipment List

Main & Auxiliary engines	Wartsila
Reduction gears	Royal Schelde
Propeller, Thrusters	KaMeWa
Steering gear	Porsgrunn
Rudder	Becker
Alternators, Shaft generator	Leroy Somer
Emergency alternator	MAN/Stamford
Boiler, Exhaust gas boiler	Sunrod
Cargo pumps and Ballast pumps	Kvaerner-Eureka
Frequency converters	ABB Marine
Ballast ejectors	Golar
Firefighting equipment	Unitor/Autronica/ Kvaerner-Eureka
Lifesaving appliances	Viking/Watercraft/Waterman
Deck machinery	Pusnes
Hose Crane	Hagglunds
Compasses	Anschutz
Integrated Nav System	Selesmar
Autopilot	Kockum
Echo sounder	Simrad
Doppler speed log	Atlas
GPS/Loran	Northstar
Decca	Philips
Radio equipment	JRC
Ladder system	Welin

HANJIN OSAKA

Hanjin Heavy Industries
Circle 78 on Reader Service Card

Hanjin Heavy Industries delivered the Hanjin Osaka, a high-speed containership with a capacity of 4,024 TEU.

The vessel is designed for round-trip, worldwide service and is driven by a single screw, super long stroke diesel engine from Sulzer/Hyundai, model 10RTA84C, which was specially developed for high-speed container ship service. The engine is capable of generating 51,500 bhp at 100 rpm, and drives a Hyundai Heavy Industries fixed-pitch/controllable-pitch, eight meter diameter propeller. The engine is assisted by bow thrusters from Techno Nakashima, which have outputs of 1,800 kW. The service speed, at 78.3 percent MCR engine output, is 24 knots.

Non-weathertight pontoon type hatch covers with three rows are installed to suit with two longitudinal deck girder system, which allows five tiers by 13 rows of containers on the hatches.

The vessel can be operated by one man in the wheelhouse, as shipowner and yard made every accommodation for a centralized information/control center layout. To allow one-man operation, the wheelhouse layout is designed so that all information and operation can be under one navigators's control. The ship is equipped with an Atlas Electronic total navigation system, model NACOS with 8,600 ARPA and 7,600 AC/TM radar. The satellite navigation system is from Racal Decca, model MNS 2000. Radio equipment was supplied by J.R.C.

The Hanjin Osaka is 289.5 meters long, 32.2 meters wide and has a

draft design of 12 meters. The ship is equipped with four sets of auxiliary diesel alternators, supplied by manufacturer Heeco. The alternators are powered by Ssangyong Wartsila engines. Two boilers provided by Aalborg and Kangrim, are included on the ship. They are boiler types AQ-12 and exhaust gas evaporation, respectively. The former has an output of 5,000 kg/hr, while the latter has an output of 3,500 kg/hr.

The fire protection system was provided by Nam-Yank, and includes a fixed CO_2 system in the cargo holds and engine room, a portable CO_2 system in the cabins, and a portable CO_2 and foam extinguishing system in public spaces. The fire detection system was provided by Salwico.

HANJIN OSAKA
Equipment List

Main engine	Sulzer/Hyundai
Propeller	Hyundai Heavy Industry
Auxiliary alternators	Heeco
Auxiliary alternator engines	Ssangyong Wartsila
Boilers	Aalborg/Kangrim
Cranes	Toyo Hoist Mfg. Co.
Deck Machinery	Brissonneau & Lotzmarine
Hatch covers	Nakata-Mac. Corp.
Ballast control systems	Valmet/Samgong Danfoss
Bow thrusters	Techno Nakashima Co., Ltd.
Bridge controls	Nabco
Fire detection	Salwico
Fire extinguishing	Nam-Yang
Navigation system	Atlas Electronic
Satellite navigation system	Racal Decca
Radios	J.R.C.
Onboard computers	Lyngso-Valmet

BERGELAND

Hyundai Heavy Industries
Circle 80 on Reader Service Card

The 320,000-dwt ore carrier Bergeland was delivered by Hyundai Heavy Industries Co., Ltd. to Bergesen D.Y. A/S, of Norway.

In service to transport iron ore from Brazil, Australia and Europe to Japan, the ship is the result of a $95 million contract signed in March of 1990.

Driven by a Hyundai B&W 7S80 MC engine of 29,050 hp at 74.6 rpm in service, the Bergeland, which also sports an exhaust gas turbocharger, has a service speed of 15 knots.

Steering gear was provided by Porsgrunn.

The Bergeland is flush decked and has a bulbous bow to provide optimum performance.

The flush deck has transverse bulkheads and two longitudinal bulkheads in the cargo hold areas. The ship, all told, has seven cargo holds.

The Hyundai-Pusness deck machinery which is featured on the ship is fitted with two halves type, hand-operated friction band break and clutch operated locally.

Two sets of windlasses combined with the mooring winch are designed to provide a line pull at average hoisting speed of nine meters per minute.

A crane, with a lifting capacity of eight tons at port and five tons at starboard, is remotely controlled from the ship's side by a portable controller. Hatch covers were provided by Hyundai-Kvaerner.

Electric power for the ship is provided by two 900-kW diesel generators and one 100 kW turbo generator, plus a 200-kW emergency generator.

The diesel generator engine is from Hyundai B&W and the emergency generator from Ssangyong-Cummins.

An auxiliary boiler from Aalborg is a vertical cylindrical type of nine ton/h steam generating capacity. The auxiliary boiler is also designed to serve the role of a steam separator for the exhaust economizer.

The Norcontrol system, consisting of SAU and PCU and multifunctional keyboard, has been applied to control and monitor all essential functions. The electronic navigation chart is from Robertson of Norway.

Other electronic equipment onboard includes: radar from Krupp Atlas; R.D.F. from Koden; integrated satellite navigator from SES-Shipmate; gyro compass/auto pilot from Sperry; satellite communications from SES-EB; and the main switchboard from Heeco.

Alfa-Laval was the manufacturer selected to outfit the vessel with a purifier and an F.W. generator (distiller).

The refrigeration plant is from

Sabroe, and Hi-Pres provided the air conditioning unit. Life rafts are from Viking.

The vessel was covered with coatings from Chokwang-Jotun.

BERGELAND
Equipment List

Main engines	Hyundai B&W
Diesel generator engine	Hyundai B&W
Exhaust gas economizer	Kangrim
Steering Gear	Porsgrunn
Deck machinery	Hyundai-Pusness
Store and provision crane	Hyundai-Normarine
Hatch cover	Hyundai-Kvaerner
Refrigeration	Sabroe
F.W. generator (distiller)	Alfa-Laval
Purifier	Alfa-Laval
Steam turbine for generator	Shinko
Auxiliary boiler	Aalborg
Main switchboard	Heeco
Monitoring system	Norcontrol
Emergency generator	Ssangyong-Cummins
Satellite navigator	SES-Shipmate
Satellite communications	SES-EB
R.D.F.	Koden
Radar	Krupp Atlas
Gyro compass/auto pilot	Sperry
Lifeboat	Jorgensen & V.K.
Life raft	Viking
Galley equipment	BEHA
Air conditioning	Hi-Press
Joiner bulkhead linings/partition	BU-IL Industries
Paint	Chokwang-Jotun

NATHANIEL B. PALMER

North American Shipbuilding
Circle 84 on Reader Service Card

The R/V Nathaniel B. Palmer, from the Larose, La., shipyard of North American Shipbuilding, is the nation's first commercial icebreaking research ship.

Able to break ice three feet thick at a speed of three knots, the 308-foot vessel is currently operated under the guidance of Antarctic Support Associates, a joint venture of Holmes & Narver, Services, Inc., of Orange, Calif., and EG&G Inc., of Wellesley, Mass., for the National Science Foundation U.S. Antarctic Program.

The vessel, developed for the express purpose of supporting research in Antarctica, is owned by Edison Chouest Offshore.

Ice classed to new ABS rules, ABS A-2, the Palmer can navigate rough open seas, rolling less than eight degrees in 16-foot waves, and has accommodations for 37 scientists and 26 crew.

The 6,500-long ton ship's sophisticated electronic equipment includes Robertson's Disc Navigation System, an Electronic Charts Display and Information System (ECDIS).

It is a real-time geographic information system which combines both spatial and text data to continuously determine the vessel's position in relation to land, charted or observed objects, glaciers, or ice packs, and many other unseen hazards.

The Palmer's ECDIS will also output position data to the Robertson Dynamic Positioning System which will allow the Palmer to negotiate into and out of, or through areas that require special low-speed maneuvering.

The ship's propulsion system consists of four Caterpillar 3608 diesels, rated at 3,180 bhp each at 1,000 rpm, with two nozzled Ulstein stainless steel, controllable-pitch four-blade propellers.

Four Caterpillar/KATO 3512 gensets, rated at 1,070 kW each, supply ship service power. Two Ulstein 1,500-hp direct drive diesel bow thrusters and one 800-hp tunnel stern thruster are available for added maneuverability.

NATHANIEL B. PALMER
Equipment List

Main engines	Caterpillar
CP propellers	Ulstein
Generators	KATO
Generator engines	Caterpillar
Bow thrusters	Ulstein
Stern thruster	Ulstein
DP system	Robertson
ECDIS	Robertson
Research winches	Markey Machinery
Steering controls	Robertson
Refrigerator doors	Cospolich

GEORGE WASHINGTON

Newport News Shipbuilding
Circle 83 on Reader Service Card

The George Washington (CVN 73) is a nuclear-powered, Nimitz-class Aircraft Carrier delivered by Newport News Shipbuilding, Newport News, Va.

The 97,000-ton ship, delivered in

June, measures 1,094 feet long, 257 feet wide and has a 37-foot draft.

The ship is driven by two nuclear reactor propulsion units which drive four, 66,220-pound propellers through four reduction gears.

The George Washington is also equipped with four sets of engine controls, one for each diesel generator which supply the ship's power.

The vessel is also outfitted with four power unit steering controls, two port and two starboard, and two emergency steering units.

Deck machinery includes anchor windlass, boat aircraft crane and replenishment winches.

Electronics onboard include three VHF radios, 37 UHF radios and 12 SSB radios; a mark 19 gyro compass; and autopilot.

Radar equipement includes: Surface, AN/SPS-64 and AN/SPS-67; Air Search, AN/SPS-48C and AN/SPS-49(V)5; and Air Traffic Control, AN/SPN 41, AN/SPN 43 and AN/SPN 46.

Additionally, the ship is equipped with 18 electrical fire pumps, and Marine Electric Systems outfitted the George Washington with salinity and temperature monitors, according to the manufacturer.

The George Washington is the 26th aircraft carrier built by Newport News Shipbuilding, and the sixth Nimitz-class carrier.

President **George Bush** was the principal speaker at the christening ceremony, and First Lady **Barbara Bush** was the ship's sponsor.

The delivery is the result of a two-carrier contract, for the George Washington and the Abraham Lincoln, signed in 1982.

M.S. OTELLO

Hitachi Zosen Corporation

Circle 79 on Reader Service Card

The M.S. Otello is a 6,000-unit car/truck carrier, built by Hitachi Zosen Corporation's Maizuru Works yard for Sweden's Wallenius Safe Gothia AB.

Delivered in September of this year, the 52,288-ton ship measures 653 feet long, by 106 feet wide and has a 40-foot draft.

The M.S. Otello is powered by a Hitachi B&W 8L60MC diesel engine capable of delivering a maximum output of 17,020 ps at 105.5 rpm. The engine drives a five-blade, 6.4-meter diameter propeller.

The vessel, which attained 20.6 knots in trials, has a service speed of 19.6 knots. The Hitachi B&W engine has a continuous service output of 14,490 ps at 100 rpm. The ship's propulsion gear also includes one 1,325 kW thruster driven by an electric thruster engine.

Shipboard power is provided by three generator sets, producing 1,400 kW each, and is backed by a 160 kW emergency generator.

Electronics on the Otello include Transtema VHF (models RT-2047, RT-2048 and TRP 3000) and SSB radios (model FRB 8750); Selesmar radar (Selescan model 1024 type, two sets); Tokimec gyro compass (model TG-5000); Furuno GPS navigator (model GP-5000); and Tokimec autopilot and Kockum Sonic steering master.

M.S. OTELLO
Equipment List

Main engines	Hitachi B&W
Radar	Selesmar
Compass	Tokimec
Loran	Furuno
Autopilot	Kockum Sonics
Coatings	SP

Mastera

Daewoo Shipbuilding and Heavy Machinery

Circle 95 on Reader Service Card

The suezmax double-hull tanker Mastera was delivered by Daewoo Shipbuilding and Heavy Machinery Ltd. to Neste Oy in January 1992.

The tanker, which is 274 meters long; 48 meters wide and has a 17-meter draft, is powered by a single KHIC-B&W 6S70MC diesel engine driving a Lips four-bladed fixed-pitch propeller. At the NCR of 18,850 bhp at 85 rpm, the loaded service speed is 14.7 knots.

The Mastera is designed for worldwide service for the transportation of crude oil and oil products. She has three cargo segregations with nine wide-beam center cargo tanks and two slop tanks.

A Becker flap rudder is provided to improve maneuverability. Dongmyoung-Kawasaki two-ram, four-cylinder steering gear with two hydro pump units is arranged to operate the rudder.

One 1,200-kW and two 900-kW Heeco generators provide the vessel with electric power. The generators are driven by a SsangYong/MAN B&W 8L28/32H and 5L28/32H diesel engines.

Two Sunrod oil fired auxiliary boilers, each 25 ton/h of 16/kg/cm^2 saturated, are provided to supply the steam required for simultaneous operation of two HPP steam turbines for cargo discharge conditions and general service. Steam generation at sea is taken care of by a Sunrod exhaust gas boiler to raise 1,800 kg/h of steam on the main engine uptake.

Accommodations are arranged on five levels, and a six-person elevator serves all decks from the engine control room to below the navigation bridge deck. Crew amenities also include a built-in swimming pool and sauna.

The wheelhouse contains the main engine remote control system with telegraph steering gear control with auto pilot, rasterscan radars with ARPA from Krupp-Atlas and a JRC GPS.

Mastera
Equipment List

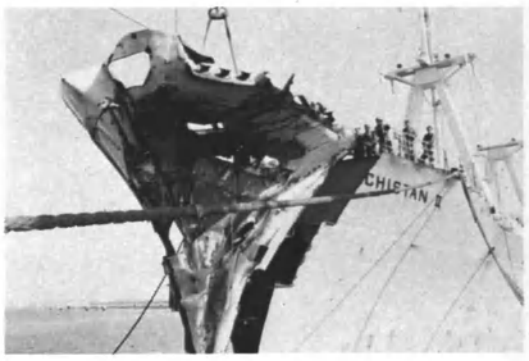
Main engines	KHIC-B&W
Propeller	Lips
Generator engines	Ssangyong/MAN B&W
Generators	HEECO
Engine controls	Norcontrol
Deck machinery	DW Norwinch
VHF, SSB radios	JRC
Radar	Atlas
Compass	Anschutz
GPS	JRC
Autopilot	Anschutz
Pumps	Frankmohn

BU-IL Industries Co. Offers Wide Range Of Products

BU-IL Industries, Co., Ltd., represented by Marine Accommodations, Inc. of Jacksonville, Fla., is the largest manufacturer of the "BIP" rockwool core joiner system.

The manufacturer has supplied all of the joiner bulkhead linings/partitions, ceilings, doors, pre-fab bathroom units and furniture to the M/V Bergeland built by Hyundai Heavy Industries; the Hanjin Osaka constructed by Hanjin Heavy Industries; and the Patriot from Samsung Shipbuilding.

Reasons for repair at Astilleros?









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Circle 204 on Reader Service Card

The Shipbuilders of Spain

Ludwig Wins Elmer A. Sperry Award

Daniel K. Ludwig, a pioneer in the development of the modern supertanker, was a recipient of the 1992 Elmer A. Sperry Award, which is sponsored jointly by the American Society of Mechanical Engineers (ASME) and five other professional organizations.

The award "recognizes a distinguished engineering contribution which, through application, proved in actual service, has advanced the art of transportation whether by land, sea or air."

The award was presented October 30, 1992, at the Society of Naval Architects and Marine Engineers (SNAME) meeting, held in New York.

The award is posthumous, as Mr. **Ludwig** died in August 1992 at the age of 95.

He built a fleet of oceangoing oil tankers and bulk carriers that were innovative in design, construction, size and performance. Mr. **Ludwig** built his first 24,000-ton tanker in 1945, followed by a succession of larger vessels.

In 1966, he began construction of the world's first genuine supertanker, a vessel with a cargo carrying capacity of 327,000 dwt.

The Elmer A. Sperry Award was established in 1955 to encourage progress in transportation engineering.

The award is presented annually by ASME, SNAME and the Institute of Electrical and Electronics Engineers, the Society of Automotive Engineers, the American Institute of Aeronautics and Astronautics and the American Society of Civil Engineers.

Chevron Christens IHI-Built Tanker, 'James N. Sullivan'

Chevron's newest tanker, the James N. Sullivan, named for a Chevron Corporation vice chairman, was christened by **Arlene Sullivan** at a ceremony at the Ishikawajima do Brasil Estaleiros S.A. (ISHIBRAS) shipyard in Rio de Janeiro, Brazil.

The latest addition brings Chevron's worldwide fleet to 41 vessels.

Under a contract with Mitsui & Co., and Ishikawajima Harima Heavy Industries Company, Ltd. (IHI) of Japan, the James N. Sullivan is the first of three identical 132,000-dwt, double-hull tankers being built for Chevron by IHI's Brazilian affiliate, ISHIBRAS.

The next two are scheduled for delivery in February and August, 1993.

The Sullivan is part of Chevron's ongoing fleet retirement and renewal program.

The tanker will carry approximately one million barrels of crude oil on each voyage, allowing it to be used in a number of regular Chevron trades, such as West Africa to the U.S. East Coast; Indonesia to the U.S. West Coast and the Middle East to the U.S.

MarAd Honors American Flag Ships

The Maritime Administration (MarAd) awarded certificates of appreciation to 33 exporters and importers who patronize U.S.-flag merchant ships.

The agency's award program recognizes American and foreign shippers who use U.S.-flag merchant ships to carry a substantial share of their international cargoes.

The American ocean carriers participating in the awards program were: American President Line; Crowley American Transport, Inc.; Farrell Lines; Lykes Bros. Steamship Co.; Sea-Land Service, Inc.; and Waterman Steamship Corp.

The exporters and importers who received U.S. merchant marine certificates of appreciation were: ABB SUSA, Inc.; Acerol Corp.; Aris Isotoner; Avon Products; Church & Dwight Co.; Domino Sugar Corp.; and Ebasco Services, Inc.

Electronics Update

Raytheon Adds Enhanced Navigation Package As Standard On Pathfinder/ST Radar Systems

Raytheon Pathfinder/ST 34-cm ARPA (left) and 25-cm TM/EP Radar Consoles

Raytheon's Pathfinder/ST provides a new level of navigation performance with the addition of the Enhanced Navigation Package (ENP) as standard on all ST Radar sales. With ENP, operators of ships and ocean-going yachts can enjoy an added measure of efficiency and safety.

The ENP is available in two versions to fit either ARPA or TM radar systems and adds numerous navigation capabilities, such as: self-prompting menus for simplified operation; selectable readout units in nautical miles, kilometers or statute miles; back-up plotting capabilities for safer navigation in case of gyro failure or for head-up RM operation; high resolution speed log input for precise target tracking information; true and parallel index nav lines for simplified plotting; and map positioning by lat/long for automatic map registration. Additional features of the ENP include Stored Nav-Lines (ARPA only) so that maps can be stored indefinitely without the need for battery support; bow crossing range/time for numeric display of ranges and times for all targets; numeric and vector displays of set and drift; and a serial data I/O port (ARPA only) for interface to printers and computers.

Pathfinder/ST Radars offer ten ranges from 1/4 to 96 nm. For both the ARPA and TM models, a choice of 34- or 25-cm displays are available and meet International Maritime Organization (IMO) requirements for 16- and 12-inch CRT displays.

The Pathfinder/ST Radar satisfies a wide range of installation and operating requirements, and can retrofit the displays of older Raytheon Bright Display Radar Systems, or act as high performance repeaters for radars offered by other manufacturers. Multi-unit systems permit keyboard interswitching of up to three displays and transceivers, in any combination.

For additional information on this Raytheon product,

Circle 74 on Reader Service Card

Systron Donner Introduces Model 914 Marine Fire Protection System

The safety systems division of Systron Donner, Concord, Calif., has been producing industrial and marine fire protection systems for over 20 years.

The Systron Donner Model 914 marine fire protection system is designed to meet U.S. Navy requirements for rapid fire detection, warning and suppression in small boat engine rooms, machinery spaces, storage lockers and other hazard areas. Typical applications include workboats, patrol boats, dive boats, landing craft and mine hunters/sweepers.

The electrically supervised 914 system includes the Systron Donner pneumatic fire/overheat detector, main and reserve extinguishers, a multifunction system controller with repeater display and optional remote release stations.

The controller incorporates a number of operating modes and features, including a manual or automatic operation switch. The 914 controller provides continuous fault monitoring and is available in an aluminum or a stainless steel enclosure.

The system is reported to be lightweight and rugged. It is cost-effective in that it draws a standby power of 60 mA at 24 Vdc. A typical 914 system with two 33 pound capacity Halon extinguishers weighs approximately 156 pounds.

For free literature detailing the Model 914 fire system,

Circle 72 on Reader Service Card

Myron L Company Offers New Color Brochure On Monitors/Controllers

The Myron L Company of Carlsbad, Calif., has released its new four-color brochure which profiles its line of conductivity/pH meters and monitor/controllers. The brochure is meant to help guide people in industries which depend on the quality of their water.

Myron L meters are used to check total dissolved solids, which can cause scale or corrosion in boiler water and boiler condensate. For boiler water, conductivity readings are used to determine the optimum blowdown schedule and for checking boiler condensate.

The Myron L Controlstik Systems regulate the flow of rinse water, conserve water and can help reduce investment in waste treatment equipment, the manufacturer claims.

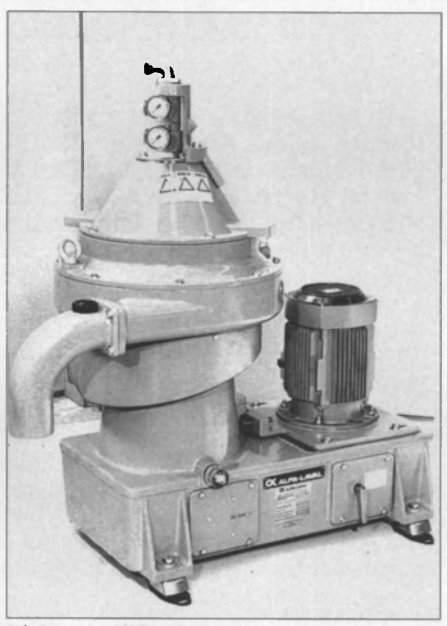
For a free brochure on the entire Myron L product line,

Circle 64 on Reader Service Card

New Alfa-Laval Separator Has ALCAP Technology

With the introduction of a new MFPX 307 separation system for fuel oils, Alfa-Laval is furthering the applications of the technology embodied in the ALCAP series of FOPX separators. The MFPX 307 is a reconfigured design which integrates ALCAP functional technology and the mechanical design of the company's MMPX range of controlled partial-discharge separators.

Designed to replace the FOPX 607 separator for cleaning of fuel oil with densities up to 1,010 kg per/m^3 at 15 degrees C for marine and power applications, the MFPX 307 is also suitable for cleaning distillate and marine diesel oil (MDO).



Alfa-Laval's MFPX 307 separator replaces the FOPX 607 separator, providing higher capacity and increased flexibility.

The new unit offers users a broader application and capacity range than was available with the FOPX 607. The separation system comprises an MFPX 307 separator and ancillary equipment, including the EPC 400 control unit. An oil feed pump with starter, starter unit for separator, a strainer and an oil-heating system are offered as ancillary equipment.

The MFPX 307 has no gravity discs. It differs as well by having a built-in valve for water drainage and by enabling the continuous electronic monitoring of changes in the water content in the cleaned oil.

For additional information on the MFPX 307,

Circle 90 on Reader Service Card

Monark Diesel And MAN-Power Sign Agreement

Monark Diesel (MD) GmbH & Co. of Hamburg, Germany, a manufacturer of diesel fuel injection equipment, starter motors/alternators, and air, fuel and lubricating oil filters for marine and industrial diesel engines, has signed an agreement with MAN-Power Diesel (MPD), Inc. of Brooklyn, N.Y., in which MPD is appointed the sole importer/distributor for the MD marine product line in the U.S., Canada and Mexico.

Founded in 1951 as a manufacturer of diesel engine components and accessories, Monark Diesel is an OEM supplier for many European engine manufacturers, such as MAN, MAN B&W, Sulzer, Pielstick, Mercedes-Benz, and KHD. MD offers a full line of fuel injection equipment comparable with Robert Bosch, CAV, Duap, L'Orange and others.

For additional information on Monark Diesel,

Circle 75 on Reader Service Card

For additional information on MAN-Power Diesel,

Circle 76 on Reader Service Card

NAVY SEALIFT PROGRAM

COMPETITION INTENSIFIES TO CAPTURE PIECE OF $2.5 BILLION IN CONTRACTS

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

The sealift program has moved to the final stage of competition, and Congress has added more money to an already burgeoning account. Construction and conversion of sealift ships is by far the most significant near-term opportunity available to U.S. shipbuilders and equipment manufacturers for substantial business.

1993 Defense Budget

The 1993 defense appropriations and authorization bills provided additional funding for sealift and created the National Defense Sealift Fund.

Congress provided an additional $613.4 million for sealift funding in the 1993 defense appropriations bill.

Combined with the $1.875 billion carried forward from prior years, the Department of Defense (DOD) now has available almost $2.5 billion to implement the sealift ship construction program.

In providing defense funds for 1993, Congress agreed to establish a National Defense Sealift Fund. Creation of this fund was proposed by the Administration in the 1993 budget request.

Prior year funding had been provided in the Navy's shipbuilding and conversion budget. The new fund is placed under the control of the Secretary of Defense and is to be "the mechanism for channeling resources to meet strategic sealift requirements."

Under the previous budget, $1.875 billion had been earmarked just for sealift ship construction and conversion.

While the amount available for the sealift program has now been increased to $2.5 billion, the available funds are to be used for four purposes:

-- For construction, purchase, alteration and conversion;
-- For operations, maintenance, lease and charter;
-- For installation and maintenance of national defense features on privately-owned and operated vessels;
-- For research and development.

The extent to which the fund will be used for purposes other than ship construction and conversion remains to be determined.

DOD is directed to specify in future budget requests how it will allocate the funding. Conceivably, the amount available for ship construction could actually be less than the earlier figure.

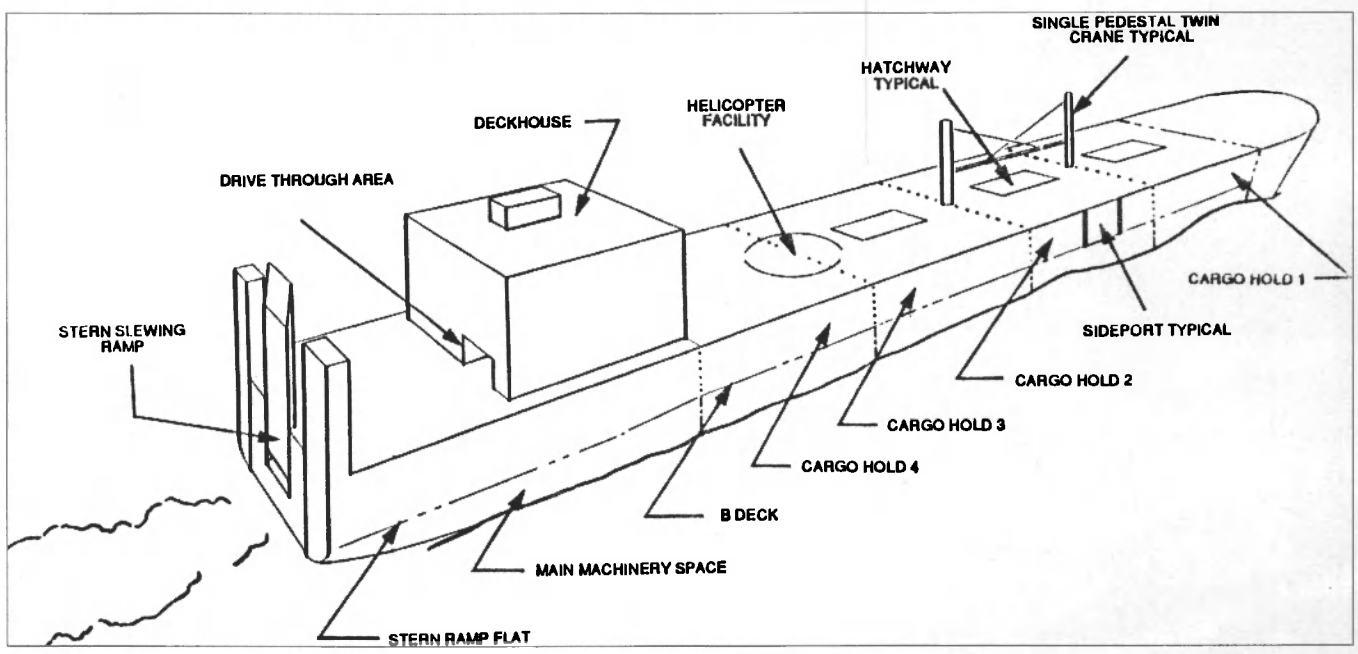
Congress attached the restriction that no more than five foreign-built vessels may be purchased using sealift funds. Congress also extended restrictions on domestic sourcing which applied to prior year sealift funding, reiterating that vessels constructed under the program must:

-- Incorporate propulsion systems whose main components, such as engines, reduction gears and propellers, are manufactured in the U.S.
-- Machinery control systems and interior communications equipment manufactured in the U.S. and "have more than half of their value, in terms of cost, added in the U.S.," unless "the costs of compliance would be unreasonable compared to the costs of purchase from a foreign manufacturer."

The difference in language is worth noting. In the case of propulsion systems, no cost reasonableness criterion is specified. However, such a criterion is applied to control systems and communications equipment.

Construction And Conversion Competition

After a long delay, the Navy has issued solicitations to construct new ships, buy and convert existing ships and procure long lead items for the



sealift program.

On October 2, the Naval Sea Systems Command (NAVSEA) issued the engineering design solicitation for the next phase of the sealift ship new ship construction program. Bids were due on November 13.

The ship will be panamax size, with a 35-foot draft at design load, and be capable of 24 knots sustained speed. A 12,000 nautical mile threshold range is specified.

Diesel or gas turbine propulsion will be fitted, driving fixed-pitch or controllable-pitch propellers on multiple shafts. To maximize design creativity, only a generalized vessel configuration is included in the NAVSEA circular of requirements.

Multiple awards for engineering design will be made.

Up to nine shipyards can be expected to receive contracts. The value of each contract will be limited to $1.2 million. Period of performance will be 180 days.

One to three shipyards will be selected for the detailed design and construction contract:

-- One yard will be chosen if it determined that a total of six ships are to be built;

-- One or two yards will be chosen if 12 ships are to be built;

-- Up to three yards will be selected if a total of 18 ships are to be built.

On September 4, the Navy issued a solicitation requesting proposals for a ship conversion/design contract. Proposals were to be delivered to NAVSEA at the end of October.

Multiple fixed-price awards will be made for the initial phase. The awards will not exceed $400,000 per contract.

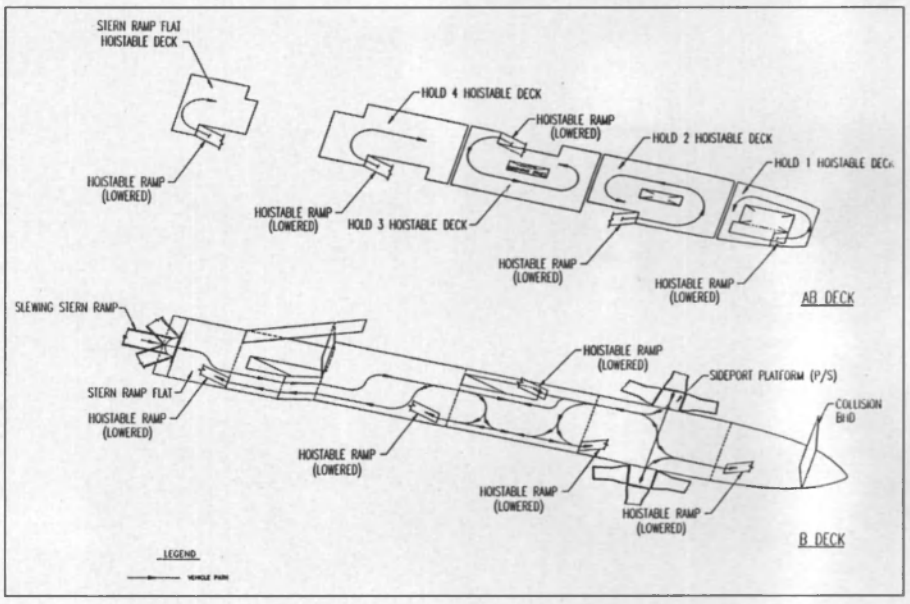
Shipyards submitting bids must have a letter of intent with a shipowner able to provide a candidate ship for conversion.

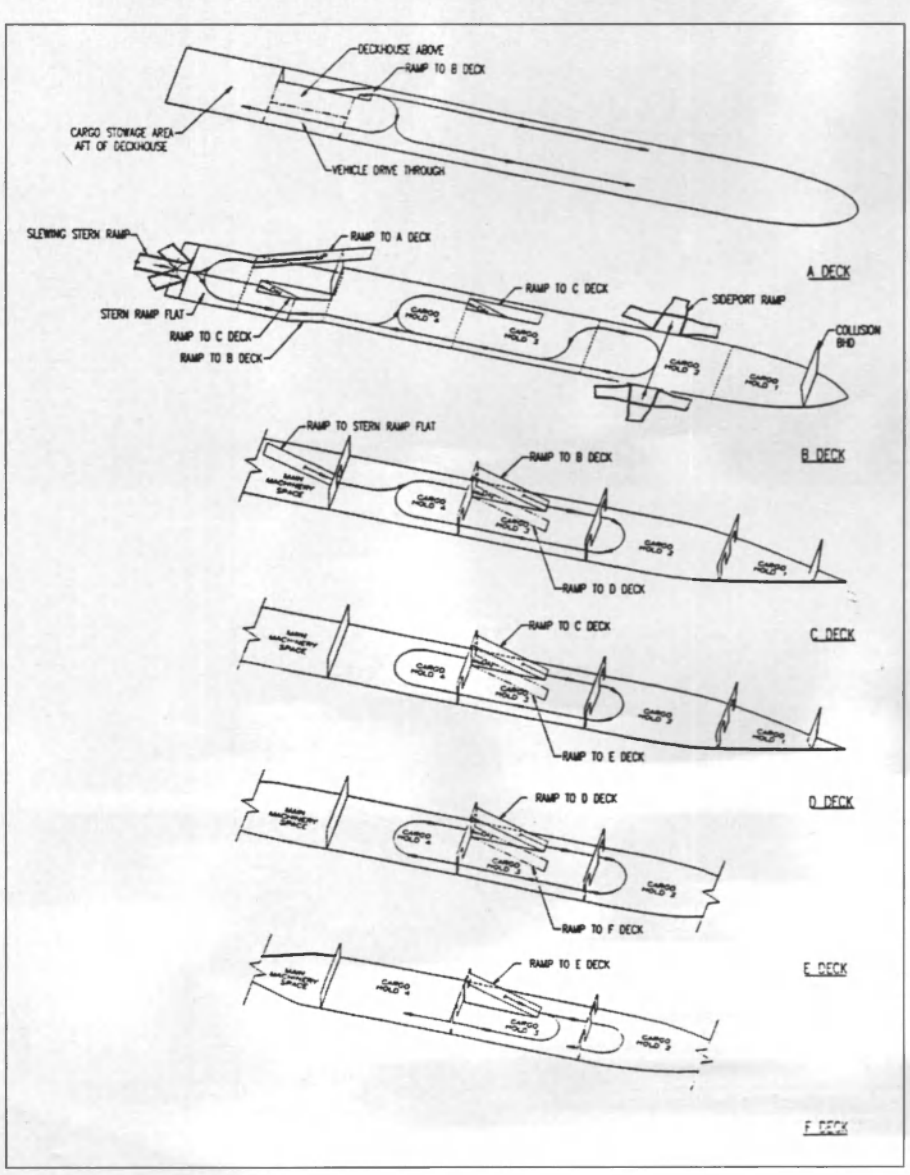
Candidate ships must be capable of 24 knots. Gas turbine as well as diesel powered ships can be offered for conversion. Up to five foreign ships can be acquired and converted.

Also issued on September 4 was a Request For Proposals (RFP) to supply class standard equipment for sealift ship conversions and construction. Proposals were due November 12.

The successful contractor will design, manufacture and integrate the cargo handing system in both the conversion and new construction programs.

IMA tracks developments as they occur in the sealift program. For additional information, contact IMA Associates, Inc., 600 New Hampshire Ave., NW, Suite 140, Washington, D.C. 20037. tel: (202) 333-8501; fax: (202) 333-8504.





NAVY CONTRACTS

ITT Gilfillian, of Van Nuys, Calif., has been awarded a $69 million Navy contract to supply AN/SPS-48E radars for the aircraft carriers George Washington, Abraham Lincoln and Carl Vinson.

A number of retrofit kits will also be produced by the company for existing SPS-48s to enhance defense against low-flying cruise missiles. The kits are called LOW-E, and will be fitted on aircraft carriers, guided missile cruisers and Wasp Class (LHD 1) amphibious assault ships.

Tracor Applied Sciences, Inc., of California, Md., was awarded a $31.5 million five-year contract with options by the Naval Regional Contracting Center, Philadelphia, Pa., to provide engineering and technical services in support of the U.S. Navy Aegis In-Service Communications Modernization Program. This program is conducted by the Naval Electronic Systems Engineering Activity (NESEA), St. Inigoes, Md.

General Dynamics Corp.'s, Electric Boat Division, of Groton, Conn., was awarded a $6.14 million contract by the Naval Sea Systems Command, Washington, D.C., for engineering and technical services in support of Ohio-class missile submarines (N00024-90-C-2109).

N.Y. Shipyard Corporation, Brooklyn, N.Y., has won a $2.3 million Navy contract for the advanced planning and material procurement of the drydocking phased maintenance availability of the U.S.S. Ainsworth (FFT 1090). Supervisor of Shipbuilding, Conversion and Repair, USN, Bath, Maine (N00024-92-H-8003).

Newport News Shipbuilding and Drydock Company, Newport News, Va., has been awarded a $3.1 million contract for the advanced planning for the selected restricted availabilities of the USS Newport News (SSN 750) and the USS Atlanta (SSN 712). Naval Sea Systems Command (N00024-92-C-8572).

Raytheon Company's Submarine Signal Division, of Portsmouth, R.I., was awarded a $5.8 million contract for AN/BSY-1(V) transmit group engineering and repair support from the Naval Sea Systems Command. (N00024-89-C-6050).

Diagnostic/Retrieval Systems, Inc., (DRS), of Oakland, N.J., has been awarded a $12.5 million contract from Naval Sea Systems Command for the development and production of AN/SQQ-T1A On-Board Trainer systems.

Under the contract, the company's Military Systems division will produce five new trainer systems and will provide upgrades to the three existing units currently operational on U.S. Navy frigates.

Operating in conjunction with ship's antisubmarine and electronic warfare systems, these trainers will present sonar operators, both at sea and in port, with a variety of realistic data to improve their target detection, localization and classification skills.

Bath Iron Works, of Bath, Maine, has received two Navy contracts worth $42.9 million for lead-yard class services associated with the construction of Arleigh Burke (DDG 51)-Class Aegis destroyers.

Continental Maritime, of San Diego, Calif., was awarded a $7.6 million repair services contract for the cruiser USS England (CG 22).

General Dynamics Corp.'s, Electric Boat Division, Groton, Conn., was awarded a $5.7 million contract for a selected restricted availability of the nuclear attack submarine USS Boston (SSN 703).

Moon Engineering, of Portsmouth, Va., has received a $5.3 million contract for the phased maintenance availability of the amphibious assault ship USS Portland (LSD 37).

Norfolk Shipbuilding and Drydocking Co., of Norfolk, Va., has been awarded an $8.9 million Navy contract for the drydocking selective restricted availability of the guided-missile destroyer USS Scott (DDG 995).

Pacific Ship Repair and Fabrication, of San Diego, Calif., was awarded a $44 million contract for the maintenance, upkeep and re-

pair of three aircraft carriers homeported in San Diego: USS Ranger (CV 61); USS Kitty Hawk (CV 63); and USS Constellation (CV 64).

Southwest Marine, San Diego, Calif., has received a $9.7 million contract for the regularly scheduled overhaul and drydocking of the Military Sealift Command auxiliary ship USNS Kilauea.

Avondale Shipyard Division, New Orleans, La., has been awarded a $3.6 million contract for the phased maintenance fixed-availability of the USS Truett (FFT 1095). Work on the vessel is scheduled to be completed by the end of the first quarter in 1993.

Houston Ship Repair and **Gulf Copper Manufacturing Corp.**, have been awarded two contracts by the U.S. Maritime Administration (MarAd) valued at more than $8.6 million for repairs to the Ready Reserve Force tanker SS Mount Vernon. Gulf Copper, of Port Arthur, Texas, received a $3,234,009 contract from MarAd for the first phase of repairs to the 49,200-dwt SS Mount Vernon. The work includes the activation and sea trial of the ship to prove its readiness, the completion of required repairs and the vessel's deactivation. The work is expected to be completed within 120 calender days.

For phase II of the tanker's refit, MarAd awarded a $5,487,681 contract to Channelview, Texas-based Houston Ship Repair for repairs that include the renewal of over 600,000 pounds of steel in the Mount Vernon's cargo tanks and blasting and applying epoxy coatings to all cargo tanks.

Detyens Shipyards, Inc., of Mt. Pleasant, S.C., has received a $2,388,314 Maritime Administration contract for voyage repairs and deactivation of the SS Cape Catawba. The work is expected to be completed within 65 calender days.

The Jonathan Corporation, Norfolk, Va., received an $8,456,529 contract from the Maritime Administration for the installation of sealift enhancement features on the Ready Reserve Force vessels SS Cape Juby and SS Cape Johnson.

The work includes installation of modular cargo delivery stations on the vessels to permit them to transfer cargo to Navy ships while underway.

The work is to be completed in 180 calender days.

Gulf Offshore, of Mobile, Ala., was recently awarded a $3,424,859 contract for deactivation and repairs to the breakbulk vessel SS Cape Buyer. The work is expected to be completed within 110 calender days.

Bethship Sparrows Point, of Sparrows Point, Md., has been awarded two contracts worth over $8 million by the Maritime Administration (MarAd) for Ready Reserve Force (RRF) ship repairs.

The first contract for $3,228,450 is for deactivation and repairs to the breakbulk vessel SS Pride. The work is expected to be completed within 60 calender days.

The second MarAd contract for the yard, worth $5,605,417, is for the deactivation and drydocking of the MV Cape Ducato, which is scheduled for completion within 90 calender days.

North Florida Shipyards, Inc., of Jacksonville, Fla., was awarded a $2,218,444 Maritime Administration contract for repairs and deactivation of the Ready Reserve Force vessel SS Cape Carthage. The work is scheduled for completion in 75 calender days.

Houston Ship Repair, Channelview, Texas, has received a $2,865,597 Maritime Administration contract for deactivation and repair work to the Ready Reserve Force breakbulk vessel SS Gulf Trader. The work is expected to be completed within 120 calender days.

Colonna's Shipyard, of Norfolk, Va., was awarded a $4,496,700 contract for deactivation work and repairs to the Ready Reserve Force auxiliary crane ship (T-ACS) Cornhusker State. The work is expected to be completed within 90 calender days.

AT&T Federal Systems, of Greensboro, N.C., has been awarded

NAVY CONTRACTS

a $25 million Field Engineering Services (FES) contract by the Space and Naval Warfare Systems Command (N00039-93-C-0059) for field engineering services organization for world wide support for the U.S. Navy's Integrated Undersea Surveillance System (IUSS) program.

Bender Shipbuilding & Repair Company, Inc., Mobile, Ala., was awarded a Maritime Administration contract for the drydocking and repair of the Ready Reserve Force cargo ship SS Buyer. The total contract value exceeds $1 million and will last approximately 25 days.

Empress Software, Inc., of Toronto, Canada, recently announced that the U.S. Navy has accepted delivery of its Empress Relational Database Management System (RDBMS) for use in the $200-million Primary Oceanographic Prediction System (POPS), provided through Grumman Data centers at the Naval Oceanographic Center, Monterey, Calif.

Grumman, the prime integrator on the ten-year contract, is to provide the Empress RDBMS and 4GL as well as hardware, software, installation, operation, maintenance and support services for POPS. Approximately ten percent of the contract belongs to Empress Software.

The Navy's requirements on the contract called for a RDBMS capable of running on all of the computers used at the Naval Oceanographic Office and at the Fleet Numerical Oceanography Center.

Beyond providing its software, Empress personnel are on-site full-time at both Stennis and Monterey to provide technical expertise and assistance in supporting and converting databases.

PRC, Inc., of McLean, Va., was recently awarded the Super-Mini-Computer procurement (AFCAC 300) contract from the U.S. Department of Defense (DOD). PRC will be the prime contractor for the nine-year contract, which has a total potential value of $2.5 billion.

The Super-Mini contract is the procurement vehicle for the U.S. Army, Navy, Air Force, Coast Guard and Defense Logistics Agency to acquire mini-computer systems for a variety of operations, including office automation, database management systems (DBMS) and engineering applications. Government civilian agencies may also use the contract for procuring their mini-computer systems. In addition, the contract provides for PRC to supply a full range of systems integration and support services.

The Super-Mini-Computer contract is one of the largest indefinite delivery, indefinite quantity (IDIQ) procurements ever awarded by the DOD. It specifies five years for the procurement of hardware and software, plus an additional four years for maintenance and support services.

Unisys Corp.'s, Paramax Systems Corporation, McLean, Va., recently received a $17 million contract from the U.S. Naval Sea Systems Command to groom the combat systems for guided missile frigates for a friendly nation.

The new contract modification covers an array of engineering services for additional ships and is scheduled to run until mid-1997.

Under the foreign military sales contract modification, Paramax will provide technical, logistics, program management, engineering and material support services for the frigate's combat systems.

Diagnostic/Retrieval Systems (DRS), Inc., of Oakland, N.J., has received a $2.5 million contract from Magnavox Electronics Company, Fort Wayne, Ind., to provide enhancements to video display generator units for the U.S. Navy's Improved Processor and Display System program.

The company's military systems division will provide the enhancements which are designed to upgrade the antisubmarine warfare (ASW) display systems onboard Navy P-3 Orion maritime patrol aircraft.

American Pacific Corporation, Las Vegas, Nev., announced that the U.S. Navy has completed two days of extensive testing of its Halotron I fire suppressant agent and application technology.

Halotron I is intended as a replacement for ozone-depleting Halon 1211 used in firefighting systems throughout the world.

The tests were conducted at the U.S. Marine Corps Air Station at Beaufort, S.C. In addition to the Navy and Marine Corps, representatives of other interested military and federal agencies were in attendance during the testing.

Bender Shipbuilding & Repair Company, Mobile, Ala., has been awarded a $3 million contract by the U.S. Navy's Military Sealift Command (MSC) for the drydocking, alteration and repair of the cable repair ship USNS Zeus (T-ARC 7). Bender will perform the work in 45 days and employ 75 workers.

The mission of the USNS Zeus is to support various Navy underwater cable activities. The MSC vessel is 503 feet in length, has a beam of 73 feet and displaces approximately 12,000 long tons.

Harris Corporation, of Melbourne, Fla., has received a six-year, $180 million contract from the U.S. Navy Space and Naval Warfare Systems Command to provide a new generation of high-frequency (HF) radio communication systems for surface ships.

Harris reported that the initial contract award is worth approximately $33.5 million.

Under the contract, Harris RF Communications, a Harris Corp. division based in Rochester, N.Y., will supply about 100 complete high-frequency ship sets, which will be used for retrofitting a portion of the Navy's major surface ships and for new construction. HF radio is used for ship-to-ship and ship-to-shore long-range, over-the-horizon communications.

Harris is also installing similar systems aboard 12 new vessels in the Canadian Patrol Frigate program under a $22.5 million contract from Paramax Electronics, Inc., based in Montreal, Canada.

Litton Industries, Inc.'s Ingalls Shipbuilding division, of Pascagoula, Miss., has been awarded a $30.3 million contract option to continue providing planning yard service support to the Navy's Ticonderoga Class (CG 47) Aegis cruisers.

Ingalls is currently constructing the last four of the 19 cruisers it has been contracted to build.

Under the support contract, originally awarded in 1984, Ingalls provides design, engineering, scheduling and logistics support services and planning for the maintenance, upgrading and overhaul of all Aegis cruisers in the fleet.

Newport News Shipbuilding and Drydock Company, Newport News, Va., has won a $400,000 contract for engineering and design work to convert commercial vessels to Navy sealift ships.

Bender Shipbuilding & Repair Company, Inc., of Mobile, Ala., has been awarded a $400,000 Phase I contract by the Naval Sea Systems Command (NAVSEA) to develop the Contract Design for the conversion of existing Roll-on/Roll-off (RoRo) ships to meet the requirements of the Navy Strategic Sealift program.

Bender will provide the Navy with a comprehensive engineering package which describes in detail the modification of existing RoRo ships for conversion to strategic sealift ships. This engineering data will be provided to NAVSEA within 90 days. Following submittal of the technical data, Bender will provide its detailed proposal for the conversion of a minimum of two ships. If accepted by the Navy, the conversion work would be accomplished by September, 1995, at Bender's Mobile shipyard.

Naval Vessels Under Construction

Symbol	Type	No. of Vessels	Total Light Disp. Tons
AOE	Fast Combat Support Ship	3	59,100
CG	Guided Missile Cruiser	4	38,000
CVN	Aircraft Carrier (Nuclear)	2	182,000
DDG	Guided Missile Destroyer	21	174,300
LHD	Amphibious Assault Ship	3	85,500
LSD	Dock Landing Ship	3	35,682
MCM	Mine Countermeasures Ship	5	6,310
MHC	Coastal Minehunter Ship	10	8,910
SSBN	Ballistic Missile Submarine (Nuclear)	5	62,500
SSN-688	Attack Submarine (Nuclear)	12	72,000
SSN-21	Attack Submarine (Nuclear)	2	18,300
T-AGOS-19	Ocean Surveillance Ship (SWATH)	2	4,972
T-AGOS-23	Ocean Surveillance Ship (SWATH)	1	3,800
T-AGS-45	Deep Ocean Survey Ship	1	7,312
T-AGS-60	Oceanographic Survey Ship	3	9,057
T-AO	Fleet Oiler	7	105,000
Total		**84**	**872,743**

NAVY CONTRACTS

IBM Corporation, Federal Sector Division, Manassas, Va., was awarded a $66.4 million contract by the Space and Naval Warfare Systems Command (N00039-91-C-0091) for oceanographic equipment.

Newport News Shipbuilding and Drydock Company, Newport News, Va., was awarded a $27.7 million Naval Sea Systems Command contract (N00024-91-C-2103) for expanded planning yard support for SSN 688 class operational submarines.

Westinghouse Electric Corporation, Plant Apparatus Division, Wilkins Township, Pa., has received a $319.7 million Naval Sea Systems Command contract (N00024-88-C-4007) for naval nuclear propulsion components.

General Electric Company, Machinery Apparatus Operation, Schenectady, N.Y., was awarded a $150 million Naval Sea Systems Command contract (N00024-88-C-4008) for naval nuclear propulsion components.

C-Cubed Corporation, Alexandria, Va., has received an $8.8 million contract for engineering and technical services for radio communication systems for minesweepers from the Naval Regional Contracting Center, Philadelphia (N00140-92-D-CD07).

General Dynamics Corp.'s Electric Boat Division, Groton, Conn., was awarded a $5.1 million Naval Sea Systems Command contract (N00024-91-C-4030) for reactor plant planning yard services for nuclear powered guided missile cruisers.

West State, Inc. (WSI), Portland, Ore., has been awarded contracts totaling about $13 million for the deactivation of five Maritime Administration vessels. The contracts will provide employment for 400 additional workers at WSI. Three of the vessels—the Cape Blanco, the Cape Breton and the Northern Light—are managed by American President Lines. Interocean Management Corporation manages the other two—the Green Mountain State and the Austral Lightning.

Peterson Builders, Inc. (PBI), Sturgeon Bay, Wis., has received a contract from Naval Sea Systems Command of the Department of the Navy for the construction of seven fiberglass-hulled 36-foot Landing Craft Personnel Large (LCPL). The contract performance period is approximately one year, with completed vessels being delivered by Peterson to New Orleans, La., and Williamsburg, Va.

Bender Shipbuilding & Repair Company, Inc., Mobile, Ala., has been awarded a $4 million contract by the Naval Sea Systems Command for the construction of two 146-foot YFB-92 steel hulled ferries. The vessels will have a beam of 36 feet, a draft of five feet, six inches and a top operating speed of 10 knots. The ferries will be delivered to the Navy at its base in Guantanamo Bay, Cuba. The first ferry is scheduled to be delivered in February, 1994, and the second ferry in April, 1994.

Hagglunds' Commitment To U.S. Strategic Sealift

Hagglunds, Inc., of Montvale, N.J., a subsidiary of Hagglunds Marine & Offshore AB, Sweden, has developed a family of cargo cranes ranging from two-ton service and hosehandling cranes to 120-ton twin cargo cranes for commercial and government marine operations. More than 6,000 Hagglunds deck cranes have been delivered over the past 30 years for use onboard ships and offshore installations.

John Albino, president of Hagglunds, said, "For two decades we in Montvale have actively participated in practically all American shipbuilding and conversion programs requiring rotating cranes."

"Our selection as the crane supplier for the original Sealift program, was, in part, the result of Hagglunds' commitment to

America," Mr. **Albino** continued.

Hagglunds' cranes are installed on 21 of the Military Sealift Command's fast sealift and military prepositioned ships. According to the company, all 99 Hagglunds' cranes, ranging from 36- to 100-ton lift capacities, performed as required during operations Desert Shield and Desert Storm. For the Maritime Administration's auxiliary crane ship (T-ACS) program, Hagglunds has so far delivered 32 specially designed cranes.

Hagglunds' cranes have also been widely adopted for use in arctic environments, with temperatures as low as -50 degrees Centigrade. This type of unit was delivered for use onboard the U.S. Coast Guard's icebreakers Polar Star and Polar Sea.

For additional information about Hagglunds, Inc.,

Circle 87 on Reader Service Card

White House Expected To Approve MarAd/FMC Funding Bill Shortly

The White House is reviewing a bill, already approved by the House and Senate, that would establish funding for the Departments of Commerce, Justice, State and Judiciary, and related agencies, for fiscal year 1993. The measure also includes $18.3 million for the Federal Maritime Commission (FMC) and $560 million for the Maritime Administration (MarAd). The bill is expected to be signed shortly.

MarAd's share includes $440.5 million in maintenance and additions for the Ready Reserve Force (RRF), provided the acquisition of U.S. ships has first priority. The funds may not be utilized to buy tankers and other vessels from foreign sources unless these ships are not available from U.S. sources.

Also included in the bill is $48 million to cover the risk associated with the Title XI loan guarantee program, as required by the Federal Credit Reform Act of 1990. The FMC's portion of the budget includes funding for the Automated Tariff Filing and Information System.

NAVSEA/ASNE Issue "Call For Papers" For 1993 Logistics Symposium

The Naval Sea Systems Command (NAVSEA) and the American Society of Naval Engineers (ASNE) have issued a call for papers relating to next year's NAVSEA International Logistics Symposium in Crystal City, Arlington, Va., June 29 to 30, 1993. The symposium, "Advanced Logistics Technology for the International Community," is being sponsored by both organizations.

A submitted abstract should describe the writer's topic, scope, approach and application of one of the following subject matter: Raster Imaging Technology; Computer-aided Acquisition & Logistics Support; Digitization of Logistics Documentation; PC-based Logistics Support Planning System; New Intermediate and Depot Level Maintenance Technologies; Supportability of Non-U.S. Supported Equipment; New COSAL Computation Models; New Configuration Management Programs; Ship Configuration and Logistics Support Information System (SCLSIS); International Computer-aided Provisioning; Repair Parts Requisitioning Procedures; New Training Technologies; New Initiatives in Reliability and Maintainability; or New Test Equipment Technologies.

One to two page abstracts should be submitted to: **James E. Grabb**, ASNE, 1452 Duke Street, Alexandria, VA 22314-3458. Tel: (703) 836-6727. Fax: (703) 836-7491. To exhibit, contact **Carol Hardee**.

Undersea R&D Budget For FY'93 $460 Million Over Administration's Request

The House increased the Navy's undersea research and development (R&D) budget by $460 million over the **Bush** Administration's request for fiscal year 1993.

Faring well in the R&D appropriations was the Defense Advanced Research Projects Agency's (DARPA's) non-acoustic anti-submarine warfare program, up to $46 million from the Administration's original $30 million request.

The $58 million for advanced submarine technology R&D that the Pentagon asked Congress for was approved by both the appropriations and authorization conference committees. Other DARPA undersea programs receiving Congressional appropriations include: $5 million for unmanned undersea vehicle technology; $15 million for advanced anti-submarine warfare technology involving the application of parallel computers; $4 million "to conduct an at-sea demonstration and evaluation of magnetohydrodynamic (MHD) drive," a quiet ship propulsion system using superconductivity; and $133 million, out of the $155 million requested by the Navy, to speed the development of the new Centurian attack submarine design.

Navy Extends Life Of Philadelphia Navy Yard With Repair Work

In the 1993 defense appropriations act, the Navy has been required by Congress to provide the Philadelphia Naval Shipyard with enough repair work to tide it over until the two-year overhaul of the aircraft carrier John F. Kennedy begins in September 1993.

Ingalls Christens 'Stout,' Navy's Latest Aegis Destroyer

The second ship built by Litton's Ingalls Shipbuilding division, Pascagoula, Miss., for the U.S. Navy's Aegis guided missile destroyer program was christened Stout. The new ship, designated DDG 55, is the fifth vessel of the Arleigh Burke (DDG 51) Class. Litton is currently contracted to build 10 of the ships, with the Stout scheduled for delivery in 1994.

Admiral **Jeremy M. Boorda**, USN, Commander-in-Chief, U.S. Naval Forces, Europe and Commander-in-Chief, Allied Forces, Southern Europe, delivered the principal address; his wife, Mrs. **Bettie Boorda**, was the ship's sponsor.

The destroyer is 504 feet long, with a beam of 59 feet and a 30.7-foot draft. Four General Electric gas turbine engines, generating 100,000 hp, drive the 8,300-ton ship to speeds in excess of 30 knots.

DDG 55's Aegis combat system includes: the AN/SPY-1D phased array radar; the MK-41 vertical launching system, which can fire a combination of up to 90 missiles against air, surface and underwater threats; the AN/SQQ-89 antisubmarine warfare system with bow and towed sonar arrays; Harpoon antiship missiles; MK-32 torpedo tubes; MK-15 Phalanx Close-In Weapons Systems; a five-inch rapid-firing deck gun; and the LAMPS MK-III helicopter control and landing system.

DDG 55 becomes the first Navy ship named to honor Rear Admiral **Herald F. Stout** (1903-1987), a heroic Navy destroyerman of World War II.

Navy christens 'Stout' at Ingalls

Ingalls has been building Aegis ships since 1978, when it was chosen as lead shipbuilder for the Ticonderoga (CG 47) Class of cruisers. The Litton division has delivered 16 of the 19 cruisers it has been contracted to build. Its first Aegis destroyer, Barry (DDG 52), has been delivered to the Navy and is scheduled for commissioning in December 1992. Ingalls is also building three Wasp (LHD 1) Class amphibious assault ships.

DDG 55
Equipment List

Main engines	GE
Propellers	Bird-Johnson
Reduction gear	GE
Shafting	Erie Forge
Generator engine	Allison
Generator	Kato
Engine controls	GE
Steering controls	Sperry Marine
Pumps	Blackmere Pumps
HVAC	York International
Deck machinery	Lakeshore
Coatings	Mobile Paint
Radar	GE, Magnetek
VHF/SSB radios	NESEA
Compass	Henschel
Loran	Litton

For additional information on the services available from Ingalls Shipbuilding,

Circle 21 on Reader Service Card

NEW VESSEL CONSTRUCTION

Private Shipyard

Shipyard	Navy No.	FY Program	Award Date	Vessel Name	Light Displ. Tons	Christen. Date	Est. Delivery
THE AMERICAN SHIP	T-AO-191	'85	11/16/89	Benjamin Isherwood	15,000	8/16/88	1/31/93
BUILDING COMPANY	T-AO-192	'85	11/16/89	Henry Eckford	15,000	7/22/89	9/30/93
TAMPA SHIPYARDS, INC	T-AGOS-23	'90	3/28/91	Impeccable	3,800		5/28/94
Tampa, Florida							
AVONDALE INDUSTRIES	T-AO-202	'89	10/06/88	Yukon	15,000	KL	11/30/93
New Orleans, Louisiana	T-AO-204	'89	10/06/88	Rappahannock	15,000	KL	10/27/95
	T-AO-199	'89	3/24/89	Tippecanoe	15,000	5/16/92	3/26/93
	T-AO-201	'89	3/24/89	Patuxent	15,000	KL	6/07/95
	T-AO-203	'89	3/24/89	Laramie	15,000		4/07/96
	LSD-49(CV)	'88	6/17/88	Harpers Ferry	11,894	KL	8/02/94
	LSD-50(CV)	'90	12/22/89	Carter Hall	11,894	KL	3/10/95
	LSD-51(CV)	'91	3/27/91	Oak Hill	11,894	KL	8/07/95
	MHC-53	'89	10/03/89	Pelican	885	KL	3/30/94
	MHC-54	'90	8/02/90	Robin	885	KL	10/07/94
	MHC-56	'91	3/29/91	Kingfisher	885		3/09/94
	MHC-57	'91	3/29/91	Cormorant	885		7/06/95
	T-AGS-45	'90	4/04/90	Waters	7,312	6/06/92	3/19/93
BATH IRON WORKS CORP.	CG-70	'88	2/25/88	Lake Erie	9,500	7/13/91	3/12/93
Bath, Maine	DDG-53	'87	9/25/87	John Paul Jones	8,300	10/26/91	6/25/93
	DDG-54	'89	12/13/88	Curtis Wilber	8,300	KL	9/30/93
	DDG-56	'89	12/13/88	John S. McCain	8,300	KL	2/24/95
	DDG-58	'89	12/13/88	Laboon	8,300		7/01/94
	DDG-60	'90	2/22/90	Paul Hamilton	8,300		12/02/94
	DDG-62	'90	2/22/90	Fitzgerald	8,300		4/28/95
	DDG-64	'91	1/16/91	Carney	8,300		9/29/95
	DDG-66	'91	1/16/91	Gonzalez	8,300		3/14/96
	DDG-68	'92	4/08/92	—	8,300		9/18/96
	DDG-70	'92	4/08/92	—	8,300		3/19/97
	DDG-72	'92	4/08/92	—	8,300		9/17/97
GENERAL DYNAMICS CORP.	SSBN-739	'87	5/26/87	Nebraska	12,500	8/92	7/—/93
ELECTRIC BOAT DIVISION	SSBN-740	'88	1/05/88	Rhode Island	12,500		7/—/94
Groton, Connecticut	SSBN-741	'89	10/05/88	Maine	12,500		8/—/95
	SSBN-742	'90	10/18/89	Wyoming	12,500		8/—/96
	SSBN-743	'91	12/19/90	—	12,500		8/—/97
	SSN-761	'86	3/21/86	Springfield	6,000	1/92	12/—/92
	SSN-762	'86	3/21/86	Columbus	6,000	8/92	6/—/93
	SSN-763	'86	3/21/86	Santa Fe	6,000	KL	12/—/93
	SSN-768	'88	6/30/88	Hartford	6,000	KL	12/—/94
	SSN-771	'89	12/14/88	Columbia	6,000		6/—/95
	SSN-21	'89	1/09/89	Seawolf	9,150		5/—/96
	SSN-22	'91	5/03/91	—	9,150		6/—/97
INGALLS SHIPBUILDING, INC.	CG-71	'88	2/25/88	Cape St. George	9,500	1/10/92	3/29/93
Pascagoula, Mississippi	CG-72	'88	2/25/88	Vella Gulf	9,500	6/13/92	6/28/93
	CG-73	'88	2/25/88	Port Royal	9,500	KL	1/31/94

Shipyard	Navy No.	FY Program	Award Date	Vessel Name	Light Displ. Tons	Christen. Date	Est. Delivery
INGALLS (cont)	DDG-52	'87	5/26/87	John Barry	8,300	5/10/91	10/19/92
	DDG-55	'89	12/13/88	Stout	8,300	KL	3/25/94
	DDG-57	'89	12/13/88	Mitscher	8,300	KL	8/05/94
	DDG-59	'90	2/22/90	Russell	8,300	KL	11/11/94
	DDG-61	'90	2/22/90	Ramage	8,300		3/10/95
	DDG-63	'90	2/22/90	Stethem	8,300		7/14/95
	DDG-65	'91	1/16/91	Benfold	8,300		12/01/95
	DDG-67	'91	1/16/91	Cole	8,300		5/03/96
	DDG-69	'92	4/08/92	—	8,300		10/11/96
	DDG-71	'92	4/08/92	—	8,300		3/21/97
	LHD-3	'88	11/23/87	Kearsarge	28,500	KL	5/28/93
	LHD-4	'89	10/03/88	Boxer	28,500	KL	10/07/94
	LHD-5	'91	12/20/91	Bataan	28,500		5/16/97
INTERMARINE USA	MHC-51	'86	5/22/87	Osprey	895	3/23/91	1/22/93
Savannah, Georgia	MHC-52	'89	2/17/89	Heron	895	3/21/92	6/25/93
	MHC-55	'90	4/01/91	Oriole	895	KL	9/20/94
	MHC-58	'92	4/22/92	—	895	KL	9/22/95
	MHC-59	'92	4/22/92	—	895		11/22/95
	MHC-60	'92	4/22/92	—	895		1/22/96
McDERMOTT SHIPYARDS	T-AGOS-21	'89	10/07/88	Effective	2,486		12/10/92
Morgan City, Louisiana	T-AGOS-22	'89	10/07/88	Loyal	2,486		6/11/93
NATIONAL STEEL AND	AOE-6	'87	1/23/87	Supply	19,700	10/06/90	4/01/93
SHIPBUILDING COMPANY	AOE-7	'89	11/03/88	Rainier	19,700	9/28/91	4/25/94
San Diego, California	AOE-8	'90	12/06/89	Arctic	19,700		11/28/94
NEWPORT NEWS	SSN-765	'87	2/06/87	Montpelier	6,000	4/—/91	—/93
SHIPBUILDING	SSN-766	'87	2/06/87	Charlotte	6,000	10/03/92	1/—/94
Newport News, Virginia	SSN-767	'87	2/06/87	Hampton	6,000	9/—/91	8/—/93
	SSN-769	'88	6/10/88	Toledo	6,000		—/95
	SSN-770	'88	6/10/88	Tucson	6,000		—/95
	SSN-772	'89	12/14/88	Greeneville	6,000		—/96
	SSN-773	'90	11/28/89	Cheyenne	6,000		—/96
	CVN-74	'88	6/30/88	John C. Stennis	91,000		12/—/95
	CVN-75	'88	6/30/88	United States	91,000		—/98
PETERSON BUILDERS, INC.	MCM-10	'86	2/14/89	Warrior	1,262	12/08/90	11/20/92
Sturgeon Bay, Wisconsin	MCM-11	'86	2/14/89	Gladiator	1,262	6/29/91	6/04/93
	MCM-12	'90	12/12/89	Ardent	1,262	11/16/91	8/20/93
	MCM-13	'90	12/12/89	Dexterous	1,262	6/20/92	11/05/93
	MCM-14	'90	12/12/89	Chief	1,262	KL	7/08/94
TRINITY INDUSTRIES	T-AGS-60	'90	1/30/91	Pathfinder	3,019	KL	10/30/94
New Orleans, Louisiana	T-AGS-61	'90	1/30/91	Sumner	3,019		5/01/95
	T-AGS-62	'92	5/29/92	Bowditch	3,019		11/29/95

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Bush Signs Defense Bill, Loses $7.5 Billion But Gains Three Ships

The White House recently signed a $253.8-billion Defense Appropriations Bill that gives President **Bush** $7.5 billion less and three ships more than requested.

Shipbuilding and conversion is the only one of the Navy's four accounts that received an increase from House appropriators and authorizers, increasing from $5.3 billion to $6 billion. Congress also agreed to build a sixth LHD-1 amphibious assault ship, which would have added $900 million to the total appropriations figure, but a compromise was reached that delays paying for three-fourths of the ship.

Along with the LHD-6, Congress decided to fund two other ships that the Pentagon did not ask for, $300 million each for an AOE-6 fast fleet support ship and an LSD-41 amphibious assault ship.

In other shipbuilding, $3.25 billion was appropriated for four DDG-51 destroyers. The CVN-76 nuclear aircraft carrier got $832 million for fiscal year 1995 procurement, after Senators agreed not to target the program for FY 1996.

Both authorizers and appropriators gave the Pentagon $613 million for strategic sealift, half of what it asked for. Along with $1.88 billion in previously appropriated but unspent money, the Pentagon was told to start the "National Defense Sealift Fund." The revolving account is to be used solely for shipbuilding and conversion and is outside the procurement budget.

Deactivating Nuclear Ships Will Cost Billions

A report from the environmental protection group Greenpeace, entitled "Naval Nuclear Propulsion After the Cold War," states that billions will be paid to deactivate the world's nuclear-powered combatants through the end of this century.

The paper estimates that the decommissioning of 100 U.S. nuclear submarines from now until the year 2000 will require $2.7 billion. A recent General Accounting Office (GAO) report put the cost of decommissioning each submarine at $40 million.

The Greenpeace report also states that 150 Russian nuclear submarines are due for disposal by the year 2000, which, when using the GAO figure of $40 million per vessel, means that decommissioning all 250 U.S. and Russian submarines represents $10 billion in business. Adding to the total decommissioning cost will be the disposal of both navy's nuclear-powered surface ships.

The Greenpeace reports notes that half of the world's nuclear reactors are at sea, and the ships containing them have an average service life of 30 years.

Navy Christens Nuclear Sub At Newport News Shipyard

The U.S. Navy's latest improved 688-class (I688) nuclear attack submarine, the U.S.S. Charlotte, was christened at Newport News Shipbuilding and Drydock Company, Newport News, Va. She is the 55th of 62 planned 1688 type attack submarines.

Pentagon's Contractor Recouptment Law Ended

The long-standing Pentagon requirement for defense contractors to pay back government research money when they sell a defense-derived product on the civilian market has been eliminated.

While President **Bush** declared earlier this year the end of "recoupment" for all new Pentagon contracts, **Donald Atwood**, the Deputy Defense Secretary, recently ended the recoupment provision on all existing contracts.

The government policy change is not retroactive, sales already consummated will not be affected and rebates will not be allowed for previous recoupment payments.

(For additional U.S. Navy-related news, please see page 60.)

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Marine Pollution And Safer Ships

Implications For The Tanker Industry

Despite a marked improvement in the overall safe handling of oil shipped by sea, major spills are still occurring. The cost of such incidents to oil companies and the shipping industry has been immense, not only in cash terms but also regarding legislative regulation and consequential cost.

With rising ship casualties, the period 1990-92 has seen considerable change in maritime regulations relating to maritime safety and pollution. The upheaval truly began on August 18, 1990, when President **George Bush** signed the 1990 U.S. Oil Pollution Act (OPA). Within nine months came the establishment of the first international framework for the introduction of double hulls on all new tankers and the gradual phasing-out of single hulls on existing vessels. The changes, adopted at a session of the Marine Environment Protection Committee in March 1992, also added two extra regulations (13F and 13G) to the MARPOL 73/78 document.

In order to achieve an improvement in tanker safety and marine pollution, it is vital that substandard tonnage is deleted from the world fleet quickly, that the existing fleet is made safe and that newbuildings are built to a very high specification. The IMO is placing a great deal of emphasis on making inspection procedures more rigorous in order to weed out poor tonnage before it reaches compulsory retirement age. However, there are a number of serious flaws in the way inspections are currently carried out and certificates issued which suggest that at present a wholesale pruning of the tanker fleet is unlikely:

- The present high number of classification societies and the harshly competitive environment in which they operate is likely to ensure that the high proportion of substandard tonnage which is undoubtedly operating is likely to receive certification from one society or another.
- There are at present too many surveys and inspections, many of which duplicate each other.
- There is a widespread feeling today that the historical confidence that classification societies will certify only safe and seaworthy vessels is no longer universally accepted.

Whether substandard tankers are weeded out or not, the major problem of crewing standards still remains largely untouched. As many as 90 percent of all marine disasters may be attributable to human error of one kind or another, yet this subject continues to receive precious little attention. So bad is the problem that a growing body of experts is claiming that working practices aboard vessels are becoming as substandard as the aging world tanker fleet. Only when all shipowners take, or are forced to take, the responsibility to ensure that their vessels are manned by a properly qualified crew will the situation improve.

Ship Design

The issue of which design offers the best protection in the event of an accident—the conventional narrow-span double hull or the Mitsubishi-sponsored "Double Sides, Mid-Deck"—remains unresolved. The lack of non-contentious data makes for differing interpretations of test results. In a situation where neither design would appear to do both, is it better to have a system that produces zero pollution for a large number of small incidents or one that may produce a little pollution in the majority of incidents but is likely to prove more effective in the "Valdez"-type scenario which captures world media attention and focuses great attention on the tanker industry? This basic problem is exacerbated by political and economic factors, most notably recent Japanese-U.S. economic squabbles. Nonetheless, it seemed harsh, to say the least, not to grant the Japanese-based mid-deck design equivalency under OPA '90 given the results of tests carried out in both Japan and the United States.

Fleet Development

Regardless of environmental legislation, the aging nature of the tanker fleet will dictate a major replacement program towards the turn of the century. The likely extent to which this natural replacement program will be accelerated by increasingly stringent environmental legislation can be split into two distinct scenarios:

(a) Main Case: Given the current flaws in inspection procedures, it seems unlikely that the natural replacement program will be speeded up by the IMO's rulings. Unless vessels are prematurely retired by the classification societies, existing vessels can trade until a minimum of twenty-five years of age, above the average life expectancy of a tanker. In fact, recent IMO legislation could have the opposite effect to that intended. Rather than ridding the world fleet of substandard tonnage, the decision to allow vessels to trade until they are 25 or 30 years of age could encourage owners of old, poorly maintained tonnage to "patch up" their vessels.

(b) Lower Case: The lower case situation hypothesizes that a far more rigorous inspection program comes into being. Were such a system to emerge, the environmental legislators could have a significant effect on the development of the world tanker fleet in years to come, given reports of the level of inadequate tonnage still presently trading. BP, for instance, stated in March 1992 that it regarded 40 percent of the current VLCC fleet as unacceptable for charter. Taking such a proportion out of the world fleet would have significant ramifications.

The true position is likely to be somewhere in the middle of the spectrum. While it is unlikely that changes will occur overnight, it is possible that there will be a progressive schedule whereby tonnage is barred with increasing severity from the world tanker market as it gradually becomes harder to obtain certification.

Table 1 shows the potential supply/demand balance of the world tanker market if such an increasingly stringent inspection regime was created. It can be seen that the supply/demand balance would tighten considerably and even show an overall deficit in 1997.

Table 1: Potential Tanker Surplus/(Deficit)

Size Range (dwt)	'92	'93	'94	'95	'96	'97
10-45,000	5.4	5.3	5.0	4.5	3.8	2.5
45-90,000	(1.1)	(0 7)	(1.2)	(2.7)	3.6)	(5.6)
90-175,000	10.7	11.3	9.4	5.7	0.1	(6.8)
175,000+	32.5	34.7	34.2	29.0	17.4	2.7
	47.5	50.6	47.4	36.5	17.7	(7.2)

Source: Drewry Shipping Consultants Ltd.

In reality, though, it is unlikely that such a major proportion of the fleet would be ousted in such a relatively short period of time. Even if such a situation was to emerge, there would most likely be an accompanying increase in newbuilding levels to offset potential shortages, a strategy that would be fostered by increasingly lucrative freight rates.

Costs, The Market And Profitability

Inflation, together with other forces operating in the newbuilding market will dictate that newbuilding prices, regardless of whether vessels are single-hulled or double-hulled, will rise steadily towards the turn of the century.

In addition, though, legislation will force prospective owners to pay a premium for a double-hulled vessel. During the period 1990-91 the price differential between a single and double-hulled tanker was in the region of 20-25 percent. With all R&D likely to be channelled into double hull innovation now that single hulls have had an effective scrap-by date put on them, it is possible that by 1996 the premium payable could have slipped to as low as 10 percent.

To the increased capital outlay to meet new anit-pollution regulations for newbuildings and existing tonnage must be added the increasing cost levels that will be needed to cover higher quality ship operation. Repairs and maintenance costs will increase to meet new stringent survey requirements; improved standards of shipboard management will inevitably mean increased manning costs; whilst the level of H&M, P&I and TOVALOP premia are under strong upward pressure. This has led one shipowner to forecast that insurance costs will become the most expensive component in operating costs. The pattern is being repeated to some extent in port costs, where Port States are seeking to recover extra costs arising from greater emphasis on safe navigation and safe handling of oil. In conclusion, shipping is on the threshold of a sustained period of added expense.

For further information regarding "Marine Pollution and Safer Ships: Implications for the Tanker Industry", or enquiries about review copies, please contact:

Drewry Shipping Consultants Ltd.
11, Heron Quay, London E14 4JF.

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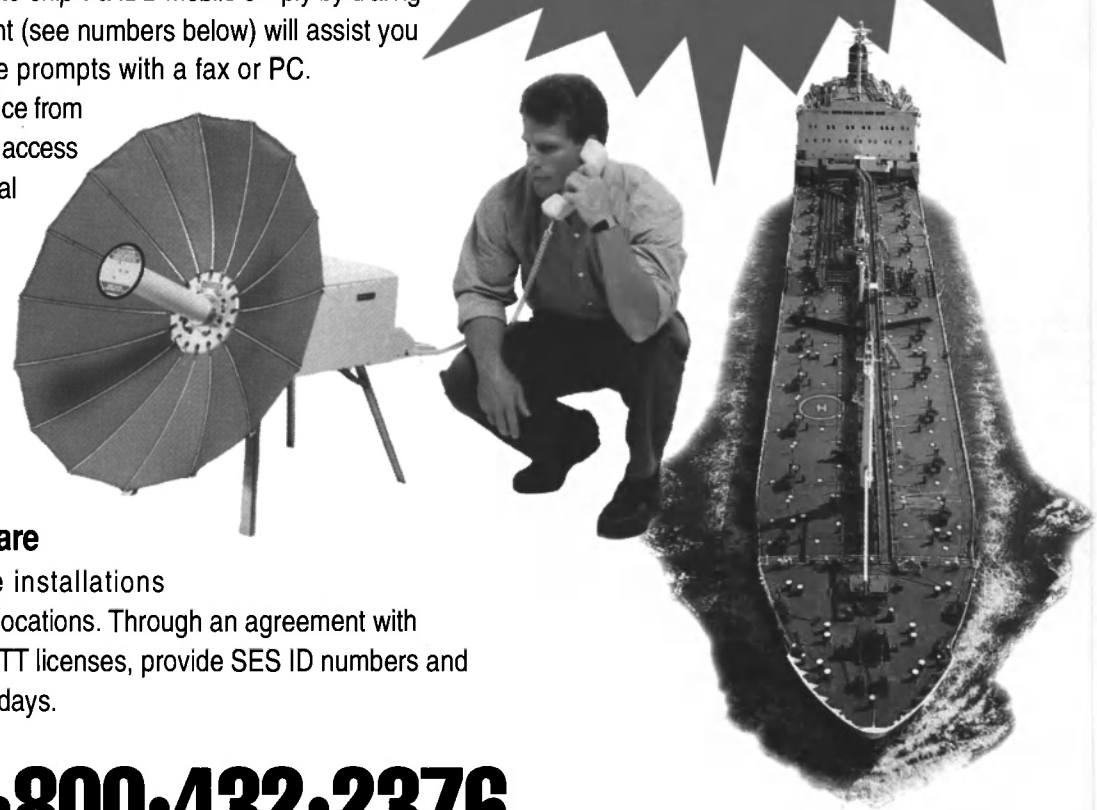

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The "Vindile" features MTU propulsion

European Fast Ferry Market Is Picking Up Speed

By Marcus Gibson, journalist

The long-awaited scramble for big fast ferries from Europe's operators has begun.

More ships have been ordered or become the subject of bids over the past month (October) than in the rest of 1992. The recent drive is certain to make 1994 the year when the fast ferry comes of age.

Fast ferry developments on the western Channel routes have never been brisker.

The Weymouth-based company Condor has bought a new $15 million, 74-meter long SeaCat from the Tasmania, Australia, yard of International Catamarans. Delivery is scheduled for February 1993. A second SeaCat is on order but the company has also announced that it will lease a second SeaCat from Sea Containers until it arrives.

Condor has also expressed an interest in purchasing an uprated 87-meter SeaCat design, able to carry 800 passengers and 170 cars.

How is Condor, a medium-sized fast ferry company with routes from Weymouth to the Channel Islands and St. Malo in France, able to finance the newbuildings?

Fifty percent of the shares in Condor have been purchased by Australian transport giant, TNT, a company which employs 50,000 worldwide.

Analysts say TNT bought Condor as a springboard to greater things, not merely its Channel Island licenses.

"The routes with the fastest growth potential are all in the western Channel," said **Alan Blunden**, editor of Fast Ferry International.

The lucrative Portsmouth-to-Cherbourg route, which is popular with affluent British families that own second homes in France and make about three trips per year, is Condor's most likely choice of home port for its new fleet.

Most dramatic have been the moves made by Stena Sealink. The company has become the first blue-chip shipowner to invite tenders for an entire fleet of large, high-speed car carriers. Despite denials from Stena AB, the parent company in Sweden, just six yards around the world out of an initial 25 are still in the running to build Stena's own design for a 124-meter long, 40-meter wide, gas turbine-driven ferry capable of carrying approximately 1,500 passengers.

"It is an open secret," said a key source, speaking on the condition of anonymity, "the order is for 10 ships, with a key requirement of operating all year round and in all weathers."

Mats Kling, managing director of Stena AB, refused to confirm that Stena had called for bids or comment on suggestions that it intended to deploy the fleet in the Baltic in the summer and on Channel routes during the winter.

"Stena is a company in a hurry," said one analyst, "afraid that new small operators will emerge with one or two fast ferries and cream off the most profitable traffic on its routes."

No yard has yet to publicly acknowledge an interest in making the Stena bid.

"The first good bid will get the contract," said Mr. **Blunden**. Yet rumors persist that some yards are wary of working for Stena, which has a reputation of being a demanding client.

The Waiting Game

Two factors may encourage Stena to halt any current negotiations and wait another year.

First, full passenger service on the Channel Tunnel has been delayed at least another year from the earlier opening date of June 1993. Second, economic stagnation in the U.K. looks certain to continue past the summer of 1994.

Sea Container's **James Sherwood** had been expected to place an order for a larger SeaCat craft now that the Tasmanian yard has been extended.

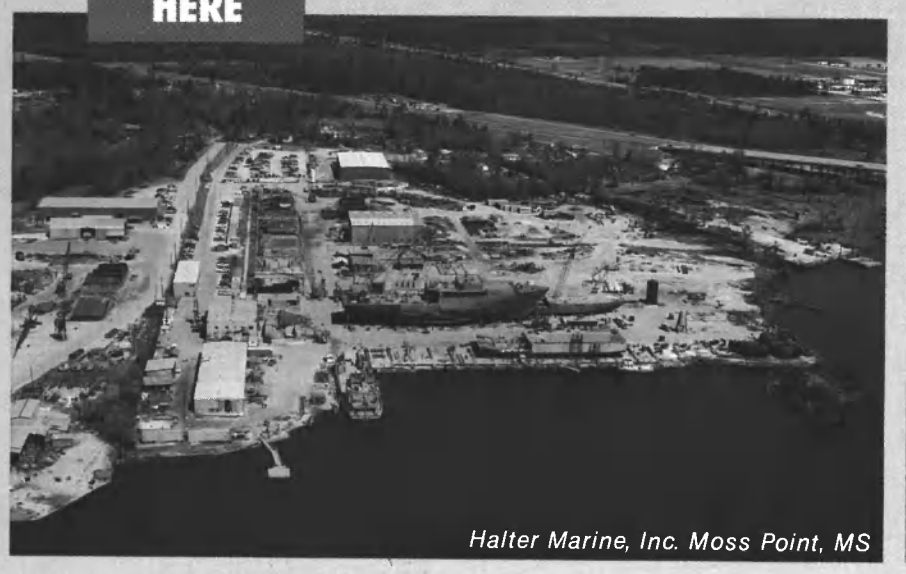
Some analysts say the delay is thought to be due to final contract wrangling. Over the past two years, **Sherwood's** Hoverspeed SeaCats have effectively taken market share from other Channel operators, especially P&O.

Sherwood's new Belfast-to-Stranraer route across the Irish Sea is a real moneyspinner. The service, which runs from one city center to another in 90 minutes, has caused dismay among conventional operators, including Sealink, on the route.

In southern Europe, progress has moved ahead as rapidly as in the north. In September, out of the blue, Spain entered the fast ferry

We can build your next boat or barge.

HERE



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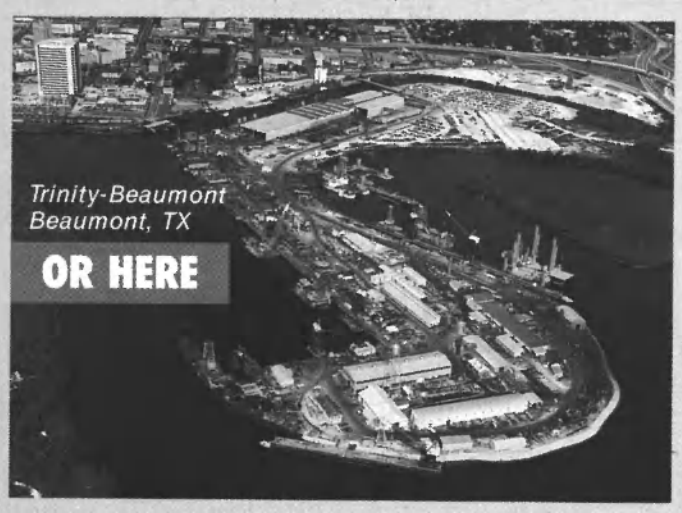

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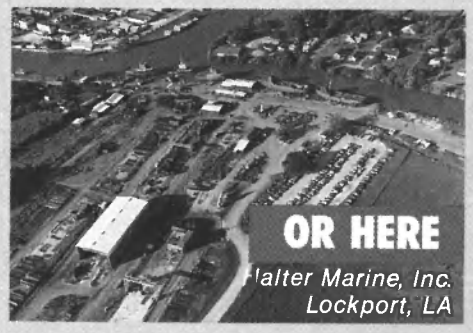

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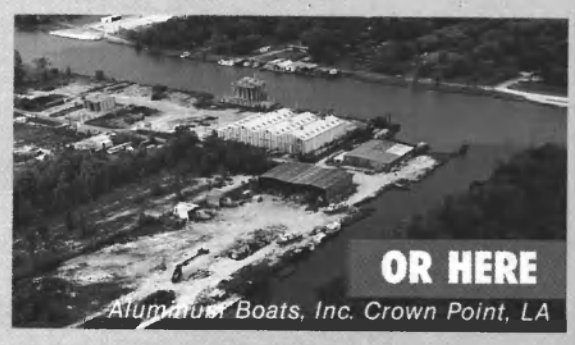

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And we will build it quickly, to the highest quality, at competitive prices.

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Circle 252 on Reader Service Card

market for the first time.

State operator Trasmediterranea ordered two large, car-carrying fast ferries from the local yard in Bazan. First reports say the 98-meter monohull design appears similar to Western Marine's Ocean Flyer.

Italian shipbuilder Rodriguez Cantieri Navali has unexpectedly sold its first sleek Aquastrada high-speed monohull to Tirreina, the Italian state ferry operator. Initially the ship had been built for Rodriguez's own operator subsidiary because a buyer could not be found.

The Tirreina deal, which includes an option on a second Aquastrada, more than compensates. It is worth $60 million.

The launch of the first Aquastrada has been brought forward to March 1993, with engineers predicting a 50-knot maximum speed and a 37-knot service speed, with a comfortable ride maintained even in bad weather.

They also report that the design can accommodate, without difficulty, a second vehicle deck for an extra 150 cars.

Time To Buy

The cause of the European rush to buy are manifold. The last two months of the year are traditionally a period of hectic activity between big ship owners and builders, as operators try to get an order placed in time for the summer season 18 months ahead. A delay now would make it impossible for operators to put the new ships into service before the highly profitable 1994 summer season.

If the purchasing window is missed, owners will be forced to wait another nine months, as there is no point in taking delivering during the slack winter months.

Europe's coastlines are literally bristling with fresh route opportunities ideal for fast ferries.

Sea Container's Mr. **Sherwood** is known to have been tempted by untapped routes in the eastern Channel. He may put a SeaCat on a potentially lucrative route between Dover and Flushing, or to a nearby Dutch port, cutting the present journey time from eight to 2.5 hours.

Alternatively, other operators are keen to start a service between Holland and the major U.K. ferry port of Tilbury on the Thames estuary, because travel times are likely to be shorter than going via France and the Channel Tunnel. Harwich-to-Holland routes are considered too long and too rough for existing fast ferry types.

However, speculation this summer that both the Sally Line and P&O would order a fast ferry this year have proved premature. P&O seems content with a completely different strategy: to invest millions in large conventional ferries and supply a no-wait, no booking, continuous shuttle service to customers, and thereby compete head-on with new fast ferries and the Channel Tunnel.

Safety

Last month the Mediterranean witnessed one of the most potentially disastrous accidents involving a fast ferry when a Greek craft hit the breakwater at Piraeus at 40 knots, apparently attempting to beat a conventional ferry into dock.

The impact-absorbing qualities of composite sandwich material ensured that of the 170 passengers, only 10 suffered superficial injuries.

The vessel developed a 20-degree list but was successfully beached. Two-thirds of the hull was severely damaged; a steering problem caused by a waterjet failure was claimed. On examination, however, engineers found the waterjets in good working order.

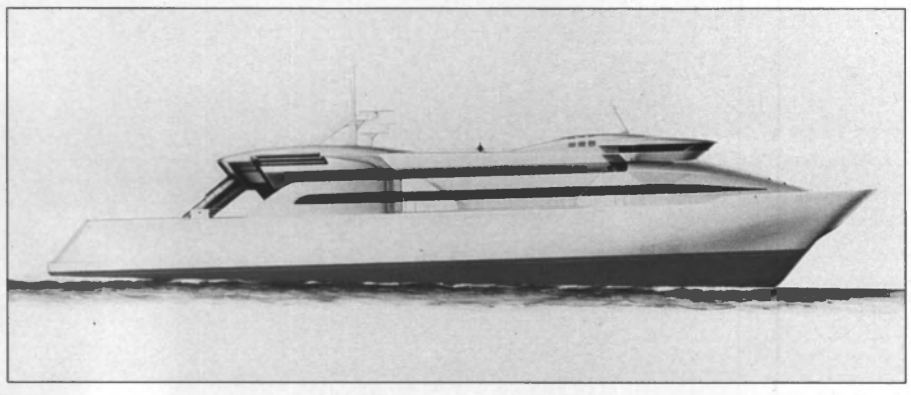
Rodriguez managing director **Alcide Sculati** recently emphasized the high safety standards of new fast ferries, especially their seaworthiness and collision-avoidance maneuverability.

"The Aquastrada can perform a crash stop from full speed in only three ships' lengths," he said. "This is a remarkable improvement on conventional vessels."

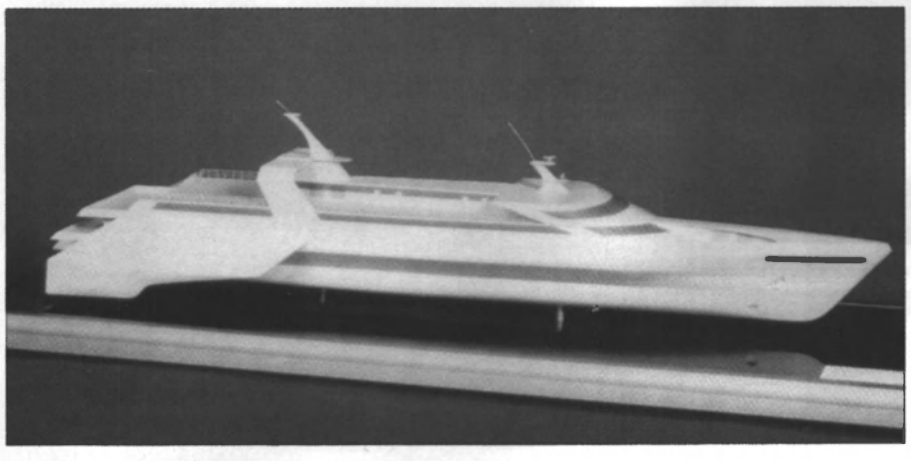
The prototype 40M Flying Cat "Kommandoren," from Kvaerner, was delivered in April 1990. Recent orders for the 40M Flying Cats, to be built at the Kvaerner Fjellstrand Singapore yard, include three 262-passenger/38-knot ferries scheduled for service between Hong Kong and Shenzhen airport. Deliveries are scheduled for 1993.

Yards Enhance Designs, Prepare For Future Fast Ferry Orders

If the end of 1992 is any indication of where the fast ferry market is headed, the picture does indeed look rosy. Builders across the world are quickly formulating new designs and plans to build fast ferries, in anticipation of higher demand. This trend could bode well especially for suppliers of gas turbines, high and medium speed diesels, and water jet manufacturers, as most of the new fast ferries plan to be using these types of propulsion.



The SEC 750 Surface Effect Ship (SES) car/passenger ferry will be powered by GE LM2500 gas turbines. A service speed of 45 knots is derived from the waterjet propulsion plant. To be built at the Societa Esercizo Cantieri shipyard (SEC), the SEC 750 is one model of four, and is designed to carry 750 passengers and 200 cars. The largest model, the SEC 1500, is designed to carry 1,500 passengers and 400 cars.



A computer model of a proposed 100-meter, 40-knot fast ferry from Ateliers Et Chantiers du Havre (ACH). The vessel, which has yet to be ordered, is designed to accommodate 450 passengers and 150 cars. ACH has plans available for a variety of sizes, from 25 to 150 meters. The 100-meter version is designed to be 28 meters wide, with a 2.6-meter draft, and be propelled by two gas turbine engines and two steerable water jets, each generating approximately 15,000 kW.

Australian builder International Catamaran, which introduced the 74-meter long SeaCat in 1990, capable of transporting 450 passengers and 84 vehicles, is currently reworking that vessel to an 86 meter version in hopes of doubling the passenger capacity to 900, and providing room for nearly 150 cars.

Societa Esercizio Cantieri (SEC) of Italy sports an entire line of surface effect ship (SES) fast ferries, designed in a number of models and sizes. Available to order is the SEC 350, capable of holding 350 passengers and 70 cars; the SEC 450, 450 passengers and 100 cars; the SEC 750, 750 passengers and 200 cars; and the SEC 1500, 1,500 passengers and 400 cars. The SEC 750, which is powered by GE LM2500 gas turbine engines, will be delivered next year for service between Italy's mainland and Corsica, and is planned to have a service speed of 45 knots.

Another Italian yard, Rodriguez Cantieri Navali, offers its 331-foot long "Aquastrada" car/passenger ferry. The vessel features a CODAG propulsion system consisting of a GE LM2500 gas turbine and two MTU 16V 595 TE70 engines. Able to carry between 400 and 500 passengers and between 150 cars, the vessel will have a service speed of 40 knots when fully loaded and a range of 400 nautical miles when standard fuel tanks are full.

German builder Blohm + Voss has also entered the fray, entering its Corsair series for consideration. Available are the Corsair 300, Cor-

sair 600 or Corsair 900, each constructed with high strength, low weight material to help reduce corrosion and increase speed. The 60-meter long Corsair 600 will have a capacity to carry approximately 800 passengers and 50 cars. The gas turbine-powered water jet propulsion system is expected to provide a service speed of 40 knots.

Norwegian-based Kvaerner group, which launched the 40M Flying Cat in 1990, has received several orders for new 40M Flying Cats due for delivery through 1993.

Three 262 passenger, 38-knot 40M Flying Cats will be in service between Hong Kong and the Shenzhen airport by late 1993. The vessels are to be built in the Kvaerner Fjellstrand Singapore yard. Scheduled for delivery in January is a 400-passenger version of the 40M Flying Cat, which is planned to have a service speed of 33 knots from twin MTU 16V engines, driving KaMeWa waterjets.

KaMeWa Establishes New Fort Lauderdale, Fla. Office

KaMeWa, a world leader in marine propulsion technology, strengthens its international profile with the opening of its new Fort Lauderdale, Fla. sales office.

KaMeWa pins its success on the international market to several factors, including its ability to meet the service and price needs of customers, as well as its advanced marine laboratory for hydrodynamic research. KaMeWa customers are supported by qualified technicians in more than 20 service units around the world. The company offers a complete range of controllable-pitch and fixed-pitch propellers, to highly skewed types for low vibration/pressure pulse levels and quiet running, to supercaviating propellers for high speed craft, and shock resistance and ice strengthened propellers up to Arctic standards.

KaMewa also manufactures rotatable thrusters, used for propulsion and positioning of semi-submersibles, drill ships, diving support vessels, supply boats and tugs, as well as merchant vessels.

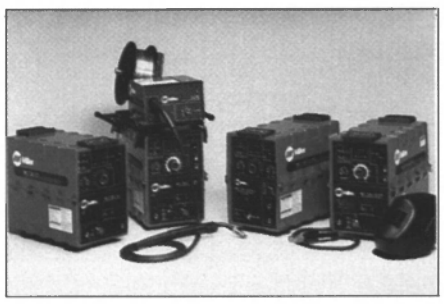
In the field of water jet propulsion, the company is an acknowledged technical leader. Earlier this year three KaMeWa 20,000 hp water jets powered the racing yacht, Destriero, on its record-breaking Blue Riband transatlantic run. Finally, KaMeWa also designs and produces electronic remote control load control, joystick and auxiliary equipment.

For complete information on KaMeWa and its product line,

Circle 77 on Reader Service Card

XMT Portable Welder From Miller Electric Features 'Auto-Link'

XMT Series inverter welding power sources now have Auto-Link, a unique Miller Electric feature which makes the unit easier to install and use. The features allows the unit to require no manual primary voltage relinking, as operators can power up and weld using any of the three primary voltages: 208v single phase; and 230v or 460v single or three phase. Voltage adjusts automatically on three models, XMT-300 CC/CV, CC/TIG and 300 CC.



Miller Electric's XMT Inverter welding power source.

Units provide up to 200 or 300 amperes of constant current or constant current/constant voltage DC output, depending on the model, weigh between 72 and 84 pounds, and come in a fiberglass case. The units feature solid state power and control circuitry, a cooling system which exchanges all air through the rear of the unit to reduce contaminants drawn through the power source and digital meters.

For informationtric on the XMT,

Circle 60 on Reader Service Card

Admiralty Lubricants Introduces Environmentally Safe Degreaser/Cleaner

Admiralty Lubricants, Ltd., of West Babylon, N.Y., has developed an environmentally safe degreaser/cleaner called Admiral-Clean, a non-toxic, non-flammable and non-caustic system of surface active agents (surfactants) and oil solubilizers which desolve grease and grime into microscopic droplets.

When used in a pressure washer or in conjunction with agitation, usually brushes or brooms, the surfactants in Admiral-Clean penetrate the contaminates. This causes the oil to disperse into droplets, which are more vulnerable to natural biodegradation and can be dispersed by dilution in water. Admiral-Clean is 99.98 percent biodegradable within seven days when used as an oil dispersant.

Admiral-Clean can be used with most Msd systems and oily water separators. When Admiral-Clean is left in a storage tank with oily water, most of the oil floats to the surface where it may be skimmed off, reducing the amount of oily water disposal.

According to the company, Admiral-Clean has no associated health or environmental hazards and is so safe to work with that standard eye protection or ventilation precautions are not required.

For more information about Admiralty Lubricants,

Circle 69 on Reader Service Card

Kingsbury Opens New Service Facility

Kingsbury, Inc., an original thrust bearing manufacturer, has opened a facility dedicated to the service and repair of fluid-film thrust and journal bearings.

The new facility is part of Kingsbury's commitment to provide the most reliable and time efficient bearing service.

The facility provides a wide range of services for bearings of any make or size. Kingsbury offers rebuilding, upgrading and replacement, in addition to complete repair services such as turning, milling, boring, babbitting, lapping and welding.

Kingsbury service engineers and repair technicians who will staff the new facility can provide design support for field retrofits or modifications, as well as on-site consultation and service.

The program is backed by Kingsbury's main manufacturing plant in Philadelphia.

For additional information on the new Kingsbury facility or any Kingsbury product or service,

Circle 45 on Reader Service Card

Dimmling Receives Thomas Crowley Trophy

Crowley Maritime Corporation has announced that the company's highest honor was accorded to **Arno Dimmling**, vice president and general manager, land operations for Crowley American Transport, a Crowley subsidiary. He received the Thomas Crowley Trophy.

The trophy is awarded for outstanding performance and demonstration of excellence through dedication, perseverance, leadership, initiative, imagination and team spirit, making a major contribution to the success of the company and its quality assurance programs.

Mr. **Dimmling** received the trophy, a bronze sculpture depicting a replica of the 18-foot Whitehall boat Thomas Crowley acquired in 1892 to start the company, from the founder's son, **Thomas B. Crowley Sr.**, current chairman and chief executive officer of Crowley Maritime.

In his current position, Mr. **Dimmling** is responsible for the line and staff management of all land operations functions for Crowley American Transport.

These functions include freight services, terminals, stevedoring, trucking and intermodal, M&R, industrial engineering, equipment control, facilities security and the entire container and trailer fleet.

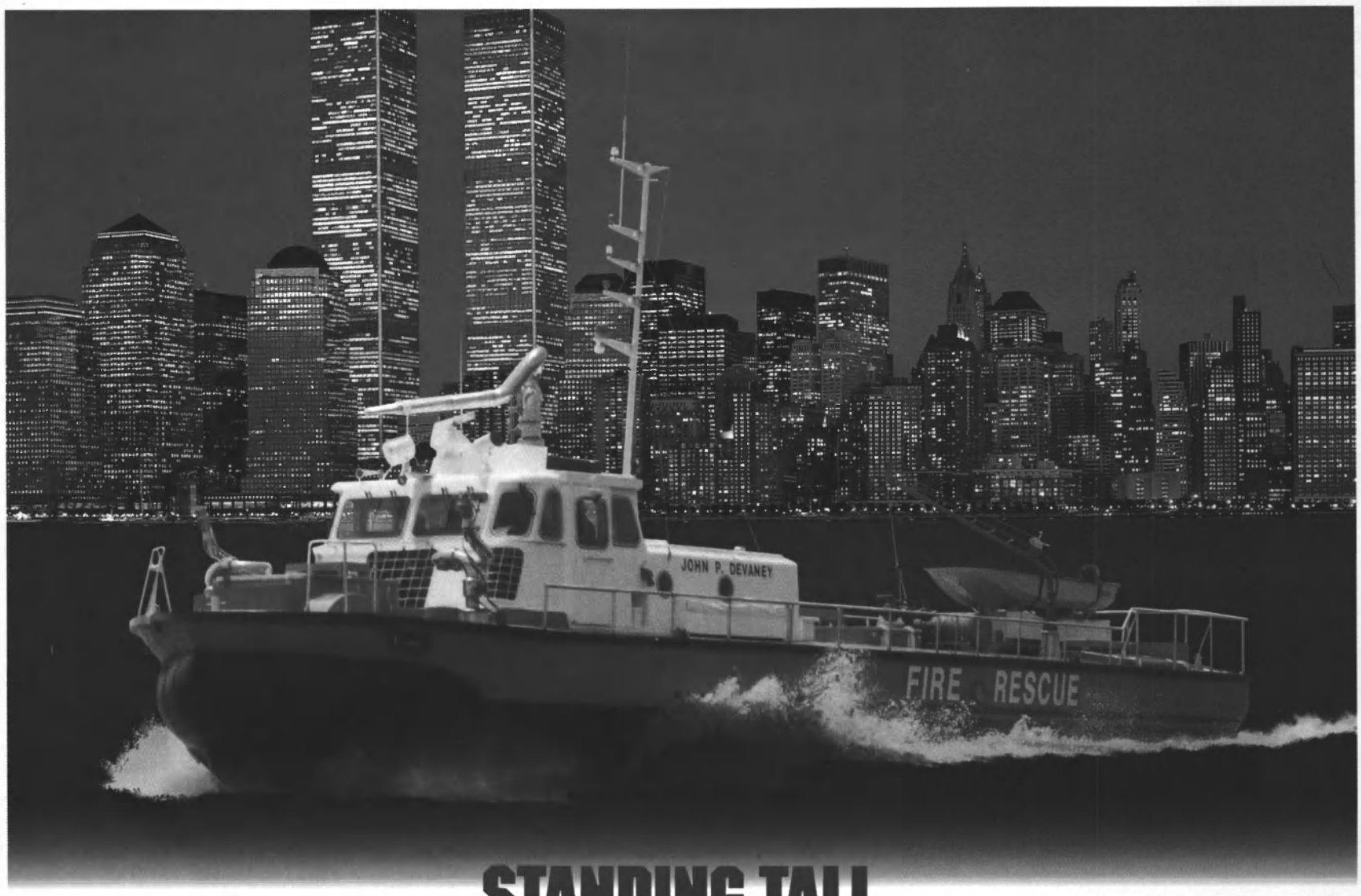
Pepsico Joint Venture To Sell Ukrainian-Built Vessels, Update Zaliv Yard

PepsiCo, Inc. has signed an agreement with two Ukrainian partners and independently-owned Fram Shipping, Ltd., to establish a joint venture to market $1 billion worth of Ukraine-built commercial ships over an eight-year period.

The deal is PepsiCo's first in the shipping market. The deal will pool a broad spectrum of shipping, soft drinks and food service under the one operating enterprise, Ukrainian Development Corporation. It gives the soft drink manufacturer the chance to triple drink sales in Ukraine and establish up to 100 Pizza Hut restaurants through exchange credits generated from ship sales.

The Ukrainian Development Corporation, with an office in Kiev, will market the commercial ships from the Zaliv Shipyard. The first three to be marketed are 68,000-dwt double-hull product tankers. Zaliv was the first shipyard from the former Soviet Union to manufacture such ships.

The joint venture also includes a comprehensive program to fully modernize the commercial sector of the Zaliv Shipyard, making it the first to do so since the break up of the former Soviet Union. Major investments in training, state-of-the-art manufacturing equipment, design technology and modern management practices are scheduled.



STANDING TALL IN THE BIG APPLE.

NEW SES MULTIPURPOSE FIRE & RESCUE CRAFT ESCORTS LEAD SHIP IN JULY 4TH TALL SAILING SHIPS PARADE.

While celebrating the past, New Yorkers got a view of the future when the first of two Textron Marine Systems' fire and rescue craft sailed up the Hudson River with the tall ships commemorating Columbus' voyage to America.

Built by Textron Marine Systems, the 70-foot craft, named for fire fighter, John P. Devaney, represents a new era in ship and pier fire fighting and harbor rescue. The new boats are the first additions to New York's fireboat fleet in 31 years.

A surface effect ship (SES) design, the craft rides on a cushion of air trapped between flexible bow and stern seals and rigid catamaran-style side hulls. This technology provides high-speed capabilities to respond nearly four times faster than conventional fireboats. Able to operate in extremely shallow water, the new SES craft reduces total fireboat inventory requirements. Other operating costs are kept low through fuel-efficient diesel engines and small crew sizes.

The craft is equipped with five monitors which deliver as much as 5,500 gallons per minute and are remotely operated from inside an enclosed wheelhouse by one crew member, using an automated fire-fighting system. Total crew requirements range from three in the wheelhouse to three to six on deck. Rescue equipment, navigational and communications aids and pumping systems on the new craft all represent the latest in fire-fighting technology.

Like New York, any harbor-based city benefits from swift response across water in emergency situations. Tall ships come and go, but New York City's SES fireboats will lead the way in keeping the harbor in safe hands well into the next century.

TEXTRON Marine Systems

Textron Marine Systems/Division of Textron Inc.

Textron Marine Systems, 6600 Plaza Drive, New Orleans, LA 70127-2584. Phone (504) 245-6600. FAX (504) 245-6634. Telex 6711199TMSNOLA

Circle 280 on Reader Service Card

Seacor, NRC Announce Plans For Oil Spill Recovery Vessel

Seacor Marine Inc. announced plans for delivery of the M/V Tasmanian Island, which will be renamed the SEACOR Osprey and chartered to Marathon Oil Company for term employment.

SEACOR Osprey will meet standards for ABS classifications as an Oil Spill Recovery Vessel (OSRV) and will satisfy USCG safety regulations for the skimming and handling of recovered oil. Enhanced firefighting capability is also being added to the vessel. The Osprey, which will continue to be engaged in regular commercial service in the Gulf of Mexico, will be available to the National Response Corporation (NRC) for spill response operations and drills, and for inclusion in NRC client response plans required by the Oil Pollution Act of 1990 (OPA 90).

The SEACOR Osprey will be used to transport supplies and materials to Marathon's offshore production facilities from Marathon's base in Venice, La.

NRC will have unrestricted access to the Osprey for any emergency.

The Osprey had work done at Quality Shipyard, Houma, La.

For additional information on Seacor Marine, Inc.

Circle 43 on Reader Service Card

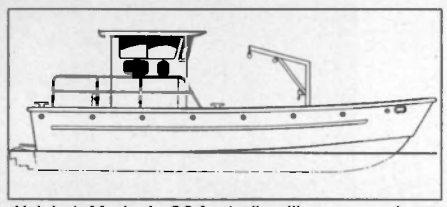
For information on NRC,

Circle 44 on Reader Service Card

Kvichak Wins Contract To Build Kodiak-Powered Oil Response Vessel

Kvichak Marine Industries of Seattle was awarded a contract to build a 32-foot oil spill response vessel for Riedel Environmental Services, Inc., which is based in Portland, Ore.

The new boat is slated to be stationed at Cathlamet, Wash., joining Riedel's fleet of four vessels to protect the lower Columbia River under contract to Clean Rivers Cooperative of Portland.



Kvichak Marine's 32-foot oil spill response boat

The fast-response vessel from Kvichak features a bow ramp to enable rapid deployment of spill containment boom, shallow draft that is ideal for inland waterways service, and a fully-enclosed pilot house for all-weather operations.

The all-aluminum boat will measure 32.5-feet long, with a beam of 11.5 feet, and a draft of just 18 inches. Propulsion will be provided by a Kodiak 502 gasoline engine rated at 380 hp, coupled to a Kodiak 303 waterjet pump drive.

For additional information on the services and capabilities of Kvichak Marine,

Circle 63 on Reader Service Card

CLARIFICATION

The ABB Turbocharger Co., erroneously identified in an October 1992 story on the SNAME show in New York, is a North Brunswick, N.J.-based company equipped for metallizing, balancing and repairing all turbochargers and rotors manufactured by ABB, as well as the reconditioning of blades, bearings and pumps, performed in the company's unique "clean room." The company also maintains a warehouse stocked with thousands of spare parts for the various turbocharger models. Parts can be shipped at a moments notice, with the help of a sophisticated computer system which maintains inventory, prices and other relevant data.

For further information on ABB Turbocharger products and services, or for a listing of the company's service stations across the U.S. and the world,

Circle 97 on Reader Service Card

High-performance Amercoat 385 is the most versatile marine epoxy you can use—inside or outside

Ameron's Amercoat 385 multi-purpose epoxy coating provides high-performance protection both topside and down in the cargo tanks

Whether you need to line a tank or protect a few acres of deck, Amercoat® 385 multi-purpose epoxy coating is the high-performance, cost-effective solution for marine applications.

VOC-compliant Amercoat 385 forms a tough, abrasion-resistant film that is an excellent barrier to corrosion. It adheres strongly to bare steel, coated steel, stainless steel, aluminum, galvanizing, inorganic-zinc silicate coatings and concrete, as well as other substrates. And because Amercoat 385 also adheres to intact old paint and tight rust, it can significantly cut your preparation time and expense.

Highly resistant to most chemicals, Amercoat 385 is ideal for many aggressive environments. As a tanklining, Amercoat 385 is suitable for petroleum fuels, sewage waste, alkaline and salt solutions and a variety of chemical cargoes. It can be immersed in both salt water and fresh water at temperatures up to 140° F.

Amercoat 385 is also available in an inhibitive pigment formula, 385P, that offers enhanced protection without added lead.

User-friendly Amercoat 385 can be applied by various spray methods to produce a smooth, fast-drying film. You can overcoat it with a wide range of topcoats, including polyurethanes and acrylics.

For more information about versatile Amercoat 385, contact the Ameron Marine Coatings Division, 245 S. Los Robles Ave., Pasadena, CA. 91101 (818) 683-4000; Fax (818) 682-4060.

Ameron®

Circle 201 on Reader Service Card

Falcon Maritime Ventures Licenses Innovative Aluminum Boat Building Process To Yamaha Motor Company

Falcon Maritime Ventures, of Fort Lauderdale, Fla., has entered into a licensing agreement for the technology of its advanced aluminum boat construction process with Yamaha Motor Company, Ltd., of Japan, according to Falcon's senior representative, **Anthony Barrois**. Yamaha's Marine Group produces more than 16,000 boats annually, representing two-thirds of the Japanese pleasure boat market.

A radical departure from previous construction techniques, the Falcon process is a technologically innovative method of building aluminum boats developed and patented in 1988 by **Dan Johnston**, an inventor and boatbuilder who became Falcon's president. In essence, the process is an application of the monocoque construction process. Overall construction is simplified, requiring less material, manpower and virtually no fairing.

Through the Falcon process, hull panels take on induced curvature in either concave or convex shape. Therefore, builders are able to develop complex shapes with greater ease at less expense.

The need for internal framing is substantially reduced due to the Falcon process's plate-to-plate compressive loading of hull panels. The frames are attached to the hull plate only at keel, chine and gunnel. The longitudinal members are used solely as panel stabilizers and are not attached to the hull plate.

In the process, all distortion created by the welding is controlled, while the significant reduction in welding drastically reduces the stress points. Because the process minimizes welding, the anti-corrosive properties normally lost in conventional construction methods are preserved. Also, as the shell plate is self-supporting, there is virtually no need for internal framing and the buckling normally created by welding aluminum is eliminated. This significantly reduces the fairing process that normally doubles the man hours required to finish a boat. Where a boat in the 100-foot class might normally require several tons of fairing compound, a boat constructed with the Falcon process would require less than 500 pounds of fairing compound.

A compound of silicon-based elastomer is injected between the skin and the framework. This allows the plate to yield and work against predetermined load points. Therefore, the hull is immune to the negative effects normally caused by thermal expansion.

The Falcon process reduces overall weight by as much as 75 percent over the total structure weight of the boat. Consequently, less fuel and smaller engines are required, creating greater accommodations space.

Hull interior of the Global I, built using Falcon Maritime Ventures' patented aluminum construction process.

Several prototypes have passed rigorous tests, including an evaluation by the U.S. Navy. The Navy's craft was a 30-foot, rigid-bottom inflatable boat constructed with the Falcon process and outfitted with Falcon's patented shock-absorbing seating system. The vessel was rated as an "extremely sturdy, well-built craft" and received the highest possible Naval Sea Systems Command test score available. Major international boat manufacturers are currently working with Falcon on various ventures and licensing agreements.

The Falcon aluminum boatbuilding process significantly lowers total construction time, materials and cost, while increasing the finished vessel's performance potential by creating a smaller engine plant, less machinery and reduced manpower.

Through the process, boat manufacturers create a stronger, lighter and more flexible hull which requires little fairing, and is easier and less expensive to construct and repair. Falcon is offering boat manufacturers plagued by high material and labor costs an opportunity to reduce their overall construction costs and delivery times, while increasing profitability.

In addition to its Fort Lauderdale headquarters, Falcon Maritime Ventures also maintains offices in Colorado Springs, Colo., and Seattle, Wash.

To receive additional free information from Falcon Maritime Ventures about its new aluminum boatbuilding process,

Circle 42 on Reader Service Card

Astano Receives Bardex Turret Turning-Locking Systems Controls

Bardex Corporation, of Goleta, Calif., has shipped to Astilleros y Talleres del Noroeste, SA (Astano) the intrinsically safe control system for the turret turning and locking system to be used onboard the Tentech 850C floating production vessel being built at Astano's El Ferrol shipyard in northwest Spain for Ocean Production and Smedvig.

The control system, suitable for use in a Zone One hazardous area, consists of the following components: a local enclosed, fully integrated electric control panel equipped with the actuators and display necessary for either automatic or manual operation of the system; a control cubicle complete with programmable controller, logic relays and proportional control valve electronics; and pressure compensating proportional valve units.

Bardex also is supplying four hydraulic gripper-jack assemblies for rotating the floating production vessel's turret in either direction and locking it in position. The Bardex advanced turret system will reportedly be capable of rotating the turret at speeds of as much as 360 degrees in 25 minutes.

For additional free information about Bardex's turret turning/locking control system,

Circle 11 on Reader Service Card

USSC Set To Jump-Start U.S. Shipbuilding Industry

Shipowner Skaarup, Former Maritime Commissioner Quortel Envision Simplified, Component-Assembly, High-Tech New Yard

By Greg Trauthwein

By 1995 U.S. shipbuilding and equipment supply lines will be reinvigorated if the well-laid plans of shipowner **Ole Skaarup** come to fruition.

Mr. **Skaarup's** current strategy is to take over an existing yard, or build one if suitable facilities and willing partners can't be found, and launch a new highly-simplified, high-tech builder, U.S. Shipbuilding Consortium (USSC).

"We want to revive the shipping business, and reestablish shipbuilding in the U.S.," Mr. **Skaarup** said.

To help, Mr. **Skaarup** has enlisted the services of **Robert Quartel**, a former Federal Maritime commissioner, as USSC's president. Both men have lobbied long and hard for the reformation of U.S. maritime policies to make this country's industry competitive on an international basis, and both believe the USSC concept can provide money and jobs to an industry in need. Mr. **Skaarup** and Mr. **Quartel** both believe conditions are right for the U.S. to return to the international shipbuilding forefront.

High-Tech, Simple Design

"We have high-tech manufacturing techniques and engineers, favorable labor rates and an educated workforce, and competitive raw material prices," Mr. **Quartel** said. "What we don't have is a competitive supply network or an efficient workforce; one of our goals is to have a supplier stream near the U.S."

The crux of the USSC plan: a simplified ship built in a simplified manner.

The USSC solution hinges on a simplified design of a 40,000-ton double hull tanker, designed by one of Mr. **Skaarup's** top designers, which can take advantage of the market demand created by the Oil Pollution Act of 1990 (OPA 90).

USSC's goals are simple: build tankers (initially, with other ship types, such as bulk carriers, added later) which can compete on the international market; gaining the support of shipyard and equipment supplier partners; create a modern manufacturing, "component assembly" shipyard, relying on yards and other manufacturers which are competitive in their respective area of component building; and launch the first tanker by 1995.

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Response to date has been most encouraging, according to Mr. **Quartel**, but at press time no deals have been sealed so potential partners could not be revealed.

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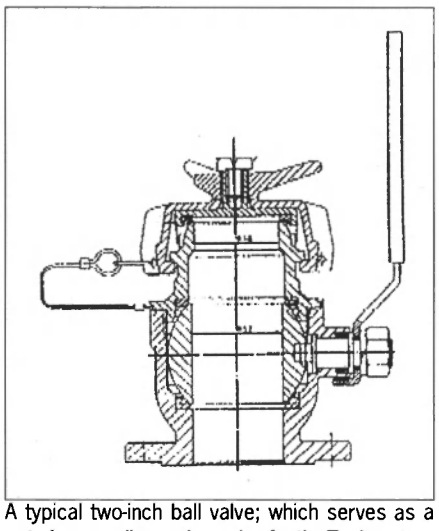
The use of a vapor control system changes cargo transfer considerably. With vapor lines connected between cargo tank and shore, safety became more important. The U.S. Coast Guard has issued new rules specifying the design and operation of vapor control systems. On top of this, there is an ever-growing concern and new rules in the U.S. from the Occupational Safety and Health Administration (OSHA) and individual companies over the occupational exposure of employees.



A typical two-inch ball valve; which serves as a gate for sampling and gauging for the Tanksystem sampler.

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Circle 88 on Reader Service Card

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This method can help reduce the overall time and costs of spill cleanup because: there is no secondary spill during retrieval; the product does not absorb water and will remain buoyant; and the product is landfill approved, or incinerates with less than one percent residual ash, the manufacturer reports.

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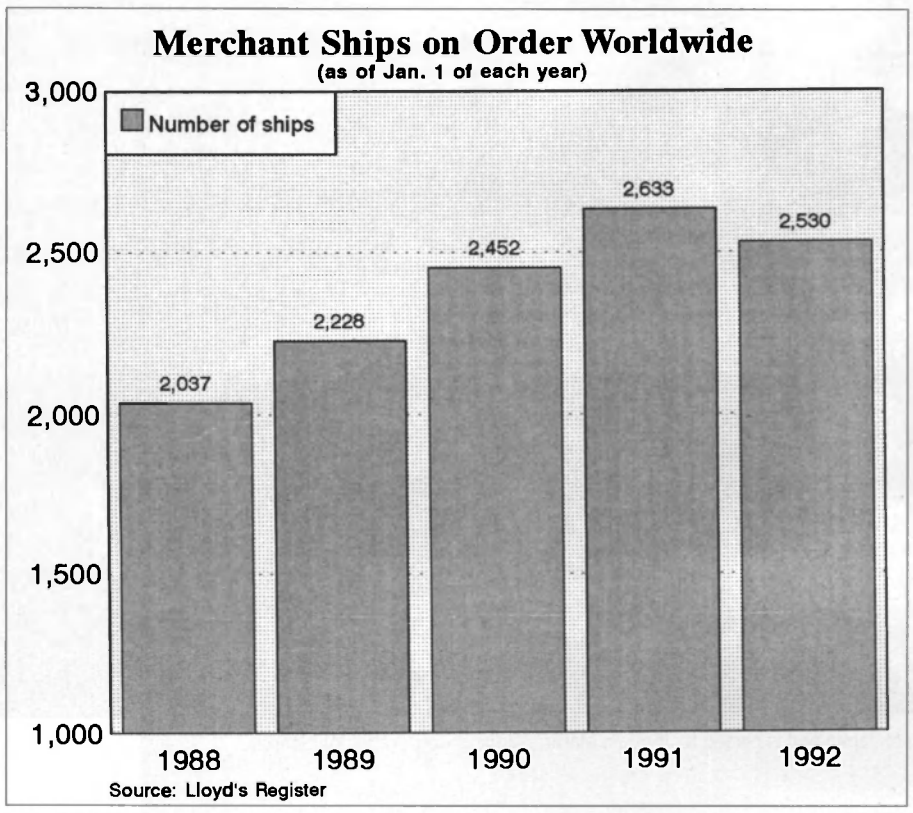

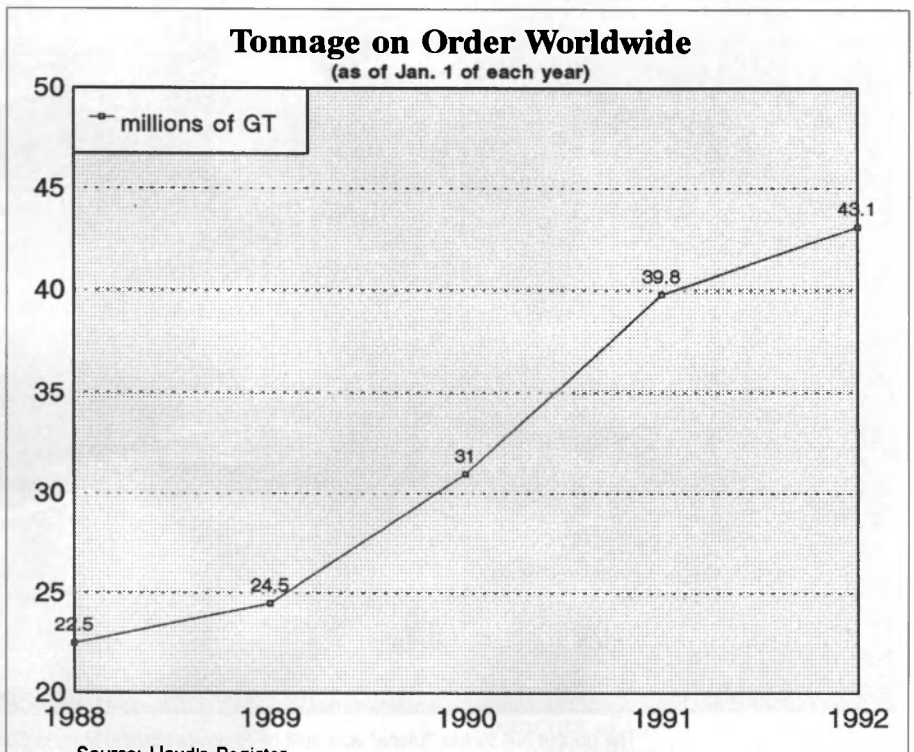

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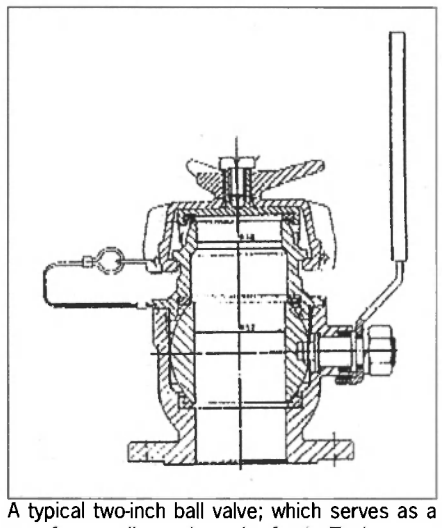

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Du Pont Offers Information On Its Detacouple Joints

Detacouple structural transition joints for welding aluminum to steel are composite inserts that make it possible to permanently join dissimilar metals by standard welding techniques. The joints primary uses in the shipbuilding industry include welding aluminum superstructures and bulkheads to steel hulls, framing and decks, and offer the strength of steel and the corrosion resistance of aluminum.

Structural transition joints for shipboard use are composed of 5000 series aluminum, bonded to low carbon-manganese steel, with an intermediate layer of 1100 series aluminum to assure maximum bond strength. The transition joints are offered in two thicknesses, 0.75- and 1.375-inch, and in either strip or plate form. Strips are also available in widths from 0.75 to six inches, and random lengths up to 144 inches.

Some of the advantages of the Detacouple, according to the manufacturer, include: ease of installation; resistance to corrosion; reduction in vessel weight; increased vessel speed; and a lower center of gravity. For a free brochure on the Detacouple transition joint, including facts and figures on the products mechanical properties and corrosion resistance,

Circle 57 on Reader Service Card

Sioux Offers Explosion-Proof Cleaners

Sioux Steam Cleaner Corporation manufactures a complete line of all-electric, explosion-proof cleaners for the petroleum industry, units in 72 sizes, on stationary, skid or portable mountings, with an optional five-coat vinyl finish to protect against corrosion.

The products, intended specifically for use in oil field operations, also lends itself for use for offshore drilling, rig maintenance and other areas where conventional cleaners may not be practical.

Designed for use in a hazardous environment, the company's cleaning units provide steam cleaning in addition to hot and cold water pressure washing. Ratings are available for 40 to 240 gph, 325-degree Fahrenheit saturated steam and 80 to 720 gph pressure washing, with up to 3,000 PSIG.

Sioux cleaners have no flames, fumes, odors or smoky exhaust, and are said by the manufacturer to provide years of environmentally safe operation.

For information on Sioux,

Circle 61 on Reader Service Card

CAST Helps Supply Raytheon-Led ADSS Effort For USCG In Alaska

CAST, Inc. (Computing Applications Software Technology, Inc.) will supply the GPS satellite navigation elements of the program known as the Automated Dependent Surveillance System (ADSS) recently awarded to the Raytheon Co. of Lexington, Mass., by the U.S. Coast Guard.

Raytheon's Equipment Division is the prime contractor for the ADSS, which will provide Coast Guard watchstanders in Valdez, Alaska with marine traffic information from the Prince William Sound area. Among the features of the ADSS are the use of CAST-supplied GPS navigation and ancillary communication elements for both ship and shore use. The GPS shipboard element will be enhanced by differential corrections as determined and communicated by a land-based GPS reference system to provide automatic vessel position reports accurate to 10 meters.

CAST was started more than 10 years ago principally to develop fixed-price, military software programs in the navigation and communications field. CAST has produced specialized GPS software and systems for the development, test and navigation of GPS systems. The company was recently acquired by Pacer Systems, Inc. of Billerica, Mass., as a wholly-owned subsidiary.

For more information on the products and service offered by CAST, Inc.,

Circle 52 on Reader Service Card

The double hull tanker "Diana" was built by Sanoyas Hishino Meisho Corp. of Japan and is owned by the San Martin Shipping Corporation of Liberia.

WORLD SHIPBUILDING REPORT

Orders For Replacement Tonnage Remain Steady; Demand For New Ships Expected To Increase At End Of Decade

By John R. Snyder

With tanker tonnage accounting for almost 50 percent of the total, the world shipbuilding order book, as of June 1992, reached 41.4 million gt, eclipsing last year's mark of 39.6 million gt set during the same period. Of the 2,410 ships in the world order book, there are 1,349 steam and motor ships with a gross tonnage of 17,726,092 under construction, a jump of more than 700,000 gt over the previous quarter. There were 1,061 ships on order, not yet commenced, with a total gt of 23,682,502.

Although ship deliveries were down from last year at this time (834 to 770), tonnage production is up 18 percent, from 8,113,935 gt to 9,603,085 gt, reflecting the large amount of VLCC tonnage on order.

Japanese builders retained their grip on the top spot, with an order book of 470 ships totaling 14.69 million gt—a 35.48 percent market share. Far East rival South Korea, recovering from labor difficulties, rebounded with a 19.53 percent market share, with 142 ships of 8.09 million gt on order or under construction. Surprising Denmark slipped past the People's Republic of China, Romania, Taiwan and Germany into third place. The Danish order book consists of 59 ships under construction and on order of 2.11 million gt for a 5.09 percent market share.

In the U.S., most of the shipbuilding activity in 1992 centered around ongoing Navy ship construction programs.

On the commercial side, U.S. shipyards delivered four oceangoing merchant vessels—two 401-foot molten sulfur tankers, one 714-foot boxship and one 308-foot icebreaking research vessel. Currently, there is one 524-foot molten sulfur tanker on order.

Leading Shipbuilding Nations

(gross tonnage in thousands)

Builder	Under Construction	On Order	Total GT
Japan	6088.42	8604.28	14692.70
S. Korea	2759.76	5327.62	8087.37
Denmark	205.08	1901.55	2106.63
China	634.28	1346.37	1980.64
Romania	1081.88	485.51	1567.39
Germany	878.43	606.74	1485.18
Taiwan	403.90	1034.80	1438.70
Croatia	616.89	566.73	1183.63
Italy	862.43	290.99	1153.42
Brazil	722.33	401.15	1123.48

Source: Lloyd's Register

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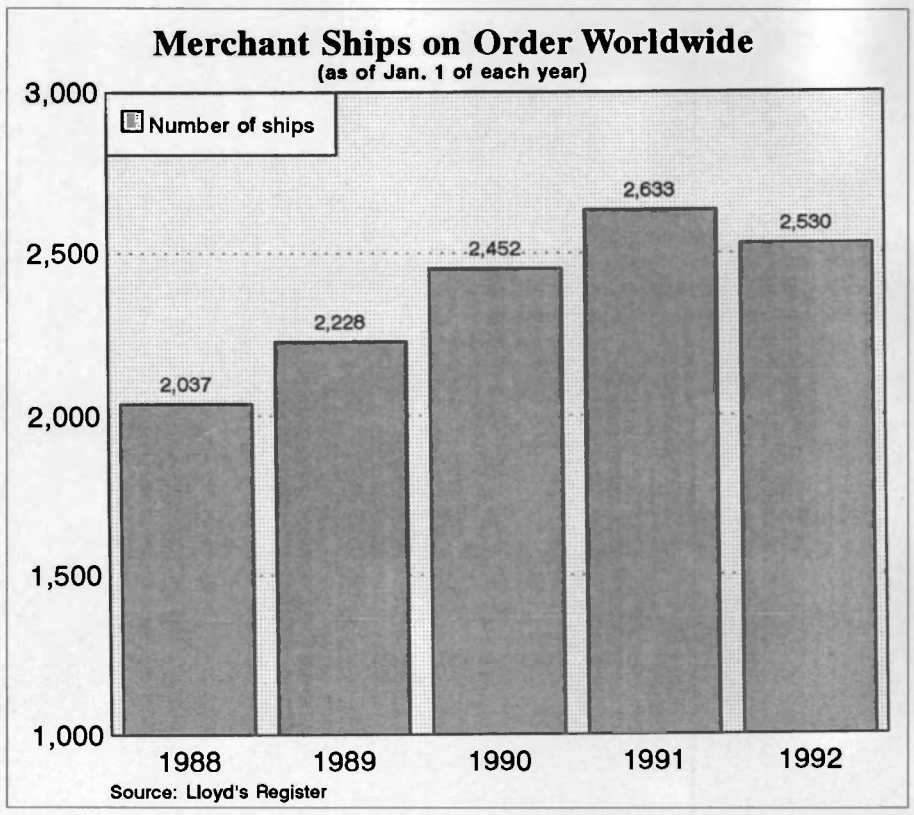
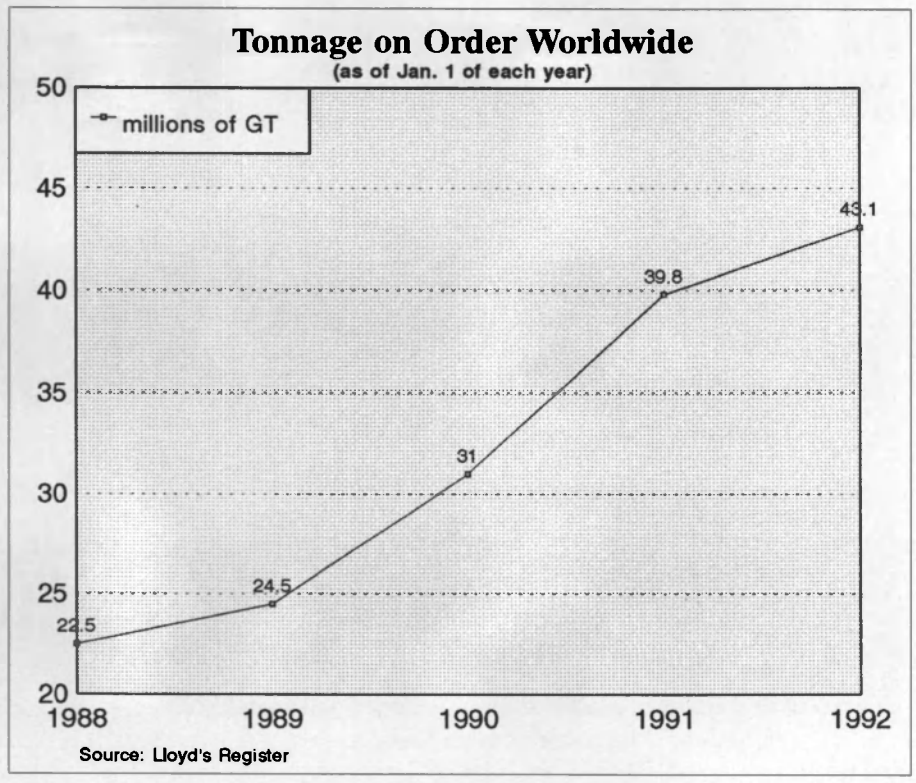




freight rates, and a continued weak economy, they are still running at double the average levels of just 10 years ago.

As of June 1992, the average price of a single-hull 280,000-dwt VLCC was about $85.3 million, while a double-hull tanker of the same size was $101.5 million, according to Clarkson Data Research.

Average prices for other size vessels ranged from $263.3 million for a 125,000 cubic meter capacity LNG carrier and $82 million for a 78,000 cubic meter capacity LPG carrier, to $66.7 million for a 3,500-TEU dry cargo ship and $49.3 million for a 155,000-dwt bulker.

Market Outlook

A steady demand for new ships is expected during the second half of the 1990s and into the next decade based on the need for replacement of older tonnage, the condition of the current world merchant fleet and an increase in world seaborne trade.

Because of the building slump in the early- and mid-80s and a decrease in the scrapping level in recent years, a large chunk of the 640 million-dwt world merchant fleet will reach the end of their useful service lives by the close of this decade. The average age of the world fleet is 14 years.

Furthermore, with the trend of more and more vessels staying in service longer, there has been a steady increase in maintenance work for repair yards.

Life extension is most pronounced for oil tankers, with service lives estimated at 23 years for VLCCs and 25 years for smaller ships.

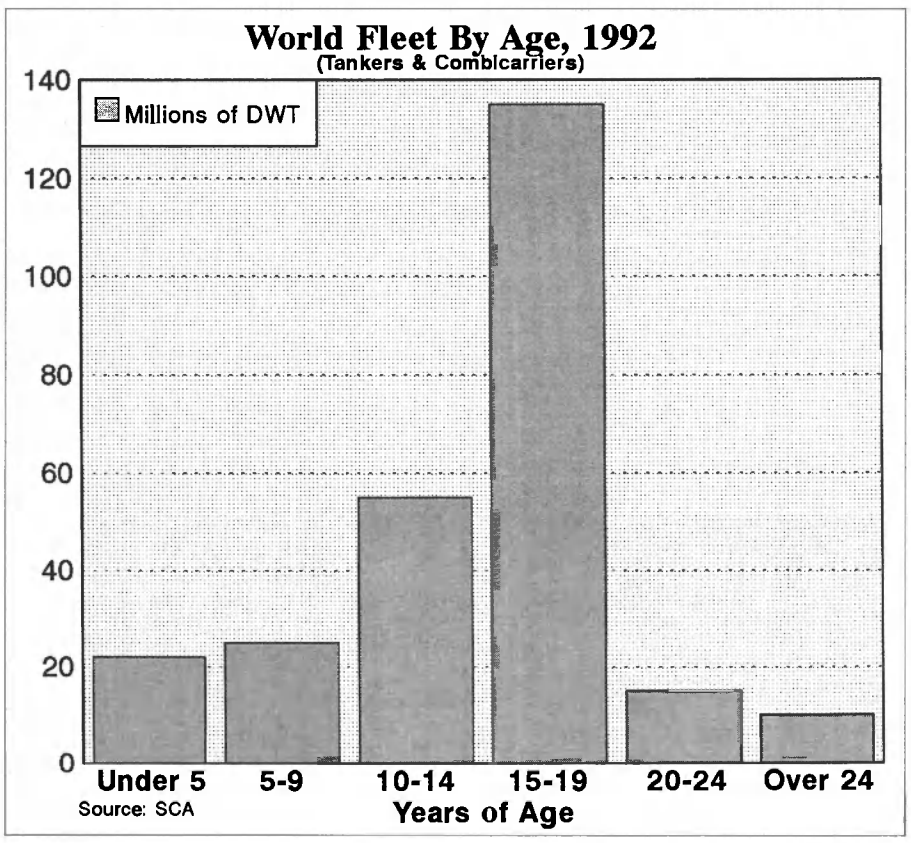
A study by AWES, the association which represents builders in Western Europe, forecasts that the average annual requirement for new ships, including non-cargo-carrying vessels, will be about 11.8 million compensated gross tons (cgt) until 1995. Demand will then rise between 1995-2000 to 15.4 million cgt annually and even further between 2000-2005 to 18.7 million cgt annually.

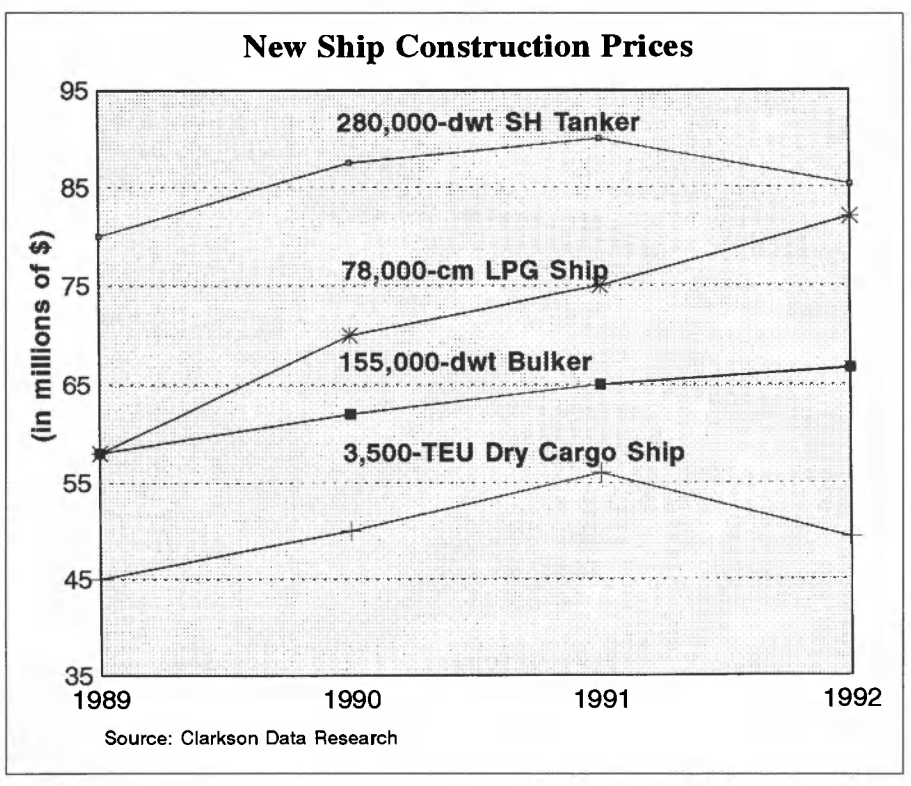
AWES points out that, overall, the majority of the newbuilding activity, about 421 million dwt, will be for replacement tonnage.

In the near term in the U.S., domestic yards are optimistic concerning the award of new construction and conversion contracts for the Navy's Sealift program in 1993 (see related story, page 25). The main competitors are expected to be drawn from the nine shipyards that received $250,000 design contracts in 1992. As many as 12 Roll-On/Roll-Off ships will be built and eight converted for the $4 billion to $5 billion program.

Furthermore, with the average age of the U.S.-flag tanker fleet exceeding 17 years, many of these ships will have to be retired or retrofitted between 1995-2015 as mandated by OPA.

In particular, about 40 ships of the coastal tanker fleet will face retirement in the last half of this decade. Perhaps as many as a half dozen ships may be ordered over the next three years.





Trinity's Aluminum Boats Delivers 25th Vessel To Saudi Arabia's Barberlines

Aluminum Boats, Inc., of Crown Point, La., a member of the Trinity Marine Group (TMG), recently delivered the crewboat Abeer Three to Barberlines Arabian Navigation and Shipping Company, Ltd., of Saudi Arabia. It is the 25th vessel designed and built by Aluminum Boats for the Saudi Arabian company and replaces another Aluminum Boats-built vessel of the same name which was sold by its owners.

The Abeer Three is 86 feet long, with a 20-foot beam and a 9.3-foot depth. The vessel's normal operating draft is 5.5 feet and she can carry up to 51 passengers and a crew of five.

Power is provided by two Detroit Diesel 16V92TA engines, developing 1,100 shp each at 2,300 rpm, driving Rolla Nibral five-bladed propellers through ZF reverse/reduction gears. Two Detroit Diesel 3-71 engines power two 40-kW Kato generators to provide the crewboat with electricity.

A partial listing of navigation and communications equipment includes: two Furuno radars; a Raytheon, Ray GPS navigator; two Datamarine fathometers; a Robertson gyrocompass; a Ritchie magnetic compass; two Sailor VHF radios; and an Icom SSB radio.

TMG, of Gulfport, Miss., is owned by Trinity Industries, Inc., Dallas, Texas.

For additional free information about the services available from the Trinity Marine Group,

Circle 10 on Reader Service Card

Autronica Develops Mooring Protection System

A system that monitors ships at quayside has been developed by Autronica, of Trondheim, Norway. The Autronica Mooring Protection System GX-95 displays the changing load on each mooring hook as a bar chart, and could be particularly useful for large tankers and ore carriers during cargo loading and discharge operations.

The new system is designed to assist harbor supervisors by keeping them continuously informed of the load on each mooring point. Loads measured by a strain gauge in the center of each mooring hook are displayed numerically in tons and graphically as a bar chart on a monitor. The condition of the mooring lines can be quickly observed, a rising bar turns from blue to red and releases an alarm at a preset tonnage load limit, while a yellow bar indicates a signal malfunction. All data is saved so that each mooring history can be retrieved later. The surveillance monitor's image is designed to provide a true picture of the jetty layout with the correct number of hooks.

Autronica's mooring system can also be used in conjunction with the company's Berthing Aid System GX-90.

For additional free information about Autronica's new Mooring Protection System GX-95,

Circle 15 on Reader Service Card

Department Of Interior Moves To Encourage U.S. Offshore Development

To provide a boost to U.S. domestic offshore oil and gas development, the Department of the Interior has announced that it will make several regulatory changes, including cuts in some required royalty payments to the government.

It is reported that the Department is seeking to provide oil companies with incentives to explore and develop offshore reserves that are now considered uneconomical or too risky.

The area that the Department of Interior particularly has in mind for development is 208-million acres, mostly in the western and central Gulf of Mexico, where oil and gas drilling is still allowed. The regulatory changes will not affect large tracts off the U.S. coastline where drilling has been put on temporary hold by congressional prohibitions.

Survey Shows Shallow-Draft Construction Is Up

Power Driven Vessels, River Barge Construction Jumps In '91

An annual report which tracks the trends in shipyards which serve the shallow-draft, coastal and harbor sectors of the U.S., revealed good news for the industry from 1991, not a claim many industries can stake. Employment levels are at a ten-year high, and there were significant increases in the number of power driven and military vessels built, and an appreciable increase in the number of river barges and tank barges constructed, versus 1990 levels.

The report, dubbed the "1991 Annual Shipyard Survey," is published by the American Waterways Shipyard Conference (AWSC) and is based on its members' responses. Member yards of the organization, which is a conference of the American Waterways Operators (AWO), stretch along the East, West and Gulf Coasts, as well as the banks of inland waterways of the U.S.

New Construction Up

While the number of power driven vessels newly constructed is a far cry from the peak year, 665 built in 1982, it is encouraging to note that the number of new power driven vessels built rose to 122 in 1991, a 36 percent increase over 1990, and marks the first year an increase has been measured since 1987 (see table 1). The power driven vessel category includes everything from towboats, tugboats, supply boats and crewboats to fishing vessels, passenger boats and military boats. Driving the surge were large increases in the number of military vessels and offshore supply boats/crewboats. Military vessels construction alone increased 93 percent in 1991. Both fishing vessel and ferry/passenger vessel newbuildings were down in 1991.

Similar to power driven vessel increases, there was a 16 percent increase in the total number of river barges constructed in 1991. Looking at the past 10 years, new construction of river barges peaked in 1982 with 808 new buildings, but bottomed out in 1987 when only 145 were constructed. Since then, however, new constructions have set a torrid pace, culminating in 604 new river barges in 1991. Among river barges, hoppers accounted for the largest increase, as 441 were newly built in 1991 versus 380 in 1990. Also, the number of machinery barge newbuildings tripled, from 12 to 36, and river tank barge construction increased by 27 percent over the previous year's levels.

Despite the encouraging numbers, newbuilding increases were not across the board. For example, while the construction of new river tank barges increased 27 percent, the construction of new river deck barges fell 45 percent. Also, there was a 67 percent decrease in overall construction of new offshore barges between 1990 and 1991, with the construction of new offshore dry cargo hopper and deck barges decreasing by 88 percent. A total of four offshore barges were recorded built in 1991.

Employment Levels Best In 10 Years

In conjunction with new construction increases, and an encouraging sign that yards are receiving work, the number of people employed by these second-tier yards rose by more than 6,000 over 1990 levels, and have reached the highest level in the previous 10 years. Figures from 1982 show (see table 2) that 26,930 were employed in second tier yards, and there was a gradual decrease until 1989, when employment hit 13,489. Two dramatic jumps have been measured since than, including more than 7,000 employees added in 1990, and a similarly large increase in 1991 to reach the 26,972 level now employed in this industry sector.

Harrah's Casino boat under construction at Service Marine, Morgan City, La.

Number Of Repairs Increase

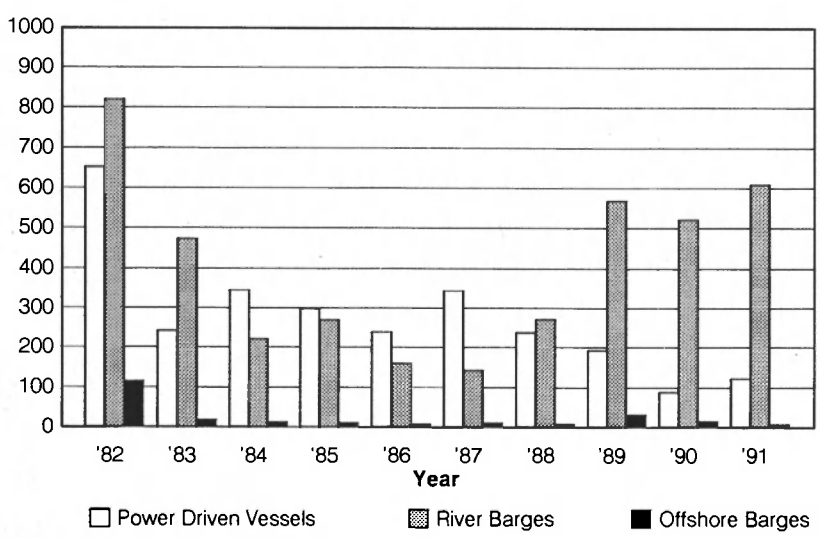
Overall, there was a 31 percent increase in the number of power driven vessels repaired, and a 48 percent increase in repairs for river barges, while there was a 46 percent decrease in the repair of offshore barges in 1991 (see table 3).

In total, there were 7,712 reported repairs of power driven vessels in 1991, with the repair of fishing vessels increasing 54 percent of the previous year and accounting for 1,492 of the reported repair jobs. Other vessels which logged high repair jobs include towboats, with 2,818, and tugboats, with 1,001, both increases over 1990 levels.

Driving the 48 percent increase of repairs to river barges was the repairs for river tank barges, which increased 100 percent in 1991. There were a total of 23,386 repair jobs reported, a solid 50 percent higher than any of the previous 10 years, with tank barges accounting for 8,215 repair jobs, and hoppers accounting for 12,836 jobs.

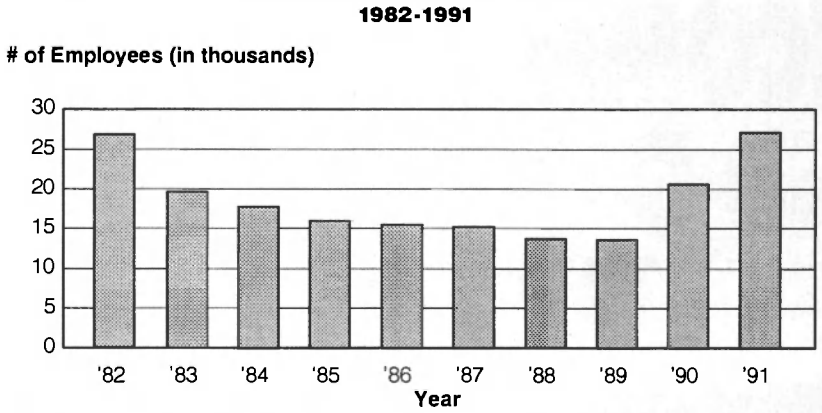
Mirroring new construction num-

TABLE 1
New Construction Activity
1982-1991



Source: AWSC Annual Construction Survey.

TABLE 2
Employment Levels
1982-1991



Source: AWSC Annual Construction Survey.

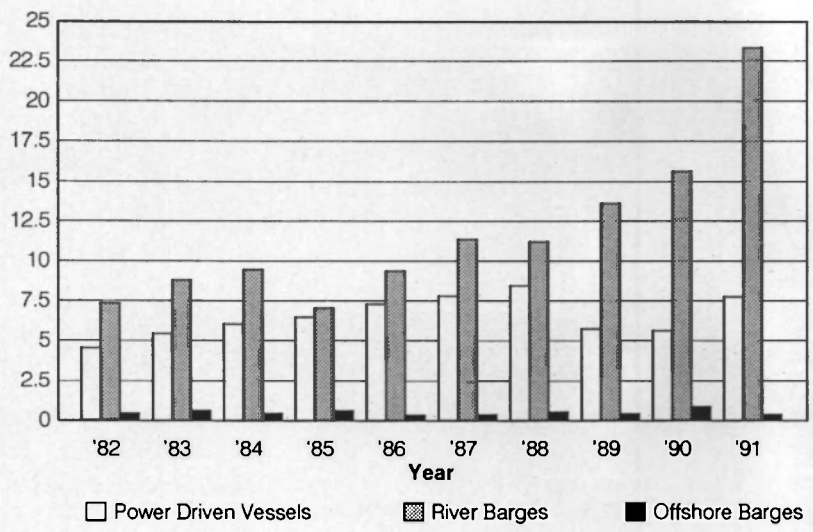
bers are repair activity reports on offshore barges. There was a 46 percent decrease in the repair of offshore barges between 1990 and 1991, with the repair of offshore dry cargo hoppers and deck barges decreasing 52 percent and repair of offshore tank barges decreasing 14 percent. In total, there were 407 reported repair jobs on offshore barges, compared to 752 in 1990.

Methodology: The survey conducted by the American Waterways Shipyard Conference (AWCS) contains data gathered from approximately 80 percent of the construction and repair facility members of the AWSC. For further information or a complete survey, contact: American Waterways Operators, 1600 Wilson Blvd., Ste. 1000, Arlington, Va. 22209; or call (703) 841-9300.

TABLE 3

Repair Activity

1982-1991



Source: AWSC Annual Construction Survey.

Blount Delivers Mayan Prince To American Canadian Caribbean Line

Blount Industries of Warren, R.I., completed the Mayan Prince, a 175-foot long, 99-passenger cruise ship for the American Canadian Carribean Line, Inc.

The vessel, which has a draft of 6.5 feet, features 47 cabins and will operate in the summertime to Canada via New York, Hudson River, Erie Canal, Lake Ontario and the St. Lawrence Seaway, with major stops in Montreal, Quebec City, Tadoussac and Baie Eternite on the Saguenay River. The Mayan Prince will also call on several smaller ports.

It is the eighth small cruise ship designed and built at the Blount Shipyard, and the vessel took 100 workers 10 months to construct.

The vessel is USCG certified on near coastal routes. It carries a Solas certificate and ABS International loadline. The boat features: Cummins KTA-19m engines; Cummins generators; Michigan 44-inch diameter propellers; Furuno radar; ICOM VHF and SSB radios; Cummins bow thruster engines; Gorman-Rupp fire pumps; an Omnipure sewage treatment system; and a 28-inch diameter bow thruster from American Bow Thruster.

For more information on Blount Industries,

Circle 91 on Reader Service Card

New England Trawler To Be Represented by Rheams

New England Trawler Equipment Company of Chelsea, Mass., has announced that effective immediately, the 66-year-old deck machinery company will be represented in the Gulf Coast region by **Steve Rheams** of Rheams Marine Equipment Co.

Rheams Marine, formerly known as Nationwide Sales, is located in Boutte, La.

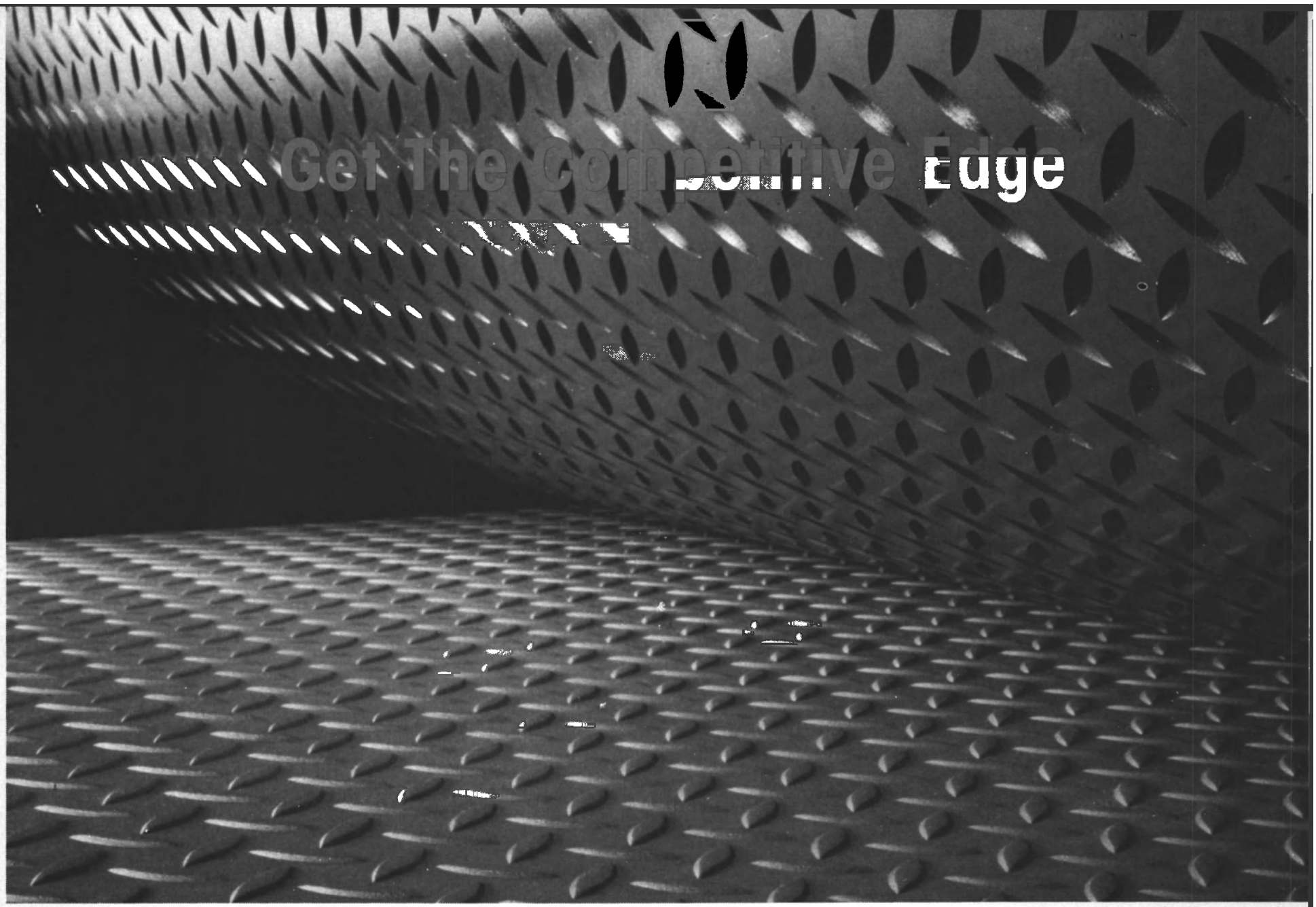
Mr. **Rheams** has more than 10 years of experience in fleet management with various towing/transportation companies operating on the Mississippi River.

More recently he has sold deck machinery and related equipment in the Gulf Coast area. In addition to the NETEC account, Mr. **Rheams** also represents Weather-barrier Coatings and Marine Propulsion, Inc.

Mr. **Rheams** joins the growing team of independent New England Trawler sales reps across the nation. The sales activities of the group of independents is coordinated by **John F. McDonald**, recently appointed National Sales Manager at New England Trawler.

For more information on New England Trawler,

Circle 92 on Reader Service Card



with Stainless Diamond Floor Plate & Sheet from Eastern Stainless

Stainless diamond-patterned floor plate and sheet from Eastern Stainless gives you the competitive edge in corrosion protection, safety, installation and costs:

First, because it's stainless, Eastern's floor plate and sheet protects against corrosion from even the most powerful chemical spills and won't chip, peel, warp, splinter or crack.

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Third, it's easy to install. Eastern's unique design forms a continuous pattern that you can work end-to-end, side-to-side or end-to-side. You can form it, weld it and bend it to meet your needs, without waste.

Finally, stainless floor plate and sheet from Eastern Stainless saves you money. Because it's available in virtually any gauge and two different widths, you only pay for the thickness you need, keeping your initial costs down. Because it works any way you cut or weld it, you have less waste during installation. And because it's stainless, floor plate and sheet never requires painting or patching and lasts may times longer than mild steel counterparts, virtually eliminating replacement costs.

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Circle 211 on Reader Service Card

INMARSAT-A

Marine Industry Applications For High-Speed Data Communications

Recently unveiled was a new dimension of the use of Inmarsat-A, the satellite communications system originally developed for distress and safety links for ships at sea.

The new dimension was spotlighted during a live demonstration. When engine problems halted Railship III, a German-Finnish railway ferry sailing the Baltic, it was Inmarsat-A that came to the rescue, enabling the crew to transmit data and live video of the faulty parts to engineers on shore, who guided the ship out of trouble.

The onboard Inmarsat-A terminal, upgraded to send and receive data at the rate of 64 kilobits per second, carried video signals and data about the engine faults as well as conversations between the ship and experts in Hamburg.

Cameras situated in the engine room zoomed in on key areas of the engine to enable the engineers on shore to examine them closely on a monitor. As they scrutinized the engine on the monitor, they could simultaneously speak with the crew and advise them on how to set the fault right.

"Although it was a planned event, the demonstration of the 64 kilobit high speed data service is just another example of how useful satellite communications can be," said Inmarsat's maritime services development and applications manager, **Herbie Rindorp**. "In fact, the system can be extended to any scenario in which shipboard personnel need assistance in realtime from experts on shore."

The demonstration showed how shipboard personnel could call upon shoreside facilities for maintenance and repair tasks, performance monitoring, fault diagnosis, cargo planning, or even medical advice. Being able to tap shore-based experts for instant advice could help save time, effort, money and possibly even lives.

The demonstration was performed at the Norwegian Telecom International stand at SMM '92 in Hamburg, Germany by Marin-ABC, the Marine Industry Applications of Broadband Communications consortium which involves eight countries and seven maritime organizations, including Inmarsat. Marin-ABC is one of 80 Research and Development for Advanced Communications in Europe (RACE) projects sponsored by the European Community.

The goal of the consortium, which was established in 1989, is to promote the use of advanced communications for improving ship operations in the European Community.

In fact, Inmarsat has several versions of high speed (56 and 64 kbps) data capabilities as options for the Inmarsat-A terminals, Ship Earth Stations (SESs) and the Coast Earth Stations (CESs). The first of these, already available, is the High Speed Data (HSD) service at 56 or 64 kbps. Digital data is transmitted at this speed from the SES to the CES, while the return path (CES to SES) is supported by a voice grade (analogue) telephony channel.

A full duplex HSD (DHSD) service at 64 kbps is also available. This service uses a symmetrical duplex channel between the SES and the CES. The HSD and DHSD services have many applications for digitized Hi-Fi audio, compressed video (real time, and for a higher quality, store & forward), video conferencing, high speed facsimile (group 4), data collection (remote monitoring) and high speed data transfer. Also, combinations of the above (multi-media) are possible.

Currently available from several SES manufacturers are 56/64 kbps option kits for mobile and transportable models of Inmarsat-A terminals.

In most cases, the simplicity of the additional digital encoder and modulator needed for the HSD transmitting function have enabled the manufacturers to fit this option within the existing SESs. Several SESs are designed so that either speed (56 or 64 kbps) can be selected by the user, depending on which speed is supported by the CES to which he is connecting.

For most applications the CES must be interconnected, at the same high data rate, to another shore destination, such as the shipowner's head office. While some could find a leased-line solution acceptable, most users will find connection to a public switched data network (PSDN) better. In North America, switched 56 kbps network connections are available and the 64 kbps option is expanding rapidly. Elsewhere, switched 64 kbps networks are more common and pre-ISDNs (Integrated Services Digital Network) are becoming available worldwide.

The North American switched 56 and 64 services can interconnect with ISDN nodes in the rest of the world. The ISDN subscriber equipment in Europe should provide for rate conversion when connected to a switched 56 kbps source. Detailed call-set-up procedures have yet to be defined by Inmarsat, as the switched network interfaces differ among the various CESs.

However, all CES operators are planning to adopt some form of automatic dialing procedure, so that the SES will be able to connect to any terrestrial ISDN destination. Also, several CES operators are expected to implement automatic means for a terrestrial ISDN user to call the SES.

Store and Forward Applications

Data transfer, from ship to shore, is not only applicable to the traditional kinds of data, like seismic measurements, but also for temporarily stored digital data from audio and video codes.

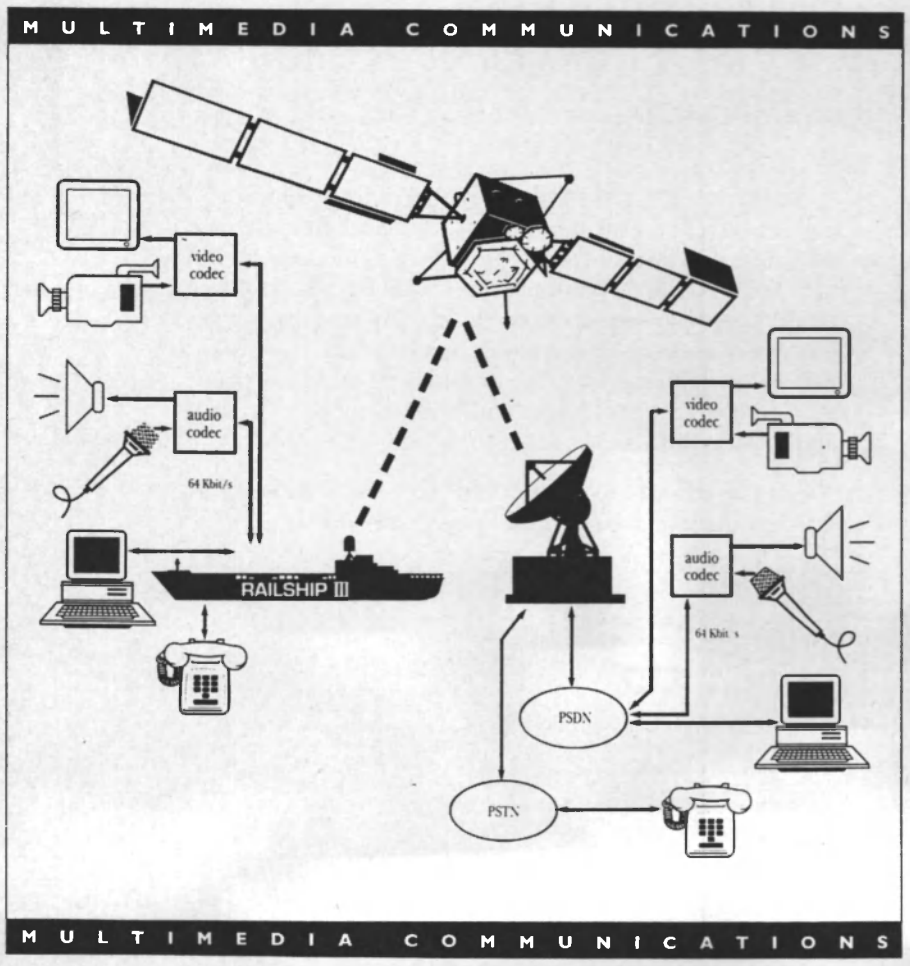
Good quality compressed video is needed to digitize at higher rates (9384 and 768 kbps being typical) than the HSD service. It is possible to store the compressed video material on the hard disk of a computer, then transmit it from the ship to shore at 56 or 64 kbps, receive and buffer it at a central facility and then replay it at the higher original rate.

This store and forward method also ensures that the received material is error free, since error detection and repeat transmission techniques can be applied.

When DHSD services are used it is also possible to transmit higher quality video to the ship. Some potential applications include instruction and training videos for the crew and entertainment videos for passengers.

Real Time Applications

High Quality Audio. The high speed data service has been used to provide a broadcast quality audio



A Marin-ABC demonstration of Inmarsat-A featured real time compressed video, interactive computer sharing, high speed data transmission and high definition still images.

The Edward Ovetter Cable Ship is outfitted with an Inmarsat-A radome.

report from a ship to, for example, a news bureau. In interactive mode, when questions are being asked by a shore-based commentator, the analogue voice grade return channel is utilized.

The lower quality of this channel is not important since the listeners will hear the voice of the commentator in the studio. This has mainly been used on land, by journalists for example. The same facility also makes it possible to transmit Hi-Fi Audio to cruise ships for entertainment.

Compressed Video and Audio HSD video transmissions (from ship to shore) operates identically to the High Quality Audio application, with the camera replacing the microphone and video codes replacing the audio codes. Potential applications include remote materials and equipment inspection, damage assessment and co-operative decision making.

With the DHSD service it is possible to set-up real-time video conferencing.

Also, the audio channel is included in the same bitstream, leaving 48 kbps for the video information when 16 kbps audio compression is applied. Further technological improvements are expected, and the price and the size of video codes are now decreasing.

Of course, the DHSD link can also be used as a 64 kbps data channel to provide high speed data communications, to transfer large quantities of data in both directions, an application of special interest to research and seismic vessels, offshore platforms and passenger ships.

Another application is using the DHSD link as a multiplexed channel, thereby offering a number of digitized voice, facsimile and data channels.

It is attractive for cruise liners to be able to offer several telephony channels via one DHSD circuit.

Following the successful demonstration, the Marin-ABC project ends this year and will be followed up by the Moebius (Mobile Experimental Broadband Interconnection Using Satellites) project as part of the RACE II program.

Moebius will build on the positive results of the Marin-ABC project and develop multi-media platforms for specific applications in the maritime and land-mobile industries.

The advantages of multimedia communications between ship and shore are numerous.

On a basic level, savings in time, effort and money are most apparent. However, broadband communications have the potential for a formidable range of other applications that could affect the future of vessel management and maintenance practices.

Advanced communications offer a vision of a future in which shipboard personnel will call upon shore support for a growing number of other areas where shoreside expertise is needed.

For additional information on the new applications and services of Inmarsat-A,

Circle 16 on Reader Service Card

Marine Propulsion, New England Trawler Reach Marketing Agreement

New England Trawler Equipment Co. (NETEC) of Chelsea, Mass., and Marine Propulsion, Inc., of Hammond, La., have entered into a marketing agreement.

The agreement allows NETEC to represent Marine Propulsion products on the U.S. East Coast, and Marine Propulsion to provide installation and maintenance services for NETEC in the Gulf Coast region.

NETEC sports a product line which includes: capstans; windlasses; winches for mooring, towing, anchoring and oceanographic research; and power units powered by electricity, hydraulics and diesel.

Marine Propulsion is the exclusive U.S. representative of Schottel propulsion equipment and Lohmann & Stolterfoht gears. In addition, the company handles PP Jet water jets, Solo controls and Capital Gears.

For more information on New England Trawler,

Circle 93 on Reader Service Card

For information on Marine Propulsion,

Circle 94 on Reader Service Card

An artists impression of the 149-passenger Hydro-Lance™ ferry

Puerto Rico Places Order For Innovative 'Hydro-Lance™' Ferry

The first of a new class of high-speed marine vessels, called the Hydro-Lance, has been ordered by the city of Arroyo, Puerto Rico. According to **Robert Price**, designer and creator of the Hydro-Lance technology and CEO of Hydro-Lance, Inc., of West Hills, Calif., the new 149-passenger vessel ordered by Arroyo, to be named the 'Arroyo Express,' will perform with less than one degree of pitch or roll in 12-foot seas and at speeds of up to 52 knots. Hydro-Lance's special geometry is reportedly capable of achieving high speeds with less than 50 percent of the power required by conventional craft. A shipyard has yet to be selected for the construction of the Arroyo Hydro-Lance.

Gerald Rennerts, president of American Hydroliners, Inc., of Flushing, N.Y., an affiliate of Hydro-Lance, Inc., and former operator of two hydrofoil passenger vessels, sees the Hydro-Lance as the missing link in waterborne transportation because of its ability to combine speed, comfort, safety and economy in a single design. Mr. **Rennerts** said: "Mayor **Figueroa** (of Arroyo) understands the important relationship between hotel development and high-speed marine transportation. Arroyo is sure to benefit from tourist, fishing industry and time-sensitive cargo transport, which translates into jobs. Previously, the shallow south shore of Puerto Rico was unserviceable. The Hydro-Lance draws only two feet of water, which means a port to most any beach in the Caribbean."

American Hydrolines will operate two Hydro-Lance vessels under the U.S. flag. One will leave Arroyo for Christiansted, St. Croix, then proceed to Charolette Amalie, St. Thomas, and San Juan, Puerto Rico, in succession, while the second Hydro-Lance passenger vessel will simultaneously depart from San Juan for St. Thomas, St. Croix, and Arroyo. In addition to the twice daily routing, trips to the British Virgin Islands and Santo Domingo are now being studied. American Hydrolines is also pursuing the establishment of passenger ferry services in the following areas: Guyana; Jamaica; between New York and Connecticut; New York to Atlantic City; and between Miami and the Bahamas.

Additional design developments by Hydro-Lance include a 52-knot fish freighter designed to transport 200 tons of live crabs from Alaska to Japan, where the cargo commands premier seafood prices, as well as an ocean-going, 52-knot container ship with a 208-container capacity.

To receive additional free information from Hydro-Lance, Inc.,

Circle 65 on Reader Service Card

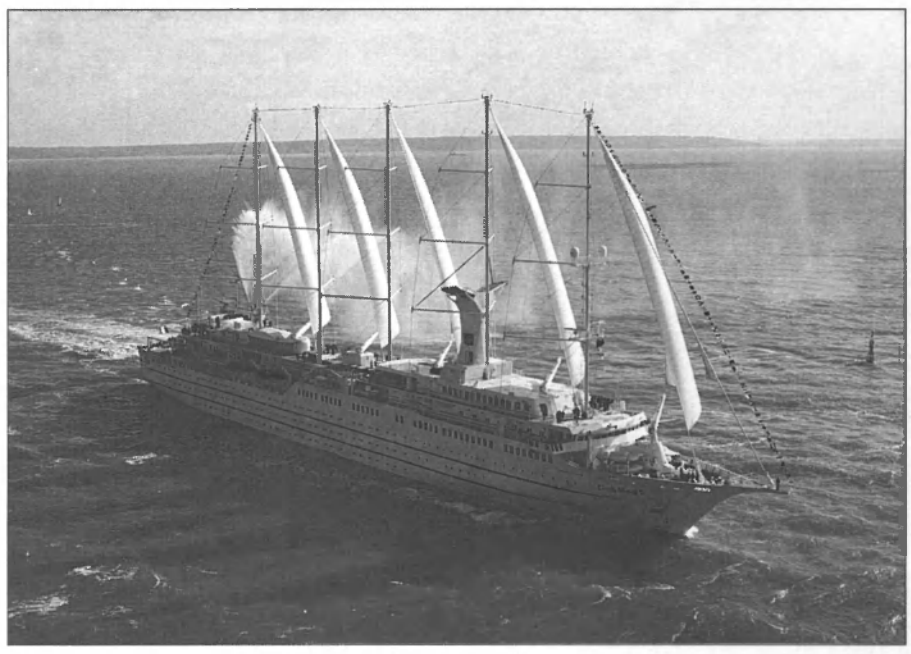
ACH Designs And Delivers The "Largest Sailing Robot," Club Med 2 Sail Cruise Ship

Ateliers & Chantiers du Havre (ACH) recently delivered the Sail Cruise Liner "Club Med 2," to owner Copropriete Maritime. Operated by Club Med and Services Et Transports, the passenger liner's overall design is similar to her predecessor, "Club Med 1," delivered in 1990.

The Club Med 2 is fitted with sails which are totally automated and controlled by computer, and is propelled by an electric-diesel propulsion system. The propulsion system also includes four generator sets, creating 2,280 kW each; two electric propulsion motors, generating 2,940 kW each; two controllable pitch propellers, fully featherable for sail propulsion; one emergency genset; and two transverse thrusters, one fore and one aft.

The top speed under mechanical propulsion is 16.4 knots. In the event of an emergency, all sails can be furled within less than one minute, even without electrical power. Many active and passive, electronic and hydraulic safety devices have been included into what are said to be the largest sailing robots ever to have been built.

Communications equipment on the Club Med 2 consists of two satellite communication systems, telex and telefax, and VHF radio. For fresh water, the ship is equipped with two 145 t/day reverse osmosis plants and one fresh water treatment unit.



The "Club Med 2" recently delivered from ACH

The Club Med 2's sails are entirely computer-controlled

The ship is outfitted with an anti-roll stabilizer, which consists of two folding fins supplied by ACH. It also features two flap-type rudders and two bow thrusters.

With a length of 187 meters, a beam of 20 meters and a draft of five meters, the Club Med 2 has six decks and accommodations for 410 passengers and 222 crew.

Passenger facilities include five suites and 196 outside cabins, including 150 two-person cabins, 35 cabins fitted with a Pullman bed, and six four-person cabins.

All cabins have individual bathroom, television, music, refrigerator and telephone. Other onboard amenities include: multipurpose lounge equipped for shows or seminars; terrace bar with night club equipment; two restaurants; a swimming pool bar; a casino; a hairdresser; massage and sauna area; an outside steering station from which passengers can steer the ship (under the guidance of an officer); multiple sporting activities; and a hospital with a doctor and nurse.

The vessel was constructed to conform with SOLAS, USCG, MARPOL and USPH (U.S. Public Health) requirements.

For additional information on the design and production capabilities of Ateliers & Chantiers du Havre,

Circle 25 on Reader Service Card

AHI Completes $1.1 Million Platform Modifications

Arab Heavy Industries Ltd. (AHI), a ship repair and fabrication yard in Ajman, United Arab Emirates, managed by Keppel Shipyard, has completed the reactivation and modification of two jack-up accommodation platforms.

The contract for both repairs, awarded by Mohammad Al-Mojil, was valued at $1.1 million.

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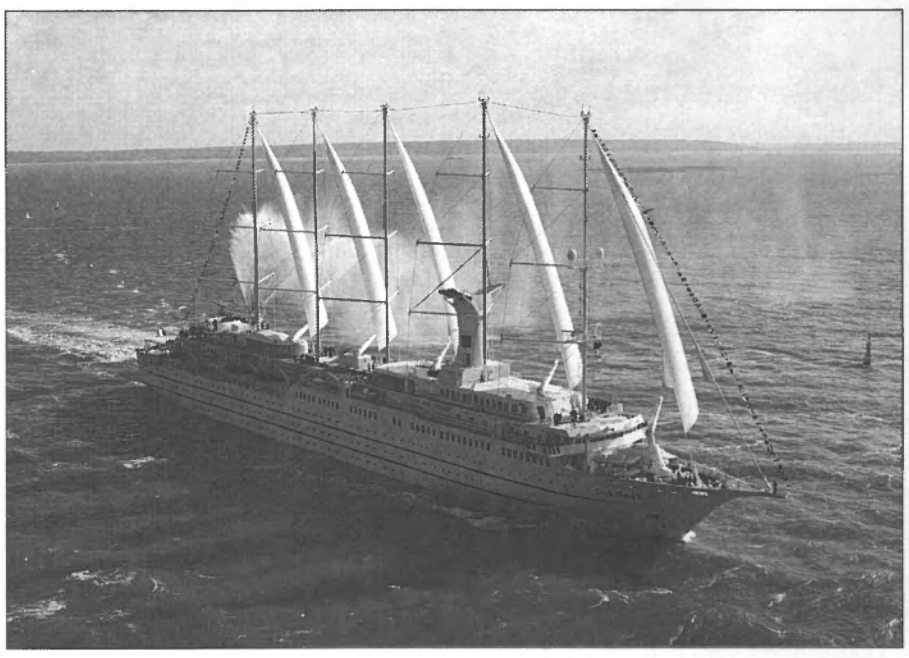
ACH Designs And Delivers The "Largest Sailing Robot," Club Mea 2 Sail Cruise Ship

Ateliers & Chantiers du Havre (ACH) recently delivered the Sail Cruise Liner "Club Med 2," to owner Copropriete Maritime. Operated by Club Med and Services Et Transports, the passenger liner's overall design is similar to her predecessor, "Club Med 1," delivered in 1990.

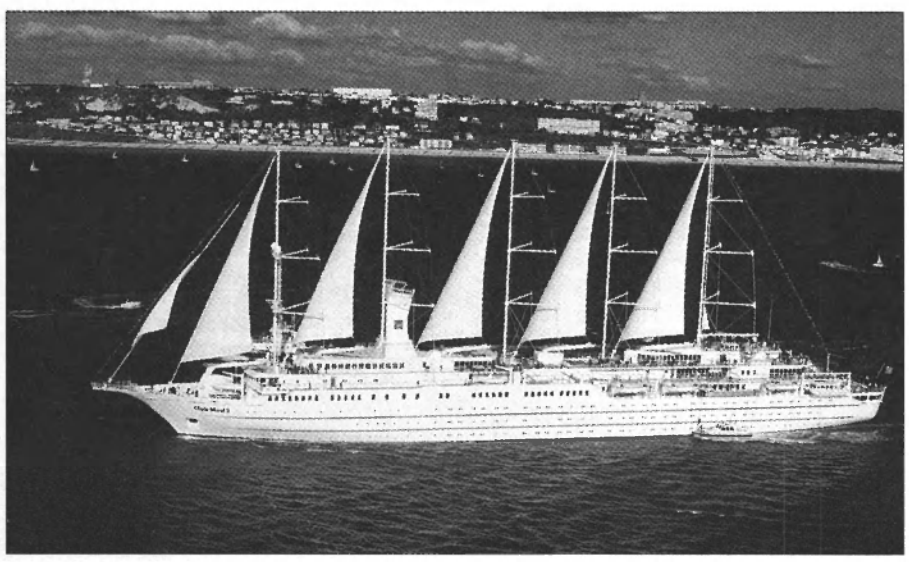
The Club Med 2 is fitted with sails which are totally automated and controlled by computer, and is propelled by an electric-diesel propulsion system. The propulsion system also includes four generator sets, creating 2,280 kW each; two electric propulsion motors, generating 2,940 kW each; two controllable pitch propellers, fully featherable for sail propulsion; one emergency genset; and two transverse thrusters, one fore and one aft.

The top speed under mechanical propulsion is 16.4 knots. In the event of an emergency, all sails can be furled within less than one minute, even without electrical power. Many active and passive, electronic and hydraulic safety devices have been included into what are said to be the largest sailing robots ever to have been built.

Communications equipment on the Club Med 2 consists of two satellite communication systems, telex and telefax, and VHF radio. For fresh water, the ship is equipped with two 145 t/day reverse osmosis plants and one fresh water treatment unit.



The "Club Med 2" recently delivered from ACH



The Club Med 2's sails are entirely computer-controlled

The ship is outfitted with an anti-roll stabilizer, which consists of two folding fins supplied by ACH. It also features two flap-type rudders and two bow thrusters.

With a length of 187 meters, a beam of 20 meters and a draft of five meters, the Club Med 2 has six decks and accommodations for 410 passengers and 222 crew.

Passenger facilities include five suites and 196 outside cabins, including 150 two-person cabins, 35 cabins fitted with a Pullman bed, and six four-person cabins.

All cabins have individual bathroom, television, music, refrigerator and telephone. Other onboard amenities include: multipurpose lounge equipped for shows or seminars; terrace bar with night club equipment; two restaurants; a swimming pool bar; a casino; a hairdresser; massage and sauna area; an outside steering station from which passengers can steer the ship (under the guidance of an officer); multiple sporting activities; and a hospital with a doctor and nurse.

The vessel was constructed to conform with SOLAS, USCG, MARPOL and USPH (U.S. Public Health) requirements.

For additional information on the design and production capabilities of Ateliers & Chantiers du Havre,

Circle 25 on Reader Service Card

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Tenmat Bearings Used On 'Queen of Scandinavia'

When the 25,940-ton Danish car ferry "Queen of Scandinavia" arrived at the Howald Deutche Werft yard in Kiel, Germany, for her annual overhaul, the vessel's gyro fin stabilizer flap mechanism was badly worn. The reported cause: excessive wear from the composite bearings used on the flap shafts, actuator shafts and actuator pin shafts. The yard's solution was to install Tenmat Feroform T12 composite bearings.

The "Queen of Scandinavia" was refitted with Tenmat Feroform T12 composite bearings.

The Feroform T12 is a bearing grade material containing molybdenum disulphide for low "stick/slip" qualities. Feroform is approved for submerged running in the Royal Navy (U.K.) and other navies throughout the world.

Tenmat Ltd. of Manchester, U.K., offers a comprehensive computerized design facility and a 24 hour manufacturing service delivering both large and small diameter bearings for emergency repair work situations.

For information on the Feroform T12 composite bearings and information on Tenmat,

Circle 55 on Reader Service Card

WesTech Teams With Lohmann + Stolterfoht For Military Sealift Program

WesTech Gear Corporation of Lynwood, Calif., a leader in high horsepower main reduction gear units for naval ship propulsion, has signed a teaming agreement with Lohmann + Stolterfoht of Witten, Germany, to supply new generation U.S. Navy sealift main reduction gears.

The agreement brings together two preeminent main reduction gear system manufacturers to produce a team ready to supply main reduction gear units meeting all requirements of the Military Sealift Program.

WesTech has been manufacturing marine main and accessory gear systems for high horsepower naval application for the last 50 years. The company's experience with systems for steam and gas turbine main engines includes more than 100 units for military application. Currently, WesTech is under contract to provide nuclear submarine equipment to the U.S. Navy and six 40,000 hp-main propulsion gear units for service ships outside the U.S.

Present manufacturing capacity allows WesTech to produce main propulsion gear units at the rate of one per month.

Lohmann + Stolterfoht, a division of Mannesmann Rexroth, is a leader in high horsepower diesel marine main reduction gear systems design and manufacture.

The company's experience with modern medium speed diesel twin input/single output gear units includes RO/RO cargo ships, cruise ships, tankers, container ships and a variety of other special purpose vessels. Lohmann + Stolterfoht has significant experience in the design and manufacture of gear units of the size required for the U.S. Navy's Military Sealift Program. The company's product line also includes the L+S Spiroflex Elastic Shaft Couplings and Pneumaflex Clutches.

For additional information on WesTech,

Circle 70 on Reader Service Card

For additional information on Lohmann + Stolterfoht,

Circle 71 on Reader Service Card

NAVY HOMEPORTS: UPDATE

Status Of The Navy's New Homeport At Everett, Washington

In the early 1980's, the Navy planned to expand the number of homeports to help accommodate the expected fleet expansion to 600 ships. In 1984, the Navy selected Everett as a site for one of the new homeports.

Because of land constraints at the Everett waterfront site and the closure of the naval station at Sand Point, the Everett homeport will consist of two sites. The main site of 117 acres will house the ships and the facilities necessary to provide ship berthing capabilities and waterfront support, supply and maintenance support, and installation and personnel support. The second site will consist of about 60 acres and will be located about 10 miles from the main site. It will have various morale, welfare, and recreational facilities, such as a commissary/exchange, an auto hobby shop, and a chapel.

As of July 31, 1992, the total cost to develop the Everett homeport had increased to $495.2 million, or 31 percent, more than the Navy's original (1985) estimate of $377 million. About $90 million of the increase represents base closure funds that will be needed to build facilities at Everett to accommodate activities being moved from Sand Point. With the first ship expected to arrive in 1994, the development schedule for the Everett homeport has slipped about six years.

The Navy has already received $282.4 million for the homeport. The Department of Defense (DOD) has requested $5.6 million in military construction funds and $58.4 million in base closure funds in the fiscal year 1993 budget. It is estimated that at least $148.8 million will be needed after fiscal year 1993.

The Navy now plans to base seven ships and 4,800 military personnel at Everett, compared to 13 ships and 6,800 military personnel in the original plan. The Navy stated that this decrease was due to significant reductions in the size of the fleet.

As a result of the 1991 decision to close the naval station at Sand Point, the Navy will move 18 tenant activities and 900 naval station and tenant personnel to Everett from Sand Point by 1995.

Several factors contributed to the $118.2 million cost difference. The Navy changed the configuration of the homeport and added projects that were not in the original estimate. In addition, projects that are funded with base closure funds and local contributions were not part of the Navy's original estimate. These funds and contributions are included in the current estimate because the projects they are funding are considered part of the homeport.

TABLE 1
Comparison of Original and Current Estimated Costs
(Dollars in Millions)

Source of Funding	Navy's 1985 Cost Estimate	Current Cost Estimate
Military Construction	$348.0	$371.4
Military Housing	0	20.7
Nonappropriated Funds	29.0	3.7
Local Contributions	0	9.5
Base Closure	0	89.9
Total	**$377.0**	**$495.2**

TABLE 2
Comparison of Ship Assignment Plans

Ship Type	Originally Planned	Currently Planned
Carrier	1	1
Cruisers	2	0
Destroyers	4	4
Frigates (active)	2	2
Frigates (reserves)	2	0
Mine Countermeasures (reserves)	2	0
Total	**13**	**7**

The configuration changes were a result of environmental concerns about the disposal of contaminated material dredged as part of the homeport construction. A 1988 litigation settlement with environmental groups changed the waterfront layout and the scope of other projects. For example, a central wharf was deleted because of the dredged material problems, and a structural breakwater was added.

The Navy also has added projects that were not envisioned when the original estimate was prepared. For example, the Navy planned to obtain a lease contract for steam; however, a lessor could not be found. The Navy now plans to construct a steam plant at a cost of $11 million. Also, the Navy has identified the need for 174 military housing units at a cost of $20.7 million. Originally, the Navy believed that the community could provide adequate affordable housing.

The use of base closure funds represents the most significant portion of the cost difference. Of the $89.9 million in base closure funds, $35.7 million will be used for land acquisition, site improvements and utilities, and access roads to the second site. An additional $21.5 million will be used to construct a fleet headquarters support building and a port services addition at the main site and various facilities such as playing fields and courts, a chapel, bachelors' officers quarters, and a fleet parking area at the second site. In addition, $9.5 million in local contributions were obtained from the state of Washington and the port of Everett and were used for road improvement.

Initially, Everett was to receive its first ship, the aircraft carrier USS Nimitz, in December 1988, and all ships were to arrive within two to three years thereafter. The plan now calls for the first two ships (frigates) to arrive in 1994, two destroyers to arrive in 1995, and two destroyers and the carrier to arrive in 1996.

Navy officials state that the decrease in the number of ships did not significantly affect the site development or total costs because a carrier will still be homeported at Everett and its requirements primarily dictate site development. They stated that carrier requirements are much greater than all other ships.

Pursuant to the Defense Base Closure and Realignment Act of 1990 (P.L. 101-510), the naval station at Sand Point is scheduled for closure in 1995. DOD's April 1991 base closure report states that the closure has a direct bearing on the development of the Everett homeport. Sand Point has 52 tenant activities, of which 18 will transfer to Everett, and the remaining 34 will go to various other locations, primarily in Washington State. About 900 personnel associated with the naval station and the 18 tenant activities will transfer to the new homeport.

For example, upon completion of the administration and fleet headquarters building at Everett, some Sand Point tenant activities, such as the Naval Investigative Service and the Naval Legal Services Office, will relocate to Everett. Everett's second site is planned for completion by the summer of 1995 to coincide with the closure of Sand Point.

The Navy is using Sand Point base closure funds to accommodate the many facilities and quality-of-life projects to be relocated to Everett. According to DOD, the Navy has planned to provide this support for Everett from existing facilities at Sand Point.

The Navy is proceeding with the development of the new homeports.

Jered Brown Brothers' New Focus, Facilities, Help Win New Business And Retain Current Clients

Jered Brown Brothers, over the last five years, has transformed itself from a traditional marine equipment subcontractor for major world shipyards into a systems engineering house capable of serving as prime contractor on turnkey, diversified naval and commercial projects.

The company has nearly finished the transformation despite the fact that it has completely relocated its operation in the past year, and through the diversion of twice winning (and twice having competitors file protests over) the biggest contract award in its 46 year history.

"We certainly don't want to create the impression that we are withdrawing from, or neglecting, our current shipyard customers and traditional products," said Jered president, **Rick Edger**. "But during this period of marine market contraction, we have been concentrating on expanding our role to include that of a prime contractor to the U.S. Navy and to other navies.

"Relocating and consolidating our operations this year on a deep-water site in Brunswick, Ga., in vastly larger facilities than we had in Detroit, has provided us with the manufacturing space and shipping capabilities we need," Mr. **Edger** continued. "And winning the Navy's ELCAS contract twice in the past year is solid evidence that we have had some positive success."

The ELCAS (Elevated Causeway System) is a modular cargo unloading platform that is part of the Navy's Strategic Sealift Program. Jered Brown Brothers won the original contract in December 1991, only to have it terminated in early 1992 as a result of a competitor's lawsuit. Jered won the rebid in September 1992, only to have work stopped a second time on the basis of a competitor's protest.

Interior view of Jered Brown Brothers' largest building

"We weren't the low bidder on the project; we won the contract both times on the basis of our outstanding technical proposal," Mr. **Edger** said. "We think it's just a matter of time before the GAO clears up the protests and gives us the go-ahead."

When the project is green-lighted, activity will increase significantly at the company's 225,000-sq.-ft. "Liberty Works" manufacturing plant. The facility, which is set on a 110-acre site with over 1,000 feet on the Brunswick River, sits adjacent to the Georgia Ports Authority and is six miles from the Atlantic.

In addition to its large-scale manufacturing operation at the Liberty Works, Jered has a separate business unit devoted to a market niche: vacuum collection, hold and transfer sewage system (VCHT).

The VCHT unit designs, manufactures and makes vacuum products and systems for commercial, passenger and military ships, yachts, boats sailing vessels and recreational vehicles, and other non-maritime transportation modes.

Compact and lightweight, the Jered VCHT system requires only two pints of water per flush.

Also headquartered in the Liberty Building is Jered's customer support group, which provides total system parts and service support. Full field service support is provided with service representatives located in San Diego, Norfolk, Jacksonville and Pascagoula/New Orleans. In addition, the Customer Support Group services all aspects including spare parts, of the FFG-7 Fin Stabilizer System and other equipment originally manufactured by Jered's sister companies, Brown Brothers, Michell Bearings, Stone Vickers and KaMeWa A.B.

Mr. **Edger** claims the move to larger facilities has already paid off with new business for large cranes, orders that could not have been built in the company's former facilities. The first order is for a 200-foot high, 40-ton container crane for the Port of Jacksonville, Fla., and the second is for the fabrication of two 125-ton bridge cranes, each 200 feet long, for the U.S. Navy's Kings Bay, Ga., submarine base.

Today, Jered deck edge elevators are at work on virtually the entire fleet of U.S. Navy aircraft carriers, plus those of France and Spain; retractable bow planes on Los Angeles Class, (SSN-688) submarines; hydraulic steering equipment is aboard CVN carriers, Spruance (DD 963) Class destroyers, Perry (FFG 7) Class frigates, and Ticonderoga (CG 47) Class Aegis cruisers.

For additional information on Jered Brown Brothers products and facilities,

Circle 73 on Reader Service Card

Hydrasearch Expands Its Fueling-At-Sea Line

Hydrasearch Company, a manufacturer of fueling at sea equipment for Navy ships, has expanded its products to include solid cargo and vertical underway replenishment (UNREP) equipment.

Hydrasearch's equipment includes probes and probe receivers, robb couplings, NATO couplings, hose assemblies, saddles and related equipment required for alongside and astern fueling. Solid cargo UNREP equipment includes transfer chairs, trolleys, star latches and probes, pelican hooks, traveling surfs and equipment to transfer pallets.

For additional information on the equipment and capabilities of Hydrasearch Company,

Circle 56 on Reader Service Card

WDC Offers Sensor, Torsionmeter System To Shipping Industry

Wireless Data Corporation, a leading manufacturer of telemetry-based systems for gathering, transmitting and receiving sensor data from rotating machinery, offers two new models to shipbuilders, the model 1602A Torsionmeter System and the model 1650B Sensor.

The Torsionmeter system allows for accurate measurement of power, on diesel, steam and gas turbine propulsion systems, on vessels from towboats to 500,000-dwt tankers. The model 1602A is the company's most cost effective unit, and the manufacturer assures maintenance free operation and long term stability.

The model 1602A is currently used in a variety of applications, including fuel conservation programs, hull and propeller fouling, load balancing on twin screw vessels, power plant monitor and sea trials torsionmeter.

The unit features a patented dual bending beam sensor secured to the propeller shaft, which continuously monitors and transmits torque data regardless of vessel trim, list or operating environment.

The model is usable on vessels with power up to 100,000 hp per shaft, at 2,500 rpm's, on shaft sizes 2.5 through 32 inches.

The model 1650B sensor is good for obtaining torque from machinery where little downtime can be afforded. The sensors are calibrated at the factory, and ideal for shafts sized between 2.5 and eight inches.

The running limit is 2,500 rpm for a 2.5-inch diameter unit, dropping to 1,500 rpm for the eight-inch unit.

Ready-to-use model 1650B sensors convert power I/O shafts into torque transducers in 15 minutes or less. The quick torque sensors are ideal, according to the manufacturer, for those applications involving repetitive testing of identical systems, such as small boat propellers, motor driven pumps and low-speed power take-offs.

The model 1650B sensor consists of a patented deflection sensor mounted to a pair of clamp rings. Each clamp ring has an inner blunt knife edge which aids in defining a specific shaft length. The sensor monitors any twisting due to torque over this length.

For additional information on WDC's model 1602A torsionmeter system,

Circle 58 on Reader Service Card

For additional information on WDC's model 1650B sensor,

Circle 59 on Reader Service Card

USS VICKSBURG JOINS ATLANTIC FLEET—USS Vicksburg (CG 69), the 16th Ticonderoga (CG47) Class Aegis guided missile cruiser built for the U.S. Navy by Ingalls Shipbuilding division of Litton, in Pascagoula, Miss., sails through the Gulf of Mexico during her predelivery sea trials. The new cruiser was recently commissioned into the U.S. Atlantic Fleet at Naval Station Pascagoula.

Volvo Penta

The 42 And 72 Series Engines For Marine Commercial Applications

Volvo Penta has expanded its range of marine commercial diesels with two new products under the performance designation of Special Light Duty (SLD) for planing vessels.

Volvo Penta reports that each engine offers high performance and a superb power-to-weight ratio along with reliability, fuel economy and low emission levels.

A Supercharged Diesel

Designated the KAD42/DP, with Volvo Penta's counter-rotating Duoprop inboard/outboard drive, and the KAMD42 inboard, these new engines have been developed exclusively for marine operations.

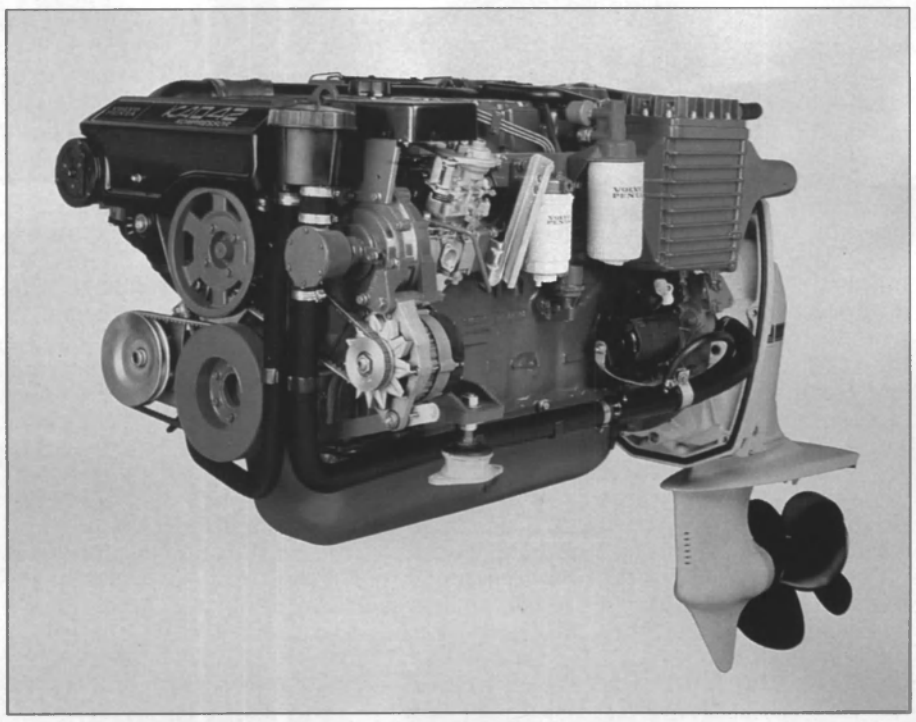
Both engines have been equipped with a combination of turbocharging and mechanical compressors to achieve very high torque output, even at low engine speed. Acceleration is then increased by as much as 40 percent compared with previous generation engines in this series.

It should be noted that the 42 series will not replace the 41 series, but will complement it by meeting higher output requirements in craft of 26 feet to 35 feet with single or twin installations.

The power output of 230 hp and the high torque have been achieved with low exhaust emissions and without sacrificing fuel consumption at cruising speed, through use of an upgraded combustion technology. The unique properties of the Volvo Penta Duoprop counter-rotating propeller inboard/outboard drive in terms of acceleration, responsive handling and comfort are all enhanced by the compressor engine.

A New Engine Concept

With the KAD42/DP and KAMD42 and the adoption of a mechanical compressor, Volvo Penta has introduced a new idea in marine engine development. The belt-driven compressor provides a high volume of charge air, even at the lowest engine speed, to boost torque.



Volvo Penta's new KAD42/DP engine.

For example, at 2,000 rpm the output is 375 ft. lbs. of torque, even though the peak power is not achieved until 3,800 rpm.

The KAD42/DP reportedly gives 25 percent better acceleration up to 20 knots in a 28-foot boat of 10,000 pounds using two engines than a similar boat powered with TAMD41's. In an 8,000-pound boat with a single engine, acceleration is about 40 percent better up to the same speed.

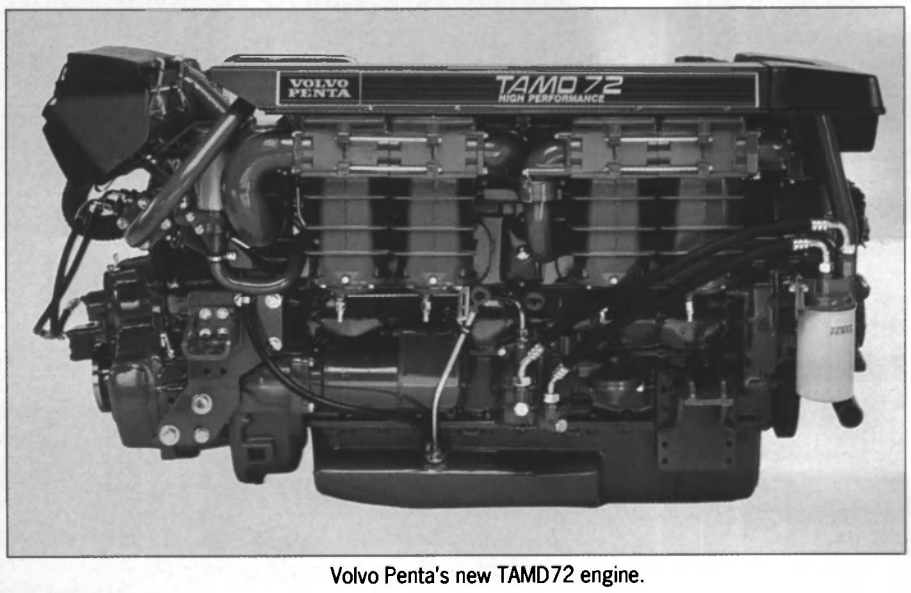
The engine itself is compact with a good weight/power ratio of 2.4 kg/hp, including Duoprop and power steering. The increase of 30 hp at the crankshaft over the 41 series engine has been achieved without sacrificing low exhaust emissions or fuel consumption at cruising speed.

In operation, when accelerating the throttle to maximum, a "kick-down" function engages the compressor right up to 3,100 rpm. The pressure in the turbo increases steadily and takes over completely at 3,100 rpm. The compressor also cuts in and out automatically when cruising: on the KAD42/DP it operates between 1,700 and 2,500 rpm; on the KAMD42 between 1,700 and 2,300 rpm. As the compressor takes over when required, the engine is less sensitive to load.

The TAMD42WJ: Exclusively For Waterjet Applications

This variant of the 42 series engine is designed specifically for use with waterjet drives.

As a waterjet has little resistance at low speeds, this engine is able to dispense with the compressor and is equipped with a turbocharger that is matched to the engine's full power requirements.



Volvo Penta's new TAMD72 engine.

The New 430-hp TAMD72: 430 hp At 2,600 rpm

The new TAMD72 also achieves high performance—430 hp at 2,600 rpm from a 6.7 liter engine—and the torque is equally impressive over a wide range of engine speeds, peaking at 960 ft. lbs. at 1,600 rpm.

Together these features help boats deliver increased top speeds and quicker acceleration with less sensitivity to load.

The performance increase is achieved with upgraded technology that includes improved combustion chamber design, a new injection pump and a waste-gate turbocharger. It also results in lower exhaust emissions.

The adoption of a waste-gate turbocharger is a new development in marine diesels. By limiting the turbo speed above an engine rpm of 1,600-1,700 rpm, the waste-gate enables a turbocharger with a much smaller turbine wheel than usual to be used.

This turbo helps achieve faster acceleration and higher torque output at lower engine speed. In operation, the waste-gate acts as a valve for gases to by-pass the turbo when optimum intake pressure has been achieved, and it also ensures lower fuel consumption at lower engine speeds.

For free literature describing the KAD42/DP and KAMD42,

Circle 52 on Reader Service Card

For free literature describing the TAMD42WJ,

Circle 53 on Reader Service Card

For free literature describing the TAMD72 engine,

Circle 54 on Reader Service Card

Technical Details	KAD42/DP KAMD42	TAMD42WJ	TAMD72
No. of cylinders	6	6	6
Displacement liters	3.6	3.6	6.7
Compression ratio	17.8:1	17.8:1	15.6:1
Crankshaft horsepower	230	230	430
Maximum rpm	3800	3800	2600
Maximum torque, ft lbs	375	---	960
Max torque RPM	2000	---	1600
Dry weight, lbs.	1,015	926	1,962

BUYERS DIRECTORY

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

ABRASIVES
Barton Mines Corp., 1658 Cole Blvd., Golden, CO 89401
Bourg Drydock, P.O.Box 1852, Houma, LA 70361
Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Ervin Industries, Inc., 3893 Research Park Drive, P.O. Box 1168, Ann Arbor, MI 48106-1668

AIR CONDITIONING AND REFRIGERATION—Repair & Installation
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Carrier Transicold, P.O. Box 4805, Syracuse, NY 132211
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Stal Refrigeration AB, Butangsgatan 16, S-601 87 Norrkoping, SWEDEN
York International Corporation, P.O. Box 1592-083M, York, PA 17405-1592

BALLAST
Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., P.O. Box 986, Sonoita, AZ 85637

BARGE BUILDING
Conrad Industries, P.O. Box 790, Morgan City LA 70381
Maxon, South Boundary Street, P.O. Box 69, Tell City, IN 47586
Caruthersville Shipyard, Inc., D/B/A St. Louis Ship, P.O.Box 1134, Caruthersville, MO 63830
Zidell Marine Corp., 3121 S W Moody Ave., Portland, OR 97201

BARGE COVERS
Syntechnics Inc., FRP div. 700 Terrace Lane, Paducah, KY 42003
Xenium Fiberglass Corp., P.O. Box 2696, Paducah, KY 42002

BARGE—Leasing
McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell Marine Corp., 3121 SW Moody Ave., Portland OR 97201

BASKET STRAINERS
Beaird Industries, P.O. Box 31115, Shreveport, LA 71130

BEARING—Rubber, Metallic, Non-Metallic
B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401
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

BOILER—Manufacturers
Aalborg Ciserv (Miami) Inc., 2449 Northeast 13th Avenue, Ft. Lauderdale, FL 33305

BROKERS
151 Maritime Services, 34062 El Encanto/B, Dana Pt. CA 92629
Captain Astad Company, Inc., P.O. Box 350486, Ft Lauderdale, FL 33335,
2900 Energy Centre, 1100 Poydras Street, New Orleans, LA 70163-2900
Diversified Marine Brokerage, 1201 Northern Blvd., Manhasset, NY 11030
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

BUNKERING
Crowley Maritime, 155 Grand Ave., Oakland, CA 94612
Zidell Marine Corp., 3121 SW Moody Ave., Portland OR 97201

CABLE ASSEMBLIES
Revere Aerospace, 845 N. Colony Rd. Wallingford, CT 06492

CARGO HANDLING EQUIPMENT
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108

CHAIN
Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
G.J. Wortelboer Jr. B.V., Postbus 5003, 3008 AA Rotterdam, NETHERLANDS

CHEMICALS
Unitor Ships Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

CLAMPING—Pipe, Tubes, Hose
ZSI, 12749 Richfield Ct., Livonia, MI 48150

CLASSIFICATON SOCIETY
American Bureau of Shipping, 2 World Trade Center, 106th Fl, New York, NY 10048

COMPACTORS
A/S Vesta, Skudehavsvej 27, DK-2100 Copenhagen, DENMARK;
Sales Agents: American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906,

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

COMPUTERIZED INFORMATION SYSTEMS
Coastdesign, Inc., Unit 201, 12837 76th Avenue, Surrey, BC CANADA V3W 2V3
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
Wright Austin Co., 3250 Franklin St., Detroit MI 48207

CONTROL SYSTEM—Monitoring
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Autronica Marine A/S, Drammensveien 126, N-0277 Olso 2, NORWAY
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Lyngso-Valmet Marine A/S, P.O. Box 130, N-3430 Spikkestad, NORWAY
MMC International, 60 Inip Dr, Inwood NY 11696
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Norcontrol A/S, P.O. Box 1024, N-3191 Horten, NORWAY
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Row Technology, P.O. Box 265, Littlestown, PA 17340
Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Dr., Alpharetta, GA 30202
Teleflex Naval technologies, 205 Church Rd., North Wales, PA 19454

COUPLINGS
Lo-Rez Vibration Control Ltd., 156 West 8th Avenue, Vancouver, BC CANADA, V5Y 1N2

CRANE—HOIST—DERRICK—WHIRLEYS
Bisso Marine Co. P.O. Box 4113, New Orieans, LA 70178
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Cross Equipment Inc., P.O. Box 446, Houma, LA 70361
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Hagglunds Inc, Marine Div. Headq., 50 Chestnut Ridge Rd, Montvale, NJ 07645
Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus Hebezeugue GmbH, D-5810 Witten, GERMANY
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883
Smatco Industries, P.O. Box 4036, Houma, LA 70361
Westmont Inds, 10805 Painter Ave, Santa Fe Springs, CA 90670
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

DECK MACHINERY—Cargo Handling Equipment
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Cross Equipment Inc., P.O. Box 446, Houma, LA 70361
MacGregor-Navire Group, 34 Bedford Rd., Clapham North, London SW4 7HH
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788
McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032
Smatco Industries, P.OBox 4036, Houma, LA 70361
Willem Pot b.v., P. O. Box 29102, 3001 GC Rotterdam, The Netherlands

DECK MACHINERY
Boatlife, 205 Sweet Hollow Road, Old Bethpage, NY 11804
Cross Equipment, Inc., P.O.Box 446, Houma, LA 70361
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Nordic machine Mfg., 4700 Balard Ave, NW, Seattle, WA 98107
Smatco Industries, P.O.Box 4036, Houma, LA 70361
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108

DIESEL ACCESSORIES
Coltec Industries Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Gearhardt's Inc., P.O. Box 10161, Jefferson, LA 70181
General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360
Giro-Engineering Ltd., 370 Brook Ln., Salisbury Hampshire, ENGLAND SO36ZA
Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101
Pow-R-Quik, 5518 Mitchelldale, Houston, TX 77092

DIESEL ENGINE—Spare Parts & Repair
Aalborg Ciserv (Miami) Inc., 2449 Northeast 13th Avenue., Ft. Lauderdale, FL 33305
Caltax Marine Diesel B.V., Stationsweg 6a, 4416 ZH Kruiningen , THE NETHERLANDS
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610
Coltec Industries, Parts & Service Div., 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Mail Code 60011, Box 3005, Columbus, IN 47202-3005
John Deere, John Deere Rd., Moline, IL 61265
Global Maritime Services, 247 SW 33 Court, Ft. . Lauderdale, FL 33315
Golten Marine Company Inc., 160 Van Brunt St., Brooklyn, NY 11231
Hall-toledo, Inc., 525 West Sophia St., Maumee, OH 43437
Hatch & Kirk, 5111 Leary Avenue NW, Seattle, WA 98107
Kim Hotstart Mfg Co., E 5724 Broadway Ave, P.O. Box 42, Spokane WA 99210
MAN B&W Diesel AG, Stadtbachstrasse 1, D-8900 Augsburg 1, GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MTU of North America, 10450 Corporate Dr., Houston, TX 77478
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY
National Maintenance & Repair, Foot of Hawthorne, Hartford, IL 62048
New Sulzer Bros., Inc, 200 Park Ave, New York, NY 10166
Pacific Rim Diesel, 3842 W. Marginal Way SW, Seattle, WA 98106
Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW, ENGLAND;
Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084
Wartsila Diesel, 709 Morgnec Rd., Chestertown, MD 21620

DIVING & SALVAGE
Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183
Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731
Sea-Side Diving, 28612 Harper Ave., St. Clair Shores, MI 48081

DRILLING & BLASTING
Marine Drilling & Blasting, PO Box 10455, Jacksonville, FL 32247-0455

DRY DOCKS-Design
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Curacao Drydock (USA), PO Box 3012, Curacao, Netherlands Antilles
Ferrostaal AG, D-4300 Essn, Hohenzollernstrasse 24, GERMANY
Marine Design Services, P.O. Box 928, Bonita CA 92002

ELECTRICAL EQUIPMENT
Bender Inc, 400 Gordon Dr, Bldg 501, Exton, PA 19341
L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orieans LA 70150
MMC International, 60 Inip Dr, Inwood NY 11696
Row Technology, P.O. Box 265, Littlestown, PA 17340
SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116
Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Drive, Alpharetta, GA 30202
Universal Marine Electric Co., Inc., P.O. Box 266-923, Houston, TX 77027-6923

ELECTRONIC DISPLAY
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ELECTRONIC ENCLOSURES
A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

ELECTRONIC INFORMATION SUPPORT
Inventory Locator Service, 3965 Mendenhall Rd. S., Suite 10, Memphis, TN 83115
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ENGINE TEST EQUIPMENT
Amot Controls, PO Box 1312, Richmond, CA 94802
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Rd., Plymouth, MA 02360
Instruments, Computers, & Controls, Inc., 6942 Haven Creek Dr., Katy, TX 77449

EPIRBS
ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale FL 33310-5247
Alden Electronics, 40 Washington St., Westborough, MA 01581
Litton Special Devices, 750 W. Sprout Road, Springfield, PA 19064

EQUIPMENT-Marine
Byrne, Rice & Turner, Inc., 1172 Camp St., New Orieans, LA 70130
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302

EVAPORATORS
Alfa-Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Aqua-Chem, Water Technologies Div., P.O. Box 421, Milwaukee, WI 53201
Beaird Industries Inc., P.O. Box 31115, Shreveport, LA 71130

FANS-VENTILATORS BLOWERS
Carling Turbine Blower Co., 8 Nebraska St., P.O. Box 15048, Worcester, MA 01615-
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS
Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Revcar Fasteners, P.O. Box 345, Roanoke, VA 24003
Robbins Manufacturing, 1200 Airport Rd., Fall River, MA 02722

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
Rowe Bumpers, Conveyors & Caster Corp., 3501 Detroit Ave., Cleveland, OH 44113
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 GRATING
International Grating, Inc, 7625 Parkhurst, Houston, TX 77028

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

FIRE DETECTION SYSTEMS
Autronica Marine A/S, Drammensveien 126, N-0277 Olso 2, NORWAY
Unitor Ships Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

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

FRICTION COMPONENTS/PARTS
Champion Friction Co. 845 McKinley St., Eugene, OR 97440

FUEL ADDITIVES, CONDITIONING
Hammonds Fuel Additives, PO Box 38114-407, Houston, TX 77238-8114

GALLEY EQUIPMENT
Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062
Gaylord Industries, 10900 S W Avery St, P.O. Box 1149, Tualatin, OR 97062
Lang Manufacturing, P.O. Box 905, Redmond, WA 98073

GANGWAYS, LADDERS
Coast Marine & Industrial Supply Inc., 398 Jefferson St., San Francisco, CA 94133
Sea Systems Inc., 65 Avco Road, Ward Hill, MA 01835
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

GENERATORS
Tech Systems, 401 Watertown Rd., Thomaston, CT 06787

GROUND FAULT PROTECTION & LOCATION EQUIPMENT
Bender, inc., 400 Gordon Drive, Bldg. 501, Exton PA 19341

HEAT EXCHANGERS
Alfa-Laval Separation Inc., 955 Mearns Rd., Warminster, PA 18974
American United Marine Corp., 5 Broadway, Rt.1, Saugus, MA 01906
A/S Vesta, P.O. Box 548, DK-9100, Aalborg, DENMARK US Agent: Aalborg Ciserv Houston,, Inc., P.O. Box 906, Angleton, TX 77515
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
Tranter Inc, Old Burk Road, Wichita Falls, TX 76307

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

HYDRAULICS
Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Maumee, OH 43537-0631
American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072

INCINERATORS
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
A/S Vesta, P.O. Box 548, DK-9100 Aalborg, DENMARK. U.S. Agent: Aalborg Ciserv Houston, Inc., P.O. Box 906, Angleton TX 77515

INSULATION
Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729

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

JET PROPULSION SYSTEMS
North American Marine Jet, P.O. Box 1232, Benton, AR 72015

JOINER—Watertight Door—Paneling—Ceiling System—Decking
GEC-Marconi Electronic Systems Corp., 550 S. Fulton Ave., Mt Vernon, NJ 10550
IMAC AB, Berga Alle 1, S-25255 Helsingborg, SWEDEN
U.S. Rep: Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave., Boca Raton, FL 33431
Marine Accommodations Inc., 8535-3 Baymeadows Rd., Se 140, Jacksonville, FL 32256
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

KEEL COOLERS
R.W. Fernstrum & 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
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
The L.C. Doane Co., P.O. Box 975, Essex, CT 06426
Nautilus Equipment Ltd., P.O. Box 66, Station M, Halifax, Nova Scotia B3J 2L4, CANADA
Phoenix Products, 6161 N 64th St., Milwaukee WI 53218

LINE BLINDS
American Piping Products, Inc., 22 S. 9th St., New Hyde Park, NY 11040
Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LIQUID CARGO HEATERS
First Thermal Systems, Inc., P.O. Box 4756, Chattanooga, TN 37405

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

LOGISTICS
VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564
QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455

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 Ssytems, 800 Ferndale Pl., Eahway, NJ 07065

MACHINING—On Site Repair
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

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, 3457 Guignard Dr., Hood River, OR 97031

MARINE FURNITURE
Directions In Design, 633 Emerson, Ste. 100, St. Louis MO 63141
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 Srevices, 3457 Guignard Dr., Hood River, OR 97031
Wilson & Hayes, 1601 Eastlake Avenue, East, Seattle, WA 98102

MARINE SHIP MANAGEMENT
Arkhon Corp., 1810 Chapel Ave. West, Cherry Hill, NJ 08002

METAL PRODUCTS
Jamestown Metal Marine Sales, Inc., 4710 N.W. Second Ave., Boca Raton, FL 33431
Harrington Metal Fabrication, P.O. Box 410, 6720 M 89, Fennville, MI 49408

MOTORS
Tech Systems, 401 Watertown Rd., Thomaston, CT 06787

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
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
Arctec Offshore Corp., 578 Enterprise St., Escondido, CA 92025
CDI Marine Co., 9487 Regency Square Blvd., Ste. 500, Jacksonville, FL 32225
CT Marine, 18 Church St., Georgetown, CT 06829
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 Ridgelake Dr., Suite 403, Metairie LA 70002
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, 2611 Jefferson-Davis Hwy, Ste. 3000, Arlington, VA 22202
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
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
JJH 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., Slidell, 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, Seacliff, 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 Jermantown 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, Barnegat Light, NJ 08006; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041; 1305 Franklin St., Suite 210, Oakland, CA 94612.
George G. Sharp, Inc., 100 Church St., New York, NY 10007
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
TIMSCO, P. O. Box 91360, Mobile AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT
Anschutz & Company, One Madison St., East Rutherford, NJ 07073
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
EDO Corporation, 2645 S 300 West, Salt Lake City. UT 84115
Electronic Marine Systems, 800 Ferndale 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 Aero-Nautical Communications, 15245 Shady Grove Rd, Rockville, MD 20850
Kenwood USA Corp., Marine Prod. Div., 2201 E. Dominquez St., Long Beach, CA 90810
Mackay Communications, 441 US Highway #1, P.O. Box 331, Elizabeth NJ 07207
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
Naval Electronics, 5417 Jetview Circle, Tampa FL 33634
Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY
Novatech, 820 Cormorant St., Victoria, BCV8W1R1, CANADA
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, 1921033rd Avenue West, Lynwood, 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

NOZZLES
Harrington Metal Fabrication, P. O. Box 410, 6720 M 89, Fennville, MI 49408

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 Mearns Rd., Warminster, PA 18974-0556
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale NJ 07647
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
MMC International, 60 Inip Dr. Inwood NY 11696
National Ruid Separators, 827 Hanley Industrial Ct, St Louis, MO 63144
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 Amessen Corp., Corrosion Dynamics Div., 1100 Walmut St., Rosell, NJ 07203
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502
GlobalTech, 9801 Westheimer St., Ste. 202, Houston, TX 77042
Jamestown Distrib., 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Hempel Coatings, Foot of Curie Avenue, Wallington, NJ 07057
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
Sigma Coatings, 8979 Market St., Houston, TX 77029, 330 Rover Rd., Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030

PIPE FITTINGS/CONNECTING SYSTEMS
Aeroquip Corp., 1695 Indian Wood Cir., Maumee, OH 43537-0631
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Lokring, 396 Hatch Drive, Foster City, CA 94404
Stanley G. Flagg Co., 1020 W. High St., Stowe, PA 19464

PORT SERVICES
Port of Portland, 5555 N. Channel Ave., Portland, OR 97217

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Avondale Industries, Harvey Quick Repair, P.O. Box 116, Harvey, LA 70058
American Air Filter, P.O. Box 35690, Louisville, KY 40432
ASEA Brown Boveri, 1460 Livingston Avenue, N. Brunswick, NJ 08902
ASEA Brown Boveri (Stromberg), P.O. Box 185, 00381 Helsinki, FINLAND
Argo International, 140 Franklin St., New York, NY 10013
Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND
Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081
CWF Hamilton & Co., Ltd., P.O. Box 709, Christchurch, NEW ZEALAND
Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320
Coltec Industries (Fairbanks Morse Engine Div.), 701 Lawton Ave, Beloit, WI 53511
Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005
Electro-Motive, div. General Motors, 9301 W 55th St, La Grange, IL 60525
Fincantieri, Diesel Engines Div—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
Fundiciones RICE, AV Rios Espinoza No. 88, COL BENITO JUAREZ, Mazatlan,
GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420
Harbormaster Marine,
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp MaK, 7555 Danbro Crescent, Mississauga, Ontario, CANADA L5N 6P9
Mapeco Products Inc., P.O. Box 6, 725 Glen Cove Ave., Glen Head NY 11545
Marine Gears, Inc., P.O. Box 689, Greenville MS 38707
Markisches Werk, P.O. Box 1442, D-5884 Halver GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Holeby, DENMARK
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15. DK-9900 Frederikshavn DENMARK
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 GERMANY
MKW Power Systems, 301 S. Church St., Rocky Mount, NC 27801
Mitsubishi Heavy Industries America, Inc., 630 Fifth Ave., Ste. 3450, NY, NY 10011
New Sulzer Diesel, Ltd., CH-8401, Winterthur, SWITZERLAND
Nylands Marine Service A/S, P.O. Box 130, N-4818 Faervik, NORWAY
Omnithruster Inc., 9515 Sorensen Ave., P.O. Box 2144, Santa Fe Springs, CA 90670
Ovako Steel Couplings AB Sweden, S-813 00 Hofors SWEDEN
Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND
Rolla SP Propellers USA, 4030 Mustang Road, Melbourne, FL 32934, USA
Kart Senner Inc., 25 W Third, Kenner LA 70062
Schottel-Werft, D-5401 Spay, GERMANY
Siemens Energy & Automation, Inc., Systems Div., Marine Systems no. America (A23N), 100 Technology Dr., Alpharetta, GA 30202
Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey LA 70059-0008
Textron Lycoming, 550 Main St., Stratford, CT 06497
Thrustmaster of Texas, 12227-K FM 529, Houston, TX 77041
J. M. Voith GmbH, Marine Division, Postfach 1940, D-7920, Heidenheim/Brenz, GERMANY U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Oy Wartsila Ab, Vasa and Abo Divisions, P.O. Box 244, SF65100 Vasa, FINLAND
WesTech Gear Corp., 2600 E. Imperial Highway, Lynwood, CA 90262
Westinghouse Marine Div., 401 E Hendy Ave, Sunnyvale, CA 94088
ZF of North America, Marine Sales, 500 Barclay Blvd, Lincolnshire IL 60069

PROTECTIVE WRAPS
FANA (Film Applicators of North America), 1260 E Woodland Ave., Springfield PA 19064

PUMP—Repair—Drives
Beckson Marine, 165 Holland Ave, Bridgeport, CT 06605
Coffin Turbo Pump, Inc., 326 S. Dean Street, Englewood, NJ 07631
Del Gavio, 619 Industrial Rd., Caridstadt, NJ 07072
Dresser Pump 401 Worthington Ave., Harrison, NJ 07029
Golten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101
Leistritz Corporation, 165 Chestnut Street, Allendale, NJ 07401
Vita Motivator, 99 W Hawthorne Ave., Suite 622, Valley Stream NY 11580

REFRIGERATION EQUIPMENT/SERVICES
Unitor Ships Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

REMOTE VALVE OPERATORS
American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906
S. S. White Technologies, Inc., 151 Old New Brusnwick Rd., Piscataway, NJ 08854
Teleflex, Inc., 771 First Ave., King of Prussia, PA 19406

ROPE—Manila—Nylon—Hawsers—Fibers
Allied Signal Inc., Fibers Division, 1411 Broadway, New York, NY 10018
American Manufacturing Co., 200 S. Park Rd, P.O. Box 52125, Lafayette, LA 70505
Dupont, Montgomery 403, 1011 Centre Road, Wilmington, DE 19805
United Ropeworks (USA), Inc., 151 Commerce Dr., Montgomeryville, PA 18936

SANITATION DEVICE—Pollution Control
Jered Brown Brothers, 56 South Squirrel Rd., Auburn Hills, MI 48326
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
Microphor, Inc., 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490
Red Fox Environmental Services, Inc., P.O. Box 53809, Lafayette, LA 70505-3809
Research Products/Blankenship (Incinolet), 2639 Andjon, Dallas, TX 75220

SCALE MODELS
Sturgeon Bay Model Shop, 187 N Ninth Ave., Sturgeon Bay WI 54235

SCUTTLES/MANHOLES
L S. Baier & Assoc., 7527 NE 33rd Dr., Portland OR 97211

SHIPBUILDING EQUIPMENT
NEI Syncrolift, Inc., 8970 S W 87th Ct., Miami FL 33176

SHIPBUILDING—Repairs, Maintenance, Drydocking
Astilleros Espanoles S.A., Padilla 17, 28006 Madrid, SPAIN
Atlantic Marine, Inc., P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., 8500 Heckscher Dr., Jacksonville, FL 32226
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150
Bender Shipbuilding & Repair, P.O. Box 42, Mobile AL 36601
Bender Inc., 400 Gordon Drive, Bldg. 501, Exton, PA 19341
Beth Ship, Sparrows Point Yard, Sparrows Pont MD 21219
Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178
Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374-0250
Bourg Drydock, P.O. Box 1852, Houma, LA 70361
Chris-Marine AB, P.O. Box 9025, S-200 39, Malmo, SWEDEN
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Curacao Drydock Inc., P.O. Box 3012, Curacao, Netheriands Antilles
Eastern, 505 North Sam Houston Pkwy. East, Ste. 150A, Houston, TX 77060
European Ship Repair, 120 NE 20th St., Miami, FL 33137
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Galveston Shipbuilding, 6800 Port Industrial Blvd, P.O. Box 2660, Galveston, TX 77553
Gulf Craft, Inc., 3904 Highway 182, Patterson, LA 70392
Halter International, 7412 Lakeshore Drive, New Orleans, LA 70124
Hitachi Zosen, Hitachi Shipbuilding & Engineering Co., 1-1-1 Hitotsubashi, Chiyoda-ku Tokyo 100, JAPAN
Institute for International Research, 437 Madison Ave., N.Y., N.Y. 10022
Jacksonville, Shipyards, 750 E. Bay St., Jacksonville, FL 32202
Jeffboat, Inc., P.O. Box 610, Jeffersonville IN 47130
Kvichak Marine, 615 N 34th St, Seattle, WA 98103
Leevac Shipyards, P.O. Box 1190, HWY 90 East, Jennings, LA 70546
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
MIL Davie, Inc., P.O. Box 130, Levis, Quebec, CANADA
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
Munson Manufacturing, 150 Dayton, Edmonds WA 98020
National Maintenance & Repair Inc., P.O. Box 38, Hartford, IL 62048
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders, 5400 South Cameron Rd., Freeland, WA 98249
Norconsult Engineering Co., Inc., P.O. Box 529, 5785 Plantation Rd., Theodore, AL 36582
Protecno, Ltd., Rua Eugenio Castro, 13A-r/c, 2800 Almada, PORTUGAL, U.S. Rep: Walter Thorsen, Inc., 79 Oweno Rd., P.O. Box 755, Mahwah, NJ 07430-0755
Thomas Marine, 37 Bransford Street, Patchogue, NY 11772
SeaArk, P.O. Box 210, Monticello AR 71655
SeaFab, P.O. Box 1651, 4111 Cedar St. Pascagoula, MS 39567
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381
Skipperliner Shipyards, 621 Park Plaza Dr, Dept 21, LaCrosse WI 54601
Southwest Marine, Foot of Sampson St, San Diego, CA 92113-0308
Steiner Shipyard, Inc., P.O. Box 742, Bayou la Batre, AL 36509
Swath Ocean, 979 G Street, Chula Vista, CA 92011
Textron Marine Systems, 6600 Plaza Drive, New Orieans, LA 70127-2584
Trinity Marine Group, Box 3029, Gulfport, MS 39505-3029
Viking Maritec, 300 Montour Pl., Ste 211, Oakdale, PA 15071
Willard Marine, inc., 1250 N. Grove St., Anaheim, CA 92806
Zidell Marine Corp., 3121 S.W. Moody Street, Portland, OR 97201
Zodiac of North America Inc., Thompson Creek Rd., P.O. Box 400, Stevensville, MD 21666

SHIPYARDS
Balehi Marine Inc., P.O. Box 600, Lacombe, LA 70445

SIMULATOR TRAINING
Houston Marine Training Services, 1600 20th Street, Kenner, LA 70062
Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371

SILENCERS
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

STABILIZERS
Naiad Stabilizers, Van Dusen & Meyer Inc., P.O. Box 558, Shelton, CT 06484

STERN TUBE SEALS
Roland Marine Inc., 90 Broad St., New York, NY 10004

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
Polarmarine, Alvsborgsgatan 37, 72 Gotbenburg, 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
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
Midland Mfg. Corp, PO Box 226, Skokie. IL 60076-0226
MMC International, 60 Inip Dr, Inwood NY 11696
Saab Marine Electronics AB, P.O. Box 13045, S-402 51 Goteborg SWEDEN

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

TOOLS
Ingersoll-Rand, Prof. Tool Group, Allen & Martinsville Rd., Liberty Corner 07938

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FOR MORE INFORMATION

ON

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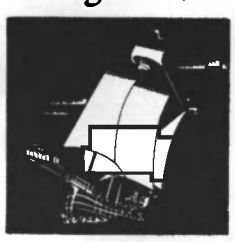

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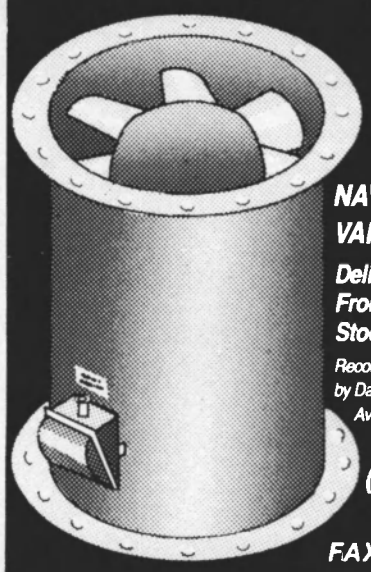

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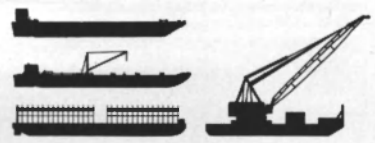

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House Approves Intermodal Container Transport Act

The Intermodal Safe Container Transportation Act of 1992, H.R. 3598, which addresses the problem of overweight containers and trailers in intermodal transportation, was recently approved by the House of Representatives with an amendment.

Rep. **Norman Mineta** (D-Calif.) sponsored the amendment to the bill that makes "minor and technical changes to H.R. 3598 to respond to the suggestions of a broad coalition of shippers, carriers and others involved in the intermodal transportation of containers and trailers."

The Intermodal Safe Container Transportation Act was sponsored by Rep. **Helen Bentley** (R-Md.). If the bill is enacted, H.R. 3598 will make it a requirement for a shipper to provide a carrier involved in intermodal transportation with a written certification of the gross cargo weight and a reasonable description of the contents of the cargo, which must be passed on to each subsequent person in the intermodal chain.

New Service Contract Rules Issued By FMC

The Federal Maritime Commission (FMC) recently voted to issue proposed rules that would allow two or more unaffiliated shippers to negotiate rate discounts, known as service contracts, with ocean carriers.

A rule that guarantees the rights of carrier rate-setting conference members to take independent rate actions without conference restrictions was also finalized by the four-member commission.

The FMC also began a new inquiry to gather data on how carriers deal with shipper's associations and ocean-freight consolidators in negotiating rate discount-agreements.

McGowan Marine Named U.S. Agent For Hytek Gearboxes

McGowan Marine, Inc., of Westport, Mass., has been named the U.S. agent for Siggerud, Norway-based Hytek A/S Ingeniorer. Since 1965, Hytek has manufactured over 1,400 different P.T.O. gearbox configurations and is a well known supplier to industry, offshore facilities, power plants, fishing and supply vessels.

Hytek gearboxes, which can accommodate up to 12 hydraulic pumps, have been installed: to power gear aboard fishing vessels; for driving firefighting pumps on supply ships and platforms; to operate winches and cranes with torques up to 4,700 ft./lbs; and in hydro-electric power plants with capacities up to three megawatts. In-house quality control assurance system meets the requirements of ISO 9001 and the leading classification societies, including: DnV; ABS; and LRS.

Custom gearbox design and manufacture is a specialty at Hytek, with short delivery times available. Gearboxes can include a single, hydraulic clutch for all outputs or individual hydraulic clutches for each output. Parts and services are available to customers worldwide on a 24 hour basis.

To receive additional free information from McGowan Marine about the Hytek line of gearboxes,

Circle 12 on Reader Service Card

USMSA Elects New Officers

The U.S. Marine Safety Association (USMSA) announced the election of its new officers. The officials are: president **David B. Smith**, of SMR Technologies, Uniontown, Ohio; first vice president **Burt W. 'Tom' Thompson**, N.J. Marine Sciences Consortium, Fort Hancock, N.J.; second vice president **James W. O'Connor**, Life Raft & Survival Equipment, Portsmouth, R.I.; and treasurer **Rollie C. Herman**, Westpac Marine Services, Inc., Tacoma, Wash.

The USMSA is comprised of more than 130 companies and individuals involved in the design and/or manufacture of marine safety equipment, the service or sale of safety equipment, or provide training in the use of such equipment. The association is dedicated to promoting the highest possible marine safety standards and creating wide-spread awareness in the use of marine safety equipment. For more information on the USMSA or the 1993 Safety Seminar, contact **Kristina Hagman Goldfield**, USMSA executive director, at (215) 564-3484.

MarAd/MSB Makes Rulings Regarding LNGs

The Maritime Administration (MarAd) and the Maritime Subsidy Board (MSB) have made several rulings regarding the sale and employment of U.S.-operated liquefied natural gas (LNG) carriers.

The sale of the LNG Louisiana and transfer of construction-differential subsidy (CDS) contract obligations from Lachmar Corporation, Inc., to Argent Marine-Louisiana, Inc., was approved by MarAd and the MSB.

Under the terms of the CDS contract, the board also approved the 25-year time charter of the Louisiana to Bonny Gas Transport. The action permits the use of the vessel in foreign-to-foreign trading and stipulates that all seafarers must be U.S. citizens.

At the request of Argent Marine Services, Inc., MarAd has agreed to suspend, for five years, special trading restrictions on the LNGs Arzew and Southern and permit their use in foreign-to-foreign trading.

MarAd said that events beyond Argent's control have made the ship's employment in trade between the U.S. and a foreign country impossible or impracticable. Once again, the agency has emphasized that all seamen onboard both vessels must be U.S. citizens.

Following a request by Cabot LNG Shipping Corporation, MarAd also agreed to permit the use of the LNG Gamma in foreign-to-foreign trading, under the same conditions that apply to the Arzen and Southern.

Lloyd's Classes Largest Ship Built In Rumania

The largest ship ever built in Rumania, the 173,000-dwt Ferosa, has been classed by Lloyd's Register (LR). The bulk carrier was delivered by builders Santierul Naval Constantza SA (SN-SA) to owners Trinity and Taurus, Ltd., who will employ the vessel in exporting iron ore from South Africa.

FEROSA
Equipment List

Main engine	MAN B&W
Auxiliary engines	Sulzer Diesel
Shaft generator	Renk Tacke
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Boilers	Aalborg Ciserv, SN-SA, Meconst
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Hatch covers	MacGregor, SN-SA
Firefighting system	Hamworthy
Lifesaving	Severnav, Turnu Severin
Main radio station	JRC
VHF radio	Raytheon
VHF/UHF portables	NAVTEX

The Ferosa has a length of 978 feet, a breadth of 151 feet and an 80-foot depth. In addition to being constructed to LR's latest bulk carrier Rules, the ship will be fitted with hull monitoring equipment on its arrival in Cape Town. This equipment will provide the vessel's master with a visual indication of actual hull motions and stresses. A recording facility will also be fitted to enable the analysis of collected data. Once fitted with the monitoring and recording equipment, the Ferosa will be assigned LR's SEA (R) notation.

The newbuilding capacity of the Constantza shipyard will be occupied for the next five years by similar sized bulk carriers, which will be built for Trinity and Taurus and Exmar. All of these ships will also be built to LR classification.

President Signs Bill Penalizing Drift Net Users

A bill that mandates trade sanctions on fish products and sport fishing equipment against any country fishing with drift nets in the North Pacific Ocean next year and extending the penalties to the North Atlantic in 1994 was recently signed by President **Bush.**

In the event that the sanctions prove ineffective in stopping drift-net fishing, the President is authorized by the new law to impose additional sanctions on other exports, such as televisions and cars.

The United Nations adopted a resolution last year that bans the use of drift nets on the high seas effective January 1, 1993. The dominant users of drift nets are Japan, Taiwan and South Korea, who use the nets to catch squid in the North Pacific. Opponents of drift net fishing say that the net's indiscriminately kill all marine life in their path.

Regulations were adopted last year by the Administration banning U.S. imports of fish caught with drift nets and placed Taiwan and South Korea on notice that sanctions could be imposed against them if their use of the nets continued.

FMC Proposes To Allow Cruise Operators Self-Insurance

A conditional regulatory change that would allow passenger ship operators to self-insure for indemnifying passengers against non-performance has been proposed by the Federal Maritime Commission (FMC).

To qualify for self-insurance, operators would have to satisfy the following conditions: maintain 110 percent of their unearned passenger revenues (UPR), booking deposits on future sailings, in the form of assets located in the U.S.; file reports on their financial standing to the FMC on a semi-annual basis; and provide evidence of at least five year's operations in the U.S. trades with a satisfactory explanation of any claims for non-performance.

Previously, cruise lines were required to maintain cover equal to at least 110 percent of their highest UPR over the preceding two years, to a maximum of $15 million. The new rules allow a choice of guaranty, escrow arrangement, surety bond, or insurance.

Reportedly, self-insurance was originally withheld pending further study, because the FMC did not have an independent endorsement of the operator's financial risk. Instead, the FMC must base its evaluation on the applicant's own financial assessment.

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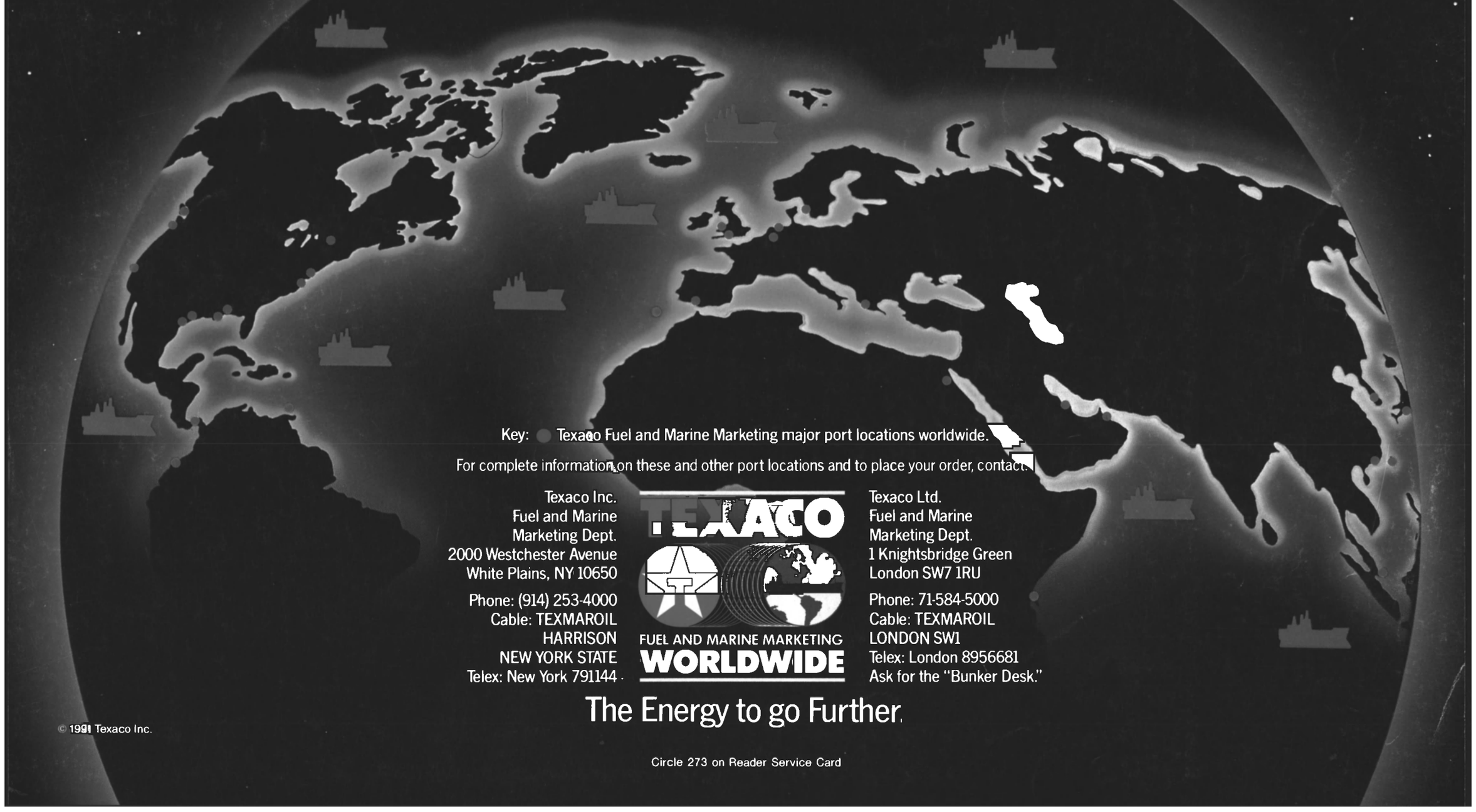

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