

MARITIME REPORTER

AND
ENGINEERING NEWS

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U.S. INLAND WATERWAYS

Focus on U.S. Coastal Shallow Draft Towboat and Barge Industry. The effects of proposed new taxes on Inland Waterways Owners & Operators.

WORLD SHIPBUILDING

Current statistics and forecasts for Worldwide and U.S. Shipbuilding and ship repair.

OFFSHORE DRILLING RIGS

Developments overseas and in the U.S. Gulf of Mexico - Latest Rig Count.

CRUISE VESSEL FLEETS & U.S. CASINO/ RIVERBOATS

Highlights of the most important sector of the cruise industry. Impact of riverboat gaming legislation on U.S. Shipbuilding - Newest Boats and Future Construction.

OCEAN FLEETS

U.S. Flag Oceaangoing Fleets. US Parent Companies of foreign flag ships.

SPECIAL SECTION: U.S. MARINE INDUSTRY GUIDE

Comprehensive statistical guide to the U.S. Marine Industry; detailing the latest ship and boat construction levels. Tables provide current facts on U.S. Inland River Fleets, U.S. Navy Construction, and the latest Maritime Policy changes under the Clinton Administration.

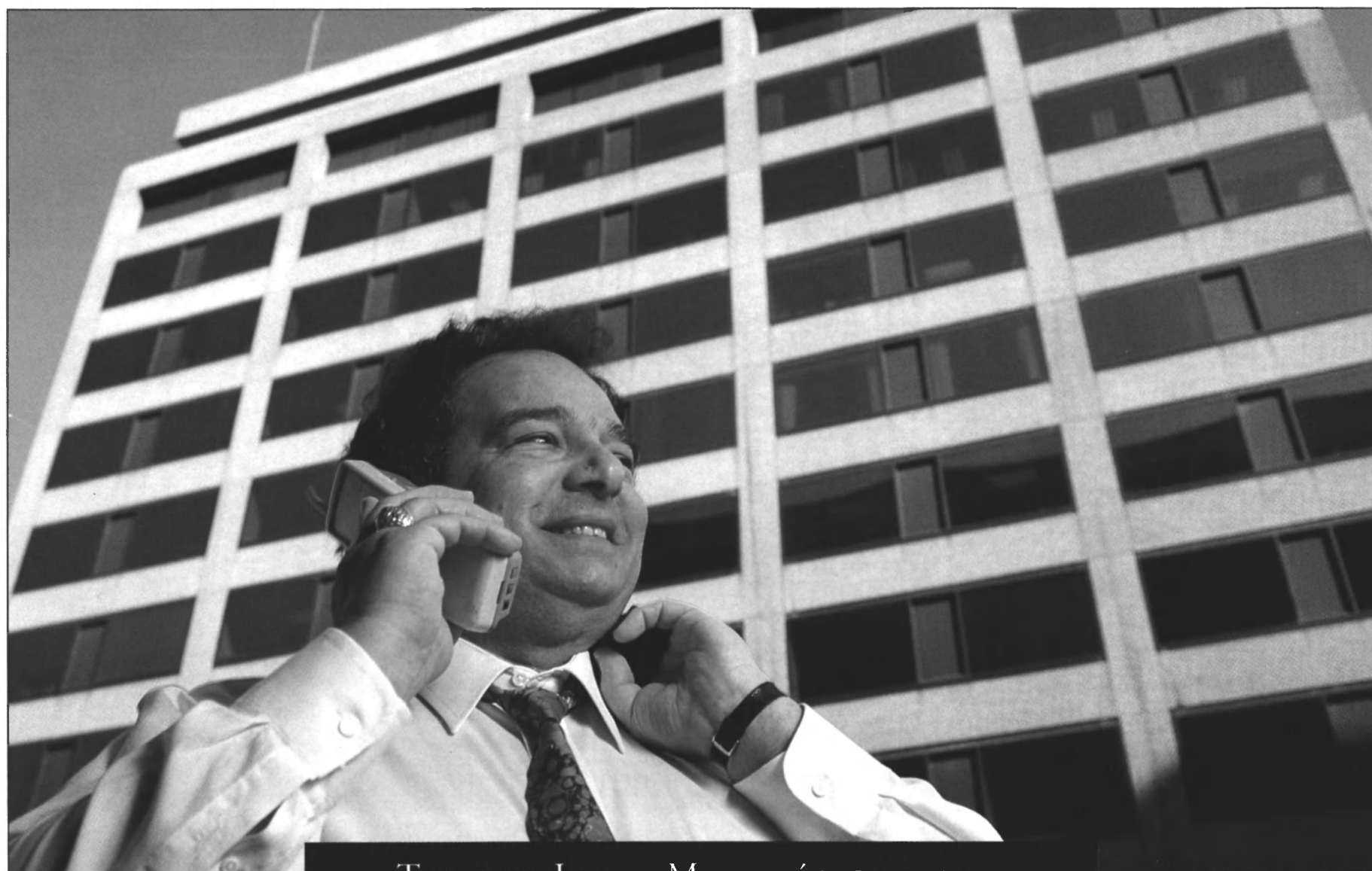


JUNE 19

WORLD MARBOOK



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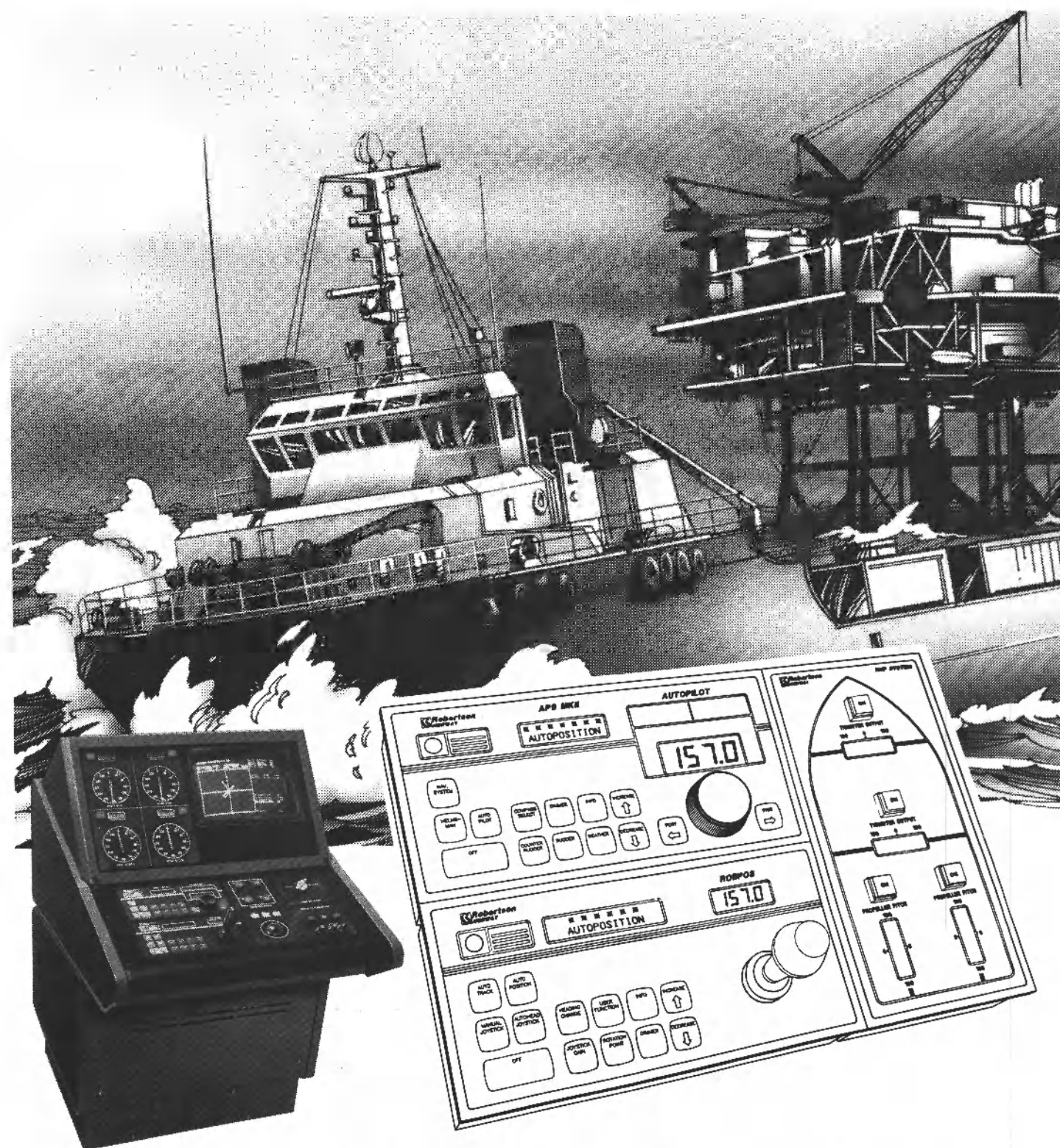
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ON THE COVER

This year's Annual World Yearbook provides vital statistics on all facets of the maritime industry.

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House Proposes \$1.9 Billion Ship Subsidy Plan

The House Merchant Marine & Fisheries Committee recently unveiled a maritime revitalization package which calls for a 10-year, \$1.9-billion subsidy, beginning in fiscal 1996 and covering 90 U.S.-flag vessels. The deal is slightly more than the package the Bush administration sought last year.

MARITIME REPORTER and Engineering News

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

Publishers: CHARLES P. O'MALLEY
JOHN E. O'MALLEY
JOHN C. O'MALLEY

Editorial Director: CHARLES P. O'MALLEY
Managing Editor: GREG TRAUTHWEIN
Assistant Editor: ERIN O'DRISCOLL
Editorial Consultant: JAMES R. McCAUL
Contributing Editor: MARCUS GIBSON
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Regional Sales Manager: DANIEL A. ARNOLD
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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. MR. JAMES N. McCLINTOCK
Gulf States Wheelhouse One Building
634 Village Lane North, Suite 205
Mandeville, LA 70448
Telephone: (504) 893-5099
Telefax: (504) 893-5024

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
Euronmedia 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) 583684
Telefax: (010) 566578
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Germany MR. THEO ANTHONY
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**MARITIME
REPORTER**
AND
ENGINEERING NEWS

ISSN-0025-3448
No. 6 Volume 55

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

ESTABLISHED 1939

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

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

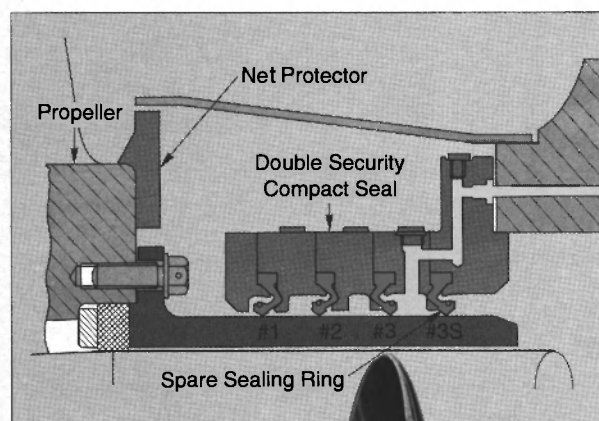
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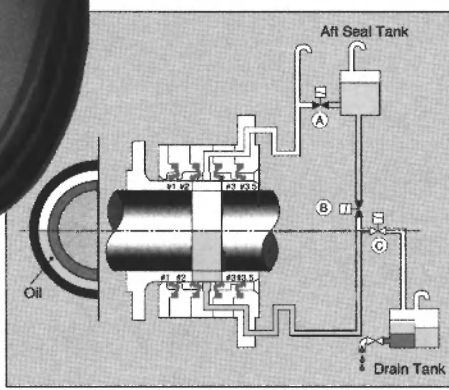
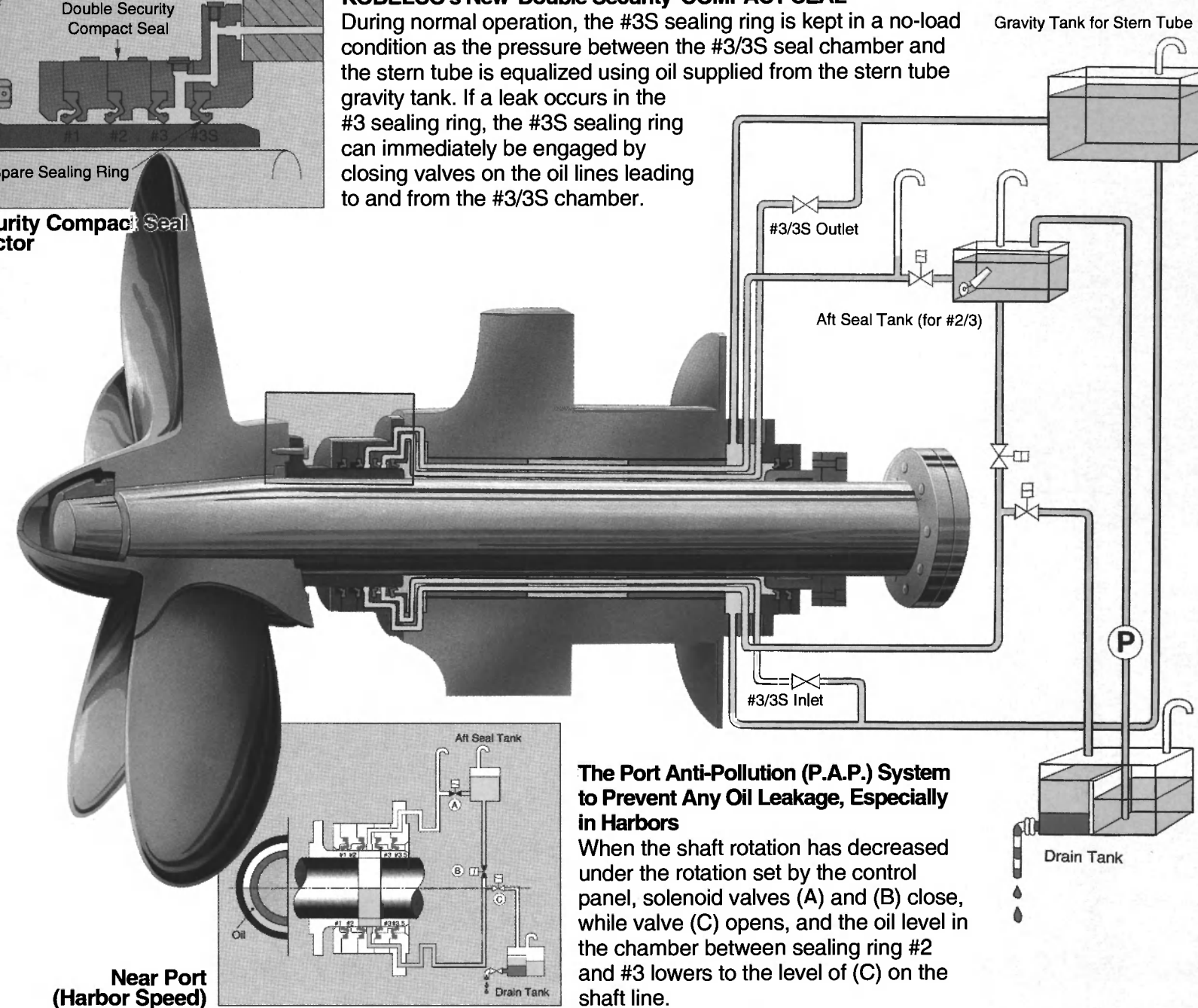
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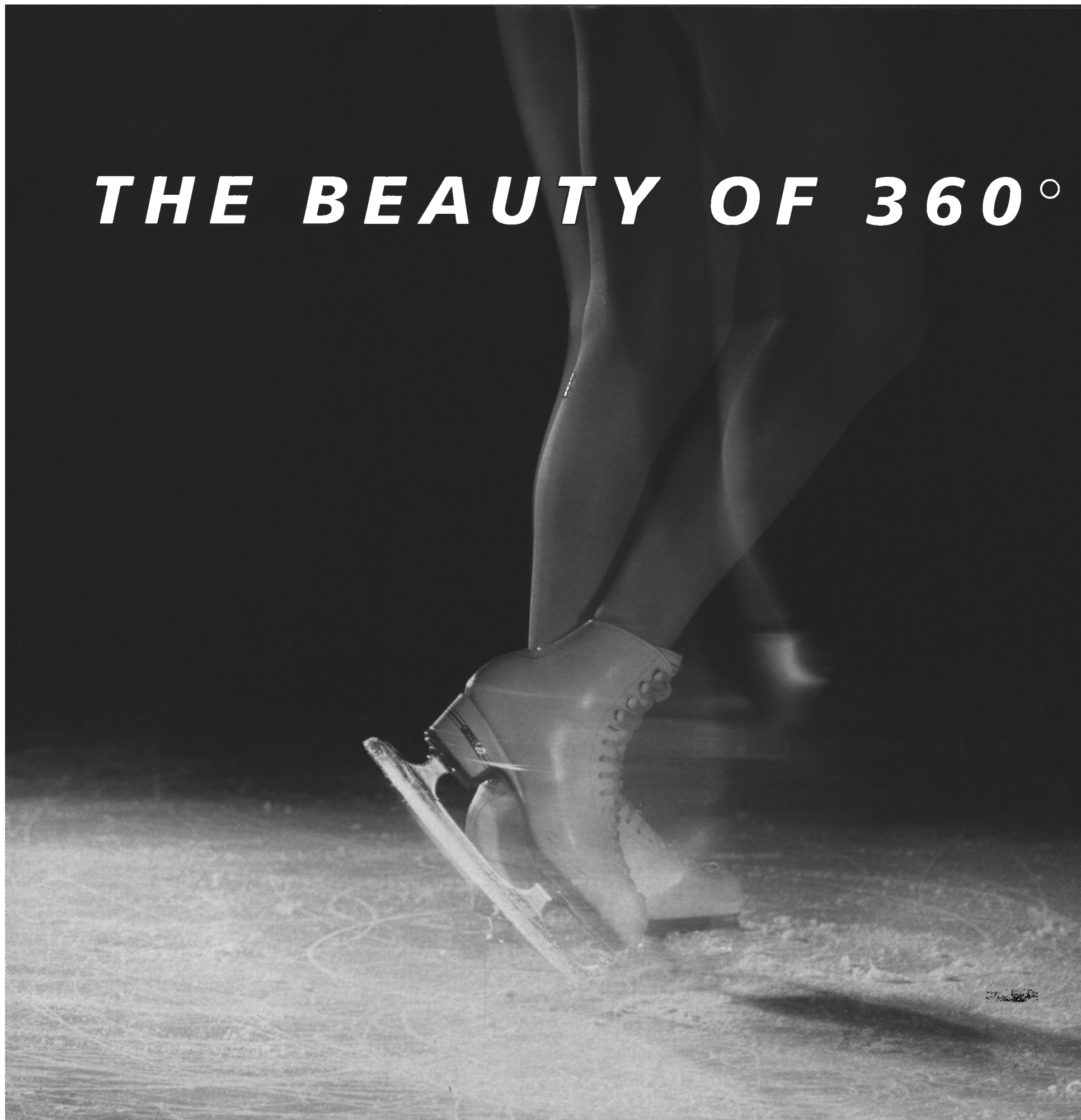
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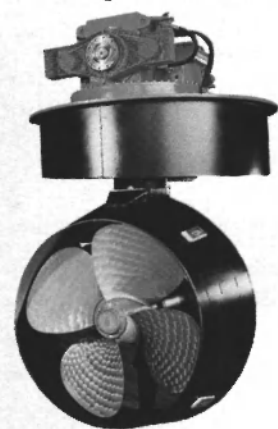
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Volvo Penta Chosen To Power Italian Coastguard Vessels

The Italian Corpo delle Capitanerie di Porto (Coastguard) has now taken delivery of six new rigid inflatable fast patrol boats, each of which is powered by a pair of Volvo Penta TAMD 71B diesel engines. The engines are rated for Special Light Duty use and each produces 380 hp at 2,600 rpm, drive being via a Hamilton 291 water jet, to give a top speed of more than 33 knots.

The boats are of the Dutch "Valentijn" type, a 35-foot long design suitable for launching and recovery over an open beach and incorporating an aluminium hull with a surrounding inflatable rubber ring and a covered wheelhouse arrangement.

The design was produced by the Willem de Vries Lentsch bureau in Holland for the Dutch Lifeboat Institute, while the Italian versions have been built by Codecasa Due, of Viareggio, which has acquired a license for the design. The Dutch prototype, also Volvo Penta powered, was completed in 1990 by Damen Shipyards and was followed by a number of production examples, all similarly engined.

The six new Italian craft were delivered between the Autumn of 1992 and the Spring of 1993, and have already demonstrated excellent performance in service, proving fast and safe with good seakeeping qualities.

For more information on the Volvo Penta diesel engines,

Circle 20 on Reader Service Card

MacGregor-Navire Introduces Omega Seal For Hatch Covers

One of MacGregor-Navire's latest developments is a pneumatically-actuated, simply-operated, retractable sealing system for the transverse and longitudinal cross joints of lift away hatch covers enabling them to be lifted in any order. Previous types of cross joint seals often involved the hatch cover panels being lifted in a specific order, thus restricting the flexibility of cargo handling operations.

The new system, known as the Omega Seal after the Greek letters its cross section resembles, is intended for fitting to newbuildings, but may also be retrofitted to certain existing lift away hatch cover panels.

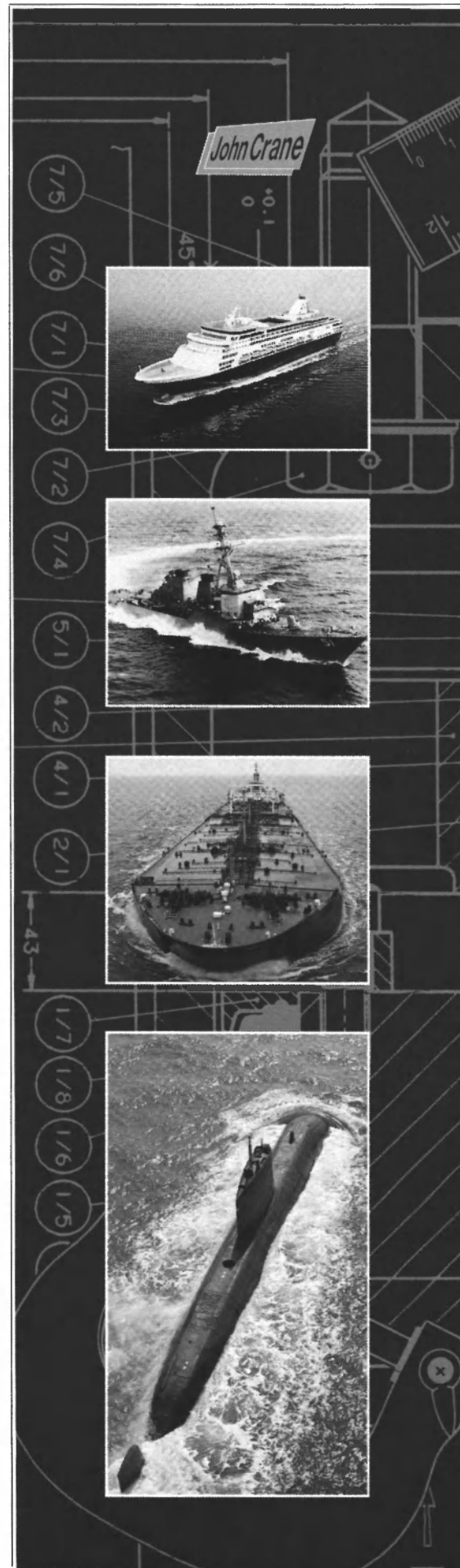
An increasing number of vessels, particularly containerships, are now being equipped with the Omega Seal which reportedly offers several advantages when compared with the traditional method of mechanically tightening the seal system. To date, orders have been received for more than 120 joints on over 20 ships.

A feature of the Omega Seal is

that it employs no mechanical components but uses the natural elasticity of the rubber to provide the seal contact between the hatch cover panels. When the hatch covers are to be removed, compressed air is used to alter the profile of the seal, causing it to retract and enabling the panels to be lifted.

For more information regarding MacGregor-Navire's Omega Seal,

Circle 21 on Reader Service Card



Legislation Hopes To Compel Revitalization Of Nation's Marine Business

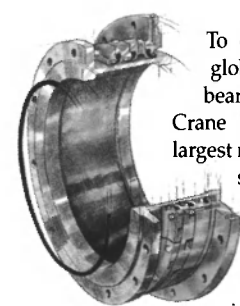
Recently-passed legislation requires Secretary of Transportation Federico Pena to draft a five-year plan for revitalizing the merchant marine business.

The bill will require the Administration to take a long-range view of the shipping industry's economic

and industrial problems that some feel have been ignored.

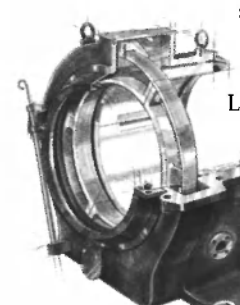
Improvement of U.S. maritime capabilities will require a myriad of changes, including substantial commitment of resources from the government, and Pena has been a staunch supporter of tough trade sanctions against massive government subsidies to foreign shipbuilding and ship repair facilities that may have contributed to the decline of the U.S. shipbuilding business.

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BOATS AND BARGES

Impact 21': Boston Whaler's New Soft-Sided Workboat

The Commercial Products Div. of Boston Whaler, Inc., the Rockland, Mass.-based company, announced the production of its first-ever soft-sided workboat. The Impact 21' is a new outboard-powered workboat combining an unsinkable Boston Whaler fiberglass hull with a full-fitted, molded foam collar. The result: a soft-sided workboat with a tough, heavy-duty fendering system which gives full-time, bow-to-stern protection against rips, punctures and abuse.

Boston Whaler designed the new vessel to answer its customer's need for a soft-sided workboat that facilitates boarding abilities to other craft but would not mar the sides of other vessels when coming alongside. The Impact 21' is highly maneuverable and designed for any job which involves working off the sides of a ship. To accommodate the new fendering system, design changes produced the unique soft-sided workboat. According to the manufacturer, early models of the Impact 21' will be center console boats designed and suited for harbor patrol, law enforcement, search and rescue missions, environmental monitoring and emergency response duties. The foam fendering system not only provides full time protection, it also

reportedly makes the Impact 21' an excellent boom boat for oil recovery operations.

The Impact 21 is practically maintenance free, as its fendering system can reportedly be ripped, torn, slashed and stabbed without ever deflating, which means the vessel can stay in service longer. The vessel also supplies ample deck/storage space and incorporates plenty of hard deck areas for mounting hardware and accessory items. Cleats and chocks and other gear are fastened mechanically to the hull, not bonded to the collar.

The standard equipment on the boat includes: an unsinkable deep "V" hull; haze gray gelcoat hull; removable five-section foam collar fendering system; heavy duty leaning post with storage shelf and lockable doors; hydraulic steering and stainless steel wheel; below deck 60-gallon aluminum fuel tank; a limited 10-year hull warranty and much more. Additionally, the vessel can be fitted with the same commercial accessories available on any Boston Whaler Guardian class workboat. This includes navigation and safety equipment, spotlights and more. Owners can specify towing equipment and outboard crash rails and choose from a large selection of com-



Boston Whaler's new Impact 21'.

pact, all-weather VHF-FM marine radios, loran, recording and digital depthsounders, radar and hailer/fog horn equipment. The 21-foot boat has a beam of 8.25 feet and a draft of 14 inches; capacity for 11

people; a maximum capacity with engine and fuel of 5,100 pounds; and a maximum horsepower of 200. For more information on the Impact 21',

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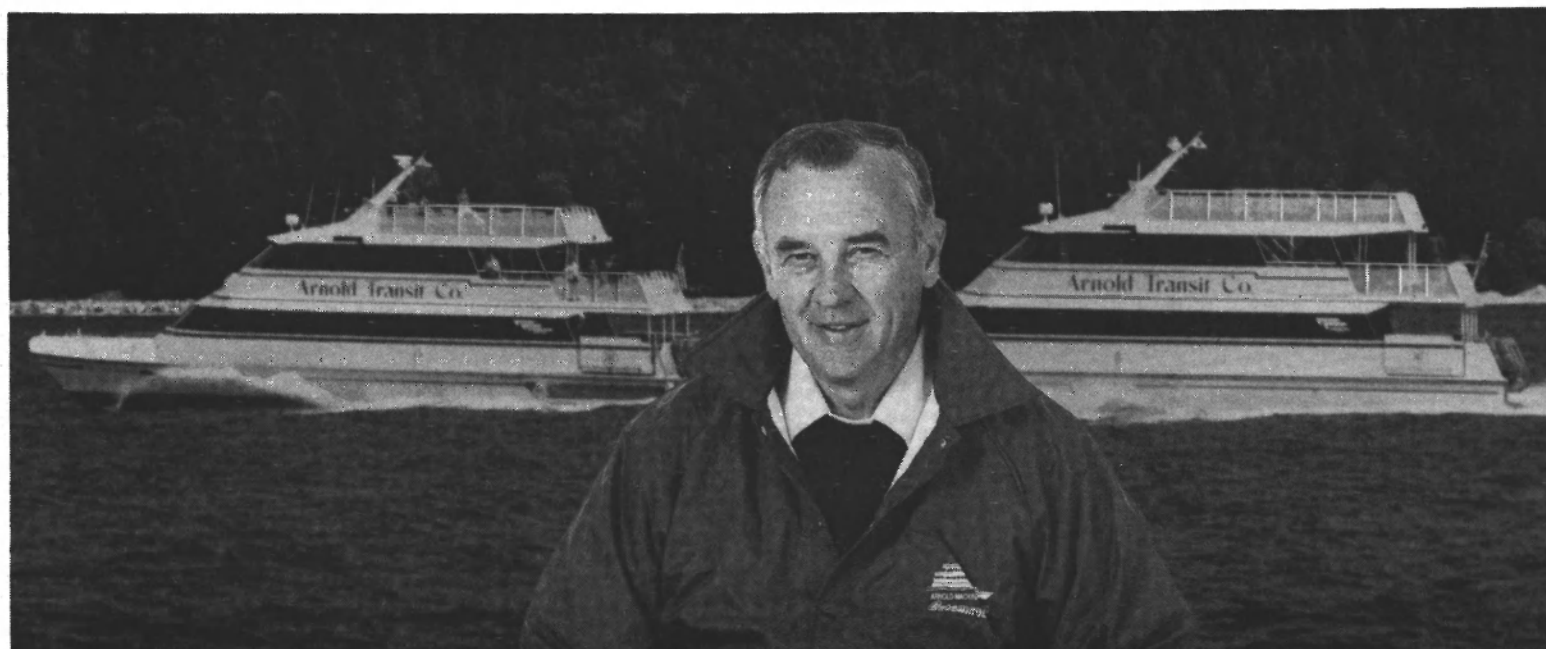
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Circle 32 on Reader Service Card

PROPULSION UPDATE

MAN B&W Releases Latest On Its Ecologically-Sound 32/40 Engine

By Marcus Gibson, contributing editor

Noted for the reliability of its full range of large medium-speed engines, MAN B&W, at a recent conference in Augsburg, revealed the results of the testbed program of its newly-developed mid-sized engine, the 6L 32/40.

Particular attention during the test program was paid to the running and wear conditions of pistons, piston rings, cylinder liners, valves, main and connecting rod bearings.

MAN engineers claim the 32/40 range meets the growing demand for reliable and flexible operation while, in addition, it introduces novel features to ensure compliance with some of the toughest global emission standards.

MAN's sales manager for marine engines, Uwe Viets, said, "The 32/40 engine covers a hefty section, some 43 percent, of MAN's power range. The power plant is intended as auxiliary plants for the new generation of 3,000- to 4,000-teu container ships, or as the main propulsion for smaller vessels."

In providing private shipowners with a solid workhorse, MAN has sold approximately 65 large engines each year and 150 smaller units for the past few years.

Looking for an upswing in building by 1995, the company's market strategy entails offering ultra-reliability to the shipowner in return

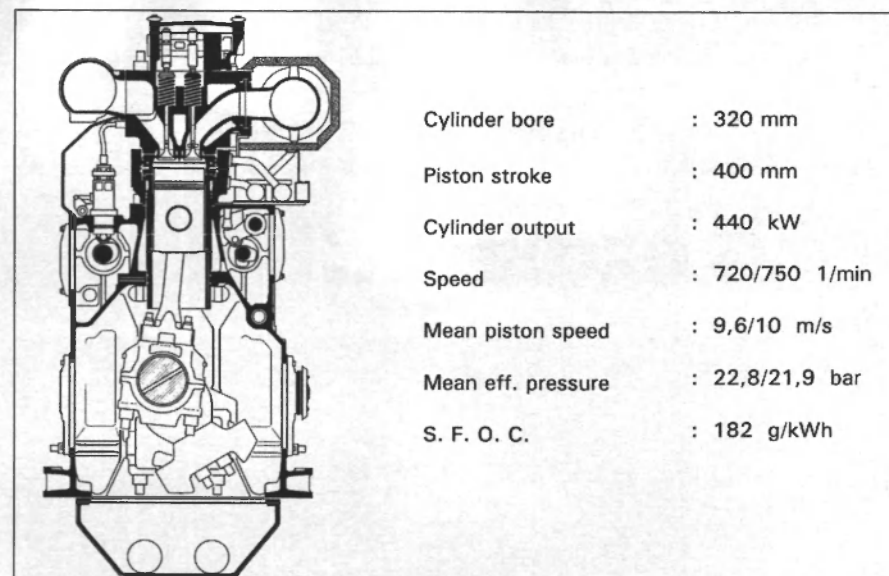
for "best prices" for its engines. While company officials would not discuss the price range for the 32/40 engine, they would admit that volume sales are a key to its success.

With a cylinder bore of 320 mm and a piston stroke of 400 mm, the 32/40 engine produces 440 kW per cylinder at 720 to 750 rpm and a maximum pressure of 180 bar, while consuming fuel at only 179 g/kWh and lube oil at 1 g/kWh.

Above all, a high degree of flexibility has been built into the engine to meet stringent environmental regulations, making the 32/40 a large-bore diesel engine developed with due allowance made for ecological aspects.

The 32/40's "extra performance" emerges from a variety of extra features designed into the basic engine design, which have successfully delivered low fuel and lube oil consumption, unrestricted heavy fuel oil compatibility and extended wear rates.

Based on the sturdy, one-piece frames of the large-bore range, which have logged around 1.7 million operating hours, the 32/40 is the first to be fitted with twin camshafts. The installation of a second camshaft allows injection timing and engine timing to be operated independently. Fitted directly opposite each other, the 32/40 has one camshaft serving the fuel injection pumps and air pilot



Cylinder bore	: 320 mm
Piston stroke	: 400 mm
Cylinder output	: 440 kW
Speed	: 720/750 1/min
Mean piston speed	: 9,6/10 m/s
Mean eff. pressure	: 22,8/21,9 bar
S. F. O. C.	: 182 g/kWh

valves, while the second governs the inlet and exhaust valves.

This separate camshaft solution provides a method of lowering NO_x emissions over the entire load range as an alternative to an SCR catalyst. During the Augsburg testbed demonstration, when the firing pressure was adjusted, NO_x emission readings dipped quickly from 5 g/m to just below 4 g/m.

As the IMO is considering a cut in emissions by sea-going vessels of 30 percent by the year 2000, and the possibility of lower limits introduced by Germany's TA-Luft regulations and the California Air Resources Board (CARB), MAN hopes the NO_x-reducing facility of the 32/40 will make it a volume bestseller among shipowners.

Additionally, MAN engineers claim the engine can be outfitted with additional equipment—including fuel/water emulsion treating and exhaust gas recirculation system, and an NH injection unit—to meet

future CARB emission limits.

To reduce NO_x emissions still further without extra wear on the engine and excessive fuel consumption, MAN's technical expert Dr. Lausch said that the secret lay in new materials technology, which he estimated might appear in five to six years.

The 32/40 range has also been fitted with new chromium-ceramic coated piston rings to reduce wear. The new technology, started five years ago with funding from the German ministry of technology, has been co-developed by MAN.

An innovative design of the cylinder head, with its composite piston and nodular cast iron skirt, has been fitted to reduce temperatures on the crown and sharply reduce long-term wear and tear.

For more information on the MAN B&W 32/40 engine,

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Matrix Technologies Signs \$1.7 Million Deal To Supply Navigation Systems

Matrix Technologies Inc. has entered into a \$1.7 million contract to supply electronic chart systems to a Singapore firm.

Under the terms of the three year contract, Matrix will export its Infonav™ Marine Navigation System to Innovtech Systems, Pte., of Singapore, commencing in August 1993.

Innovtech is a specialist company in the marketing and distribution of high tech instrumentation in the Asia Pacific countries. Innovtech Systems, a member of the Innovtech Group, has a dealer distribution network located throughout the Association of South East Asian Nations (ASEAN) and the Asia Pacific.

Infonav is an electronic chart system for marine navigation. The system integrates navigational data from a wide variety of sources and displays. The system operates on a personal computer ruggedized for the marine environment.

Infonav uses information from the Global Positioning System (GPS) satellite network to display a real time vessel position which is overlaid on a full color electronic nautical chart. The system allows the navigator to perform many other navigational tasks such as planning & monitoring of waypoints, routes, and courses, hazard avoidance, target tracking and man overboard.

The system can also accommodate inputs from other navigation receivers such as DGPS or Loran, as well as sensors such as gyros, compasses and speed logs. Through use of an interactive and graphical format, various "windows" allow multiple information displays to be called up as the navigator requires.

Karl Kenny, Chief Executive Officer of Matrix Technologies said, "We are extremely pleased to enter into this contract with Innovtech. Infonav represents over 10 person years of development effort. For the past six months we have been working closely with Innovtech to finalize the product for this market."

For more information on Matrix,

Circle 15 on Reader Service Card

ABB Marine Thruster Drives And Power Plant For Two Cable Ships

ABB Marine, Helsinki, has signed a contract with Kvaerner Masa-Yards, Finland, for the delivery of the electrical thruster drives and power plant for the two dynamically positioned cable vessels under construction at the Turku New Shipyard for International Cables Pte. Ltd. of Singapore. The first ship will be delivered in the autumn of 1994 and stationed in Singapore. The second vessel, to be delivered in 1997, will be stationed in Manila.

This new type of cable vessel,

with an overall length of 394 feet, has been developed especially to serve the growing fiber optic submarine cable networks in South East Asia and the Indian Ocean. Both vessels will feature a new stern working concept for enhanced operational performance and response. A full dynamic positioning (DP) system will also be installed.

Each of the propulsion and thruster motors is speed-controlled by a Sami PWM AC frequency converter. Speed control of the thrust-

ers offers a better overall economy and dynamic performance than conventional pitch control.

When applied to propulsion and thrusters for DP operation, the PWM (pulse width modulated) drives provide immediate availability and soft start of the thruster motors, excellent maneuvering performance with rapid response and a minimum of mechanical wear and cavitation at low thrust. Sami PWM thruster and main propulsion drives are currently being installed on a DP sur-

vey vessel being built by Mjellem & Karlsen in Norway for Aramco of Saudi Arabia, and a motor yacht under construction in Holland.

ABB Marine is the leading supplier of AC (alternating current) propulsion systems. Cyclo propulsion plants are currently in operation in, or under delivery to, ten cruise vessels, six icebreakers and three tankers. For more information on ABB Marine,

Circle 23 on Reader Service Card

Paint Underwater with Epoxy

Some have been keeping the information secret; others cannot believe it. If you maintain a stationary or mobile marine structure, you can easily repair and coat steel or concrete surfaces underwater using one of the HYCOTE™ underwater paints, fairing compounds or adhesives. It's true.

For years, offshore platform and jetty owners have struggled to apply epoxy putty-like compounds to steel and concrete surfaces. Adherence problems and application challenges often turned the project into an economic and engineering disaster. In 1984, an Australian company promoted HYCOTE™ 151, a thin, durable epoxy coating engineered for underwater application. Hundreds of marine structures have been coated with HYCOTE™ since then, with outstanding results.

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epoxy can provide. Some customers have found that HYCOTE™ is the only coating which withstands the unusual abrasion given to rudders and stabilizing fins.

One coat application, 100% solids (no VOC's).

If it works well underwater, think of where condensation or continuous washing prevents the application and adherence of your traditional epoxy system - e.g. operating machinery, storage tanks, fish processing decks, bilge areas

We've got the Americas covered. In fact, if you maintain a U.S. Government owned ship, we've got the world covered! For technical assistance and the names of licensed suppliers of the HYCOTE™ family of paints, fairing compounds, and adhesives, call or fax David Allan, Vice-President at: **1 (902) 422-1219.**

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Supplier inquiries from established paint companies welcome.

Circle 347 on Reader Service Card

Kvaerner Fjellstrand Wins Chinese Order For 131-Foot Flying Cat

A 131-foot Flying Cat passenger catamaran worth \$6 million has been ordered by Yantai Marine Shipping Company of China from Kvaerner Fjellstrand, part of Norway's Kvaerner group.

To be built at Omastrand in western Norway, this is the ninth 131-

foot Flying Cat ordered from the group's high-speed vessel yards in Norway and Singapore over the past nine months.

"The market for our passenger catamarans is starting to pick up," says president **Anders Jordal** at Kvaerner Fjellstrand in Omastrand.

The Chinese company, which is located in the northern port of Yantai, opted for the Kvaerner Fjellstrand vessel reportedly because of its high quality and good seakeeping. This craft will be

equipped with Kvaerner's recently-developed MDS motion damping system, which, to date, has been installed on seven catamarans and reportedly greatly improves passenger comfort in heavy seas.

Yantai Marine Shipping will take delivery of the catamaran in May, and plans to operate it between Yantai and Dalian. Able to carry 300 passengers, the vessel will be equipped with two MTU diesel engines and KaMeWa water jets to give a service speed of 34 knots.

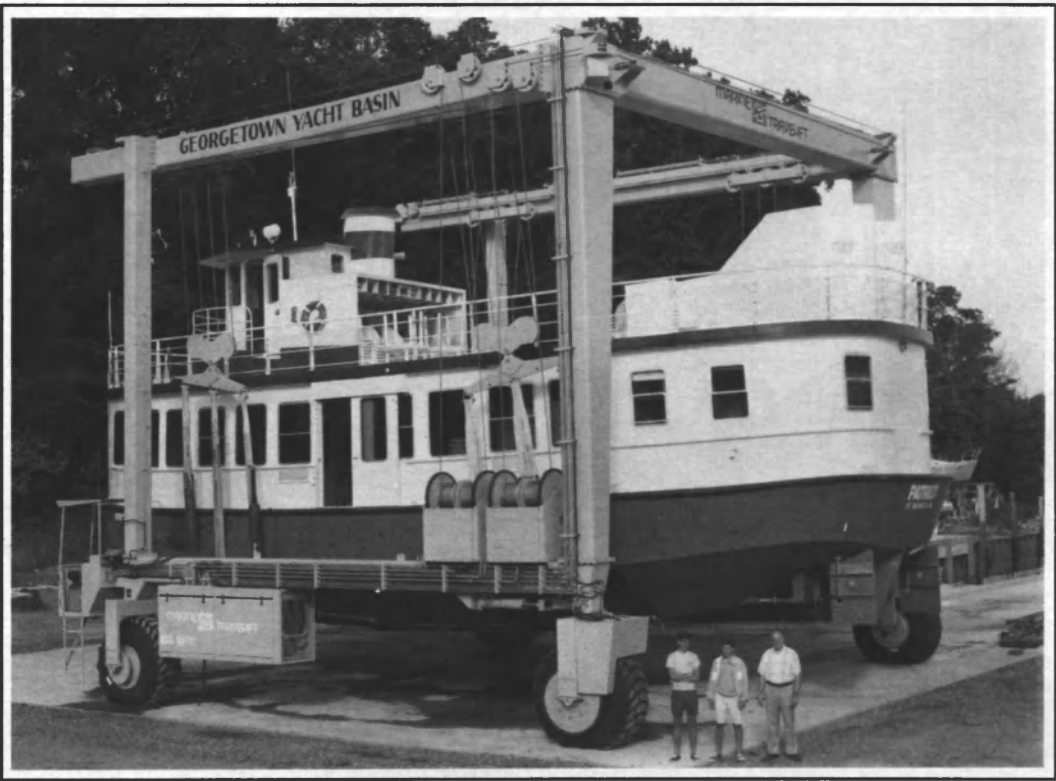
For more information on Kvaerner Fjellstrand,

Circle 39 on Reader Service Card

131-Foot Flying Cat Equipment List

Main engines	MTU
Reduction gears	ZF
Water Jets	KaMeWa
Ventilation	Novenco

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SOLUTION: OMNIPURE



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SOLUTION: OMNIPURE



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PROBLEM: adverse operating conditions; NATO compatibility; exacting design criteria.

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Maritime Reporter/Engineering News

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Circle 246 on Reader Service Card

Russia's Reversible Marine Gas Turbine-A Step Forward

According to **Victor Romanov**, an engineer with Russia's Mashproekt Scientific and Production Association, Nikolayev, Ukraine, Russia has developed the world's only reversible gas turbines for marine applications. These units provide a high degree of maneuverability for ships in a relatively com-

pact system.

Mr. **Romanov** noted that the reversible gas turbine is not Russia's first innovation in the field. In fact, Russia reportedly developed the world's first gas turbine unit for marine application in the 1950's. As a result of Cold War tensions thawing, many of Russia's various technical programs have come to light, including the reversible gas turbine. Mr. **Romanov** presented a history of Mashproekt's success with ma-

rine gas turbines at the American Society of Mechanical Engineers' (ASME) 38th International Gas Turbine and Aeroengine Congress and Exposition, held May 24-27 in Cincinnati. ASME is a Washington, D.C.-based association.

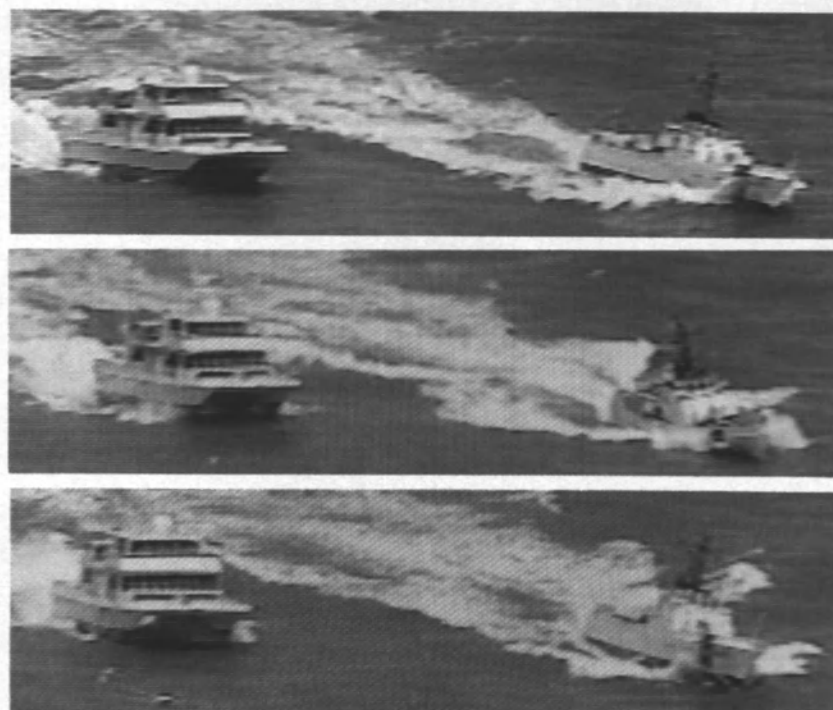
Mashproekt's reversing turbine system utilizes and improves the advanced technology of many of its earlier models. Normally, a reversing mechanism utilizes reduction gears using friction or hydraulic cou-

plings. In the Russian unit, however, the free power turbine has two-circle blading. The guide vanes and rotor blades for reversing are located in the upper circle. For a vessel to reverse direction, its operating power must be slightly reduced. Then gas blow-off from the inner circle to the outer circle (for reversing) occurs, taking only five seconds. Thus, a few seconds after the command is given to reverse, astern (reverse) torque starts to operate in the ship shaft line, providing rapid deceleration of the ship.

However, the system is not without drawbacks. Power output for reverse is only 20 percent of that of forward. Additionally, power loss for forward movement is reduced by about five percent making the mechanism reversible.



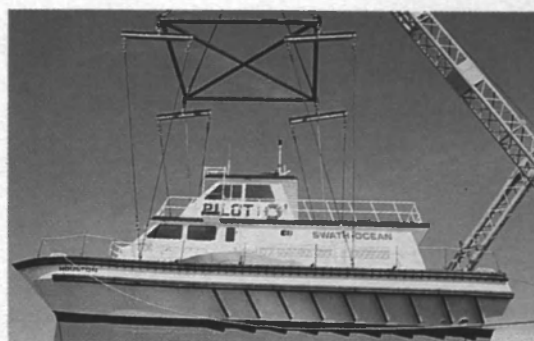
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Speed: 20 knots

Sequence of VHS footage taken during sea trials off San Francisco Harbor entrance.
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Kvaerner Rosenberg Awarded \$85 Million Offshore Order

Kvaerner Rosenberg AS, a unit of Kvaerner AS, was awarded an \$85 million contract by Norsk Hydro AS, an active Norwegian oil producer.

The contract is for the fabrication of a 9,000-metric-ton module support frame for the Troll oil field platform in the North Sea, about 62 miles off the coast of Norway. The project is expected to be the largest subsea development on the Norwegian continental shelf to date.

The module support frame will be delivered in the spring of 1995 and connected to the platform's substructure. Production at the Troll oil field is planned to begin in January 1996.

Statoil Awards \$353 Million In North Sea Contracts

Statoil, a Norwegian state-owned oil and gas company, awarded three major contracts totalling \$353 million for detailed engineering and drilling related to the Sleipner West development in the Norwegian sector of the North Sea.

The largest share of the contracts, worth approximately \$181 million, was awarded to Smedvig A/S for the drilling of 18 wells, with an option for six additional wells.

Kvaerner Engineering's share of the contract is valued at approximately \$151 million. Kvaerner will have overall responsibility for verification of the complete offshore development's order, and will also be expected to detail engineering, procurement and construction site follow-up for the Sleipner gas treatment platform.

The last contract, worth approximately \$19 million, was awarded to Norwegian Rig Consultants for detailed engineering of the Sleipner B wellhead platform, including procurement and construction follow-up.

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Circle 276 on Reader Service Card

Glostten Associates To Design New Arctic Research Vessel

The Glostten Associates Inc., a Seattle-based naval architecture and marine engineering firm, has been contracted by the University of Alaska—Fairbanks and the National Science Foundation (NSF) Directorate for Geosciences to prepare a preliminary design for a 343-foot arctic research vessel. The new vessel will serve as a national re-

source dedicated to extending the U.S.'s ability to conduct research in the Arctic Ocean.

According to naval architect **Dirk H. Kristensen** of The Glostten Associates, the new vessel will be a "multidisciplinary research platform featuring the latest in high-tech, ice-breaking hull design. Conceptual design studies estimate a total installed propulsion power of approximately 18,000 hp.

Conceptual design will be for a 343-foot vessel with an 84-foot beam,

able to comfortably accommodate up to 36 scientists and a crew of 26. The vessel will have a 1,970-sq.-ft. covered staging bay and two covered "Baltic" rooms which will provide direct access to the ship's side for instrument deployment. The vessel will also have 9,860-sq.-ft. of exterior working decks, and a helicopter landing pad will accommodate a Jayhawk H60J search and rescue helicopter. The initial timeline calls for construction to begin in 1995, with a delivery date for 1996-97.

The Glostten Associates collaborated on the hull form with the Hamburgische Schiffbau Versuchsanstalt (HSVA) of Hamburg, Germany, and AKAC, Inc. of Calgary, Alberta will assist with ice-related hull and propulsion issues. For more information on the new vessel from The Glostten Associates

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Circle 153 on Reader Service Card

Trinity Delivers Double Hull Petroleum Barge To Bouchard Transportation Co.



Trinity Industries' Double Hull Petroleum Barge

The largest double hull barge on the West Coast meeting and exceeding (OPA '90) requirements has been delivered by Gretna Machine & Iron Works, Inc., a subsidiary of Trinity Industries, Inc., to Bouchard Transportation Co., Hicksville, N.Y.

The Bouchard No. 230 is 467 feet long, with an 80-foot beam, a 36-foot depth, and a fully loaded draft of 26 feet.

The B. No. 230 is chartered to Mobil Shipping Co., Fairfax, Va., for transportation of crude oil on the West Coast. It will be based out of Los Angeles, Calif., along with the tug Ralph E. Bouchard, a 127-foot, 6,140 hp raised pilot house tug.

B. No. 230 is equipped with 16 cargo tanks, for a carrying capacity of 19,680 long tons, a 12 million BTU Va-Power Thermal Fluid Heater, a Permea Inert Gas System and a segregated ballast system to be transferred by two diesel driven deepwell pumps carried between the double hull. On deck, the B. No. 230 is equipped with a separate pollution staging warehouse equipped with emergency booms, two 10-ton capacity Appleton cargo hose handling cranes, four New England Trawler wire rope mooring winches, and one dual anchor New England Trawler windlass.

Yim Sworn In As Deputy Maritime Administrator

Joan Yim was sworn in as deputy administrator of the Maritime Administration by Secretary of Transportation **Federico Pena**. Mr. **Pena** said Ms. **Yim** has a broad experience in policy analysis, interagency coordination and government affairs. She was a supervising planner with the Honolulu office of Parsons, Brinckerhoff, Quade & Douglass.

Maritime Reporter/Engineering News

RTK Marine U.K. Gets Contract For Pollution Control Workboat



RTK Marine's Sea Truck Workboat

RTK Marine received an order from the Port of London Authority for one of its 512 Sea Truck Workboats.

The 41.5-foot Sea Truck will be able to respond rapidly to an oil pollution incident on the River Thames and act as a first line of defense to deploy a range of oil containment and recovery equipment.

Propulsion is by twin Volvo Penta diesel engines complete with outdrive units. This craft will be capable of beaching to land equipment which will assist clean-up operations ashore.

A unique feature of the Sea Truck is the built in bow ramp to facilitate deployment of pollution control equipment either afloat or ashore.

RTK Marine has been constructing Sea Trucks for more than 25 years.

To date, more than 1,100 boats from 16-feet to 52-feet have been constructed at their Poole, England factory.

For more information on RTK Marine,

Circle 4 on Reader Service Card

Comsat Brings Teleconferencing To Sea

The Radisson Diamond became the first cruise ship in the world to hold a live two-way satellite video conference between ship and shore. The event was conducted by Comsat Mobile Communications as part of a press demonstration to show how advanced shipboard communications have become.

The videoteleconference was held between the Radisson Diamond, during a five day tour of the Caribbean, and Comsat Mobile Communications' Washington, D.C. headquarters.

"We chose the Radisson Diamond for this first time event because of the ship's unique business service center and focus on business meetings and incentive travel," said **John R. O'Brien**, vice president of marketing and program management for Comsat Maritime Services. "Business people have traditionally shied away from business meetings on cruise ships in large part because of the perception that there are very limited communications capabilities

on board," Mr. O'Brien said.

"We wanted to show that the old perception is no longer valid. This ship has some of the most sophisticated mobile communications equipment in the world on board, and we decided to connect it to a brand new technology using high speed data (56 kbps).

This allows the communications capabilities to move up by an order of magnitude, including broadcast quality audio and two-way digitally compressed video conferencing."

The service has just recently become possible for ships because of a new high speed data modem and interface device developed by Magnavox Electronic Systems Company that permits the ship's Inmarsat satellite system (Satcom) to provide a two-way, or "duplex" service, allowing interactive conversations and simultaneous video.

Another unique feature of the Comsat service is that it is "demand assigned," meaning that anyone with the proper equipment can simply "dial up" the video conference connection. Special satellite transponder leases and the complicated coordination procedures associated with typical video conferences are not necessary.

This makes the service ideal for last minute meetings, emergency medical consultations with shore-based hospitals, and for research vessels and off-shore oil platforms needing to share timely information with shore.

Comsat Mobile Communications, a division of Comsat Corporation

provides maritime, aeronautical and international land mobile services to customers around the world.

For more information on Comsat Mobile Communications,

Circle 35 on Reader Service Card

Bally Gaming Opens New Riverboat Sales Office In Biloxi, Miss.

Doug Sanderson, Director of National Casino Sales for Bally Gaming, Inc., announced the opening of the company's new office in Biloxi, Miss.

This satellite office will focus on sales and service of gaming equipment for the expanding riverboat gaming market. It is headed by **Don Boone**, the company's new General Manager of Riverboat Gaming Sales.

A twenty-year veteran of the hotel and casino industry, Mr. Boone spent the last three years as Sales Distribution Coordinator at Bally Gaming, Inc. in Las Vegas. He may be contacted in Biloxi at (601) 374-7700 regarding riverboat gaming.

Bally Gaming, Inc., is a Las Vegas-based leading designer and manufacturer of reel-spinning slot machines, video gaming equipment, and video lottery terminals.

For more information on Bally Gaming,

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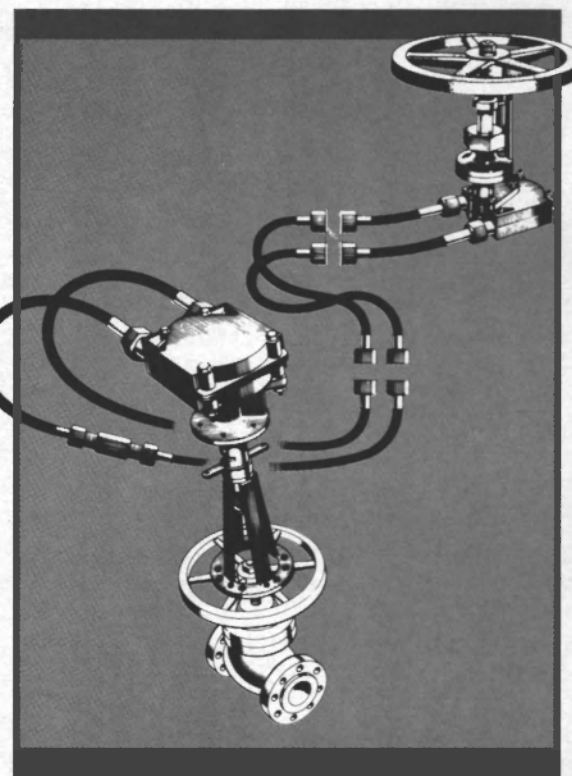
Circle 211 on Reader Service Card

For remote valve operation...

Nobody's Remotely Close To Teleflex

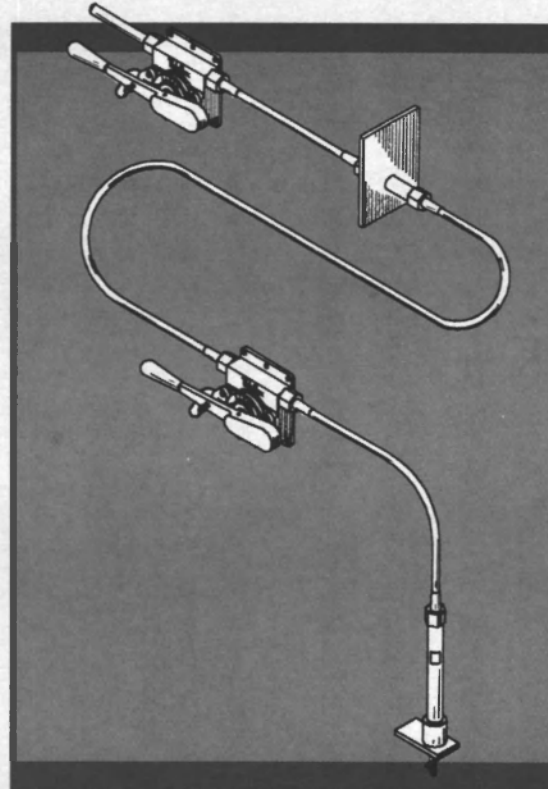
Simpler by design: Teleflex Remote Valve Operators — RMVA, RTVA, and RVVO — are clearly in a class by themselves. Each system employs the Teleflex Flexible Cable Technology to mechanically transfer rotary and linear motion through complex routings over long distances.

Proven Cost Effective: Whatever type of valves you need to operate, Teleflex can provide a system that is easy to install and maintenance free. Teleflex Remote Operator Systems are totally reliable in harsh environments. They are designed to exceed the shock, vibration, and corrosion resistance requirements for naval, commercial marine, and industrial applications. No other equipment comes remotely close.



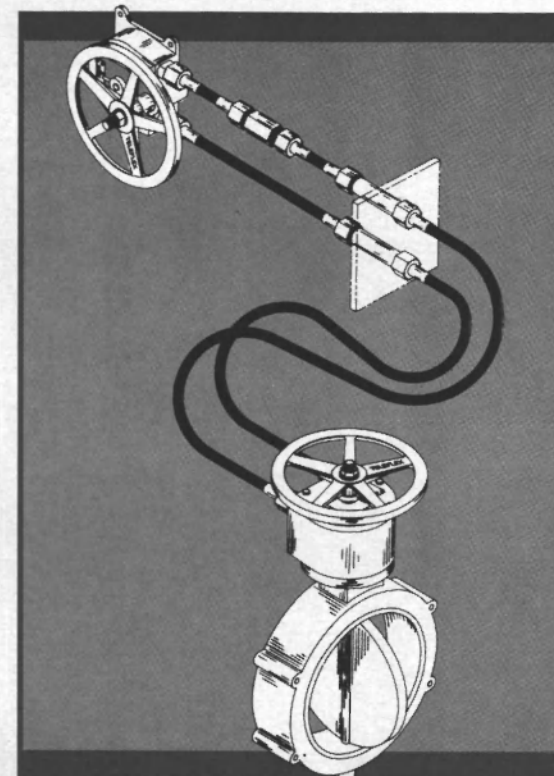
RMVA: Remote Mechanical Valve Actuator Systems for applications requiring delivery of multiple-turn rotary motion from remote locations.

- Meets U.S. Navy MIL-STD-777E and Tech. Manual S6435-QJ-MMC-010



RTVA: Remote Trip Valve Actuator Systems for applications requiring delivery of quick-acting linear motion from remote locations. Systems include a patented shock compensator coupling.

- Meets U.S. Navy MIL-A-24780 and Tech. Manual S6438-AA-DDT-010/ODME5



RVVO: Remote Vent Valve Operator Systems are lightweight, low-profile operators that bolt directly to flanges of 1/4-turn ventilation valves. Systems incorporate a patented over-ride feature at the valve for local operation.

- Meets U.S. Navy Tech. Manual S6435-QJ-MMC-010

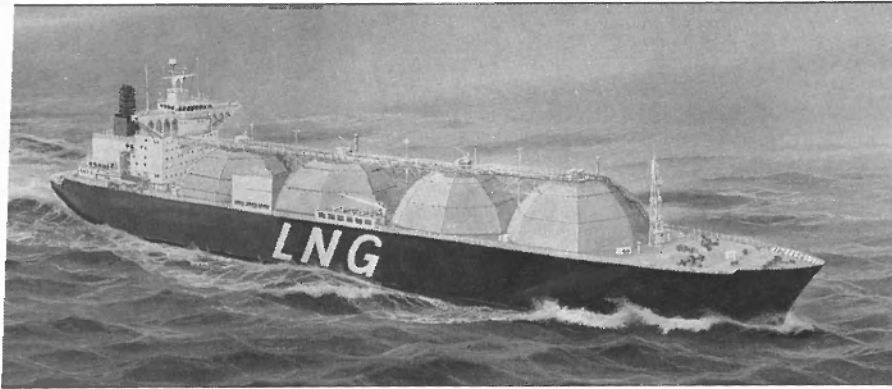
Call or write for complete Design Manuals on each system.

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Specifics Released On Kvaerner Masa's \$1 Billion LNG Tanker Project For Abu Dhabi



An artist's rendition of the Kvaerner LNG carrier ordered by Abu Dhabi.

As reported in the May 1993 issue of Maritime Reporter, Kvaerner Masa-Yards has won a contract worth approximately \$1 billion for the construction of four 135,000 square meter LNG carriers from Abu Dhabi National Oil Company. The order is the largest in the

Kvaerner Group's history and also marks the largest order ever placed in Finland.

The vessels, each of which is designed to measure 948 feet with a beam of 158 feet and a 37-foot draft, will be constructed at the Turku New Shipyard and delivered in 1996

and 1997.

Propelled by 40,000-hp steam turbine power plants driving a 28-foot diameter fixed pitch propeller, the vessel will have a service speed of 19.5 knots and will be deployed shipping gas from Abu Dhabi to Japan.

Each vessel will be outfitted with four spherical LNG tanks of the Kvaerner Moss design.

Kvaerner Masa-Yards has, during the last four years, carried out development work on LNG carrier design and construction.

A new, more efficient LNG tank manufacturing method has been developed at the Turku New Shipyard. The shell segments are made of large, multi-plated high energy MIG welded flat panels.

After NC water-injected plasma are cut, they are heat die-formed to an exact spherical curvature. Using this method, up to 55 percent of the welding can be performed on flat panels.

For more on the building capabilities of Kvaerner Masa,

General Dynamics, Electric Boat Division, Awarded \$12.4 Million By Navy

The Groton, Conn.-based Electric Boat Division, of General Dynamics Corporation, was awarded a \$12.4 million contract by the Naval Sea Systems Command to provide OM-NIBUS engineering and technical services for Ohio Class ballistic missile submarines.

Newport News Wins \$10 Million Contract For Navy Ship Repair

Newport News Shipbuilding and Drydock Company of Newport, News, Va., was awarded a \$10 million contract by the Newport News Supervisor of Shipbuilding, Conversion and Repair, U.S. Navy, for the post shake-down availability of the Los Angeles Class nuclear attack submarine U.S.S. Boise (SSN 764).

Circle 84 on Reader Service Card

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Dayton T. Brown, Inc. provides complete test services for shipboard qualification testing in

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June, 1993

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BOATS AND BARGES

Advanced Maritime Fast Patrol Boat Under Development By Atlantic Boat Group

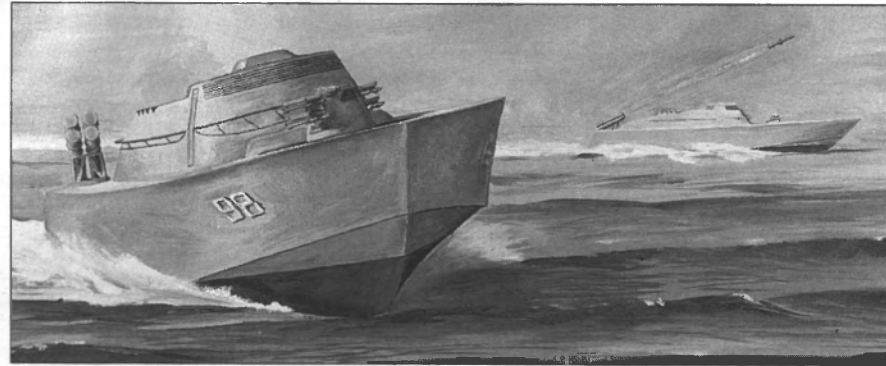
Atlantic Boat Group of Atlanta, Ga. has announced its intention to develop a new high-speed patrol boat. It will be powered by four Textron Lycoming TF40 marine gas turbine engines in conjunction with two 16V-149TI DDEC Detroit Diesel engines and Cincinnati Gear transmissions.

According to **W. Dennis Suit**, president, Atlantic Boat Group, the Advanced Maritime Fast Patrol Boat will be built of advanced composite construction with significantly reduced radar, thermal and acoustic signatures. The craft will have an overall length of 98 feet, draft of 4.5 feet, speed of 70 knots

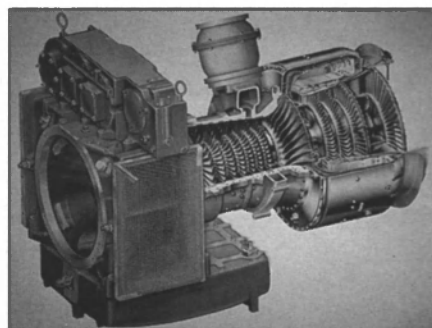
and a range of 3,000 nautical miles. It will be designed to carry an exceptionally heavy load: 50,000 pounds of weapons or other special mission equipment.

The craft's propulsors will be twin waterjets coupled to four Textron Lycoming TF40 gas turbine engines providing 18,000 shp for high speed operations. Commenting on the use of the TF40 gas turbine engine, **Carroll Oates**, Lycoming's manager of marine industrial products, said, "This engine has proven reliable through more than 600,000 hours of operational experience in the U.S. Navy's Landing Craft Air Cushion (LCAC) and is the only turbine in its hp Class to pass the rigorous 1,000 hour Navy qualification test. Further, the high power-to-weight ratio, excellent fuel economy, small size/volume, and minimum maintenance requirements of the TF40 make it an excellent choice."

Two 16V-149TI DDEC Detroit diesels will provide 4,000 HP for low speed operations and long range cruise. The propulsion package will be coupled through Cincinnati Gear MA110 transmissions in a combined diesel or gas (CODOG) installation



Advanced Maritime Fast Patrol Boat being developed by Atlantic Boat Group.



Textron Lycoming TF40 marine gas turbine.

arrangement. Cincinnati Gear's extensive technical experience in the design, manufacture and testing of reduction gear systems for naval applications insist on minimal gearbox signature noise. The proposed propulsion package will enhance the utility of the boat by providing the added advantage of being able to bring the turbines on line for an extra surge of speed.

The craft is being developed to conform to the changing needs of worldwide navies as they plan for the 21st century. Primary considerations will be the resizing of naval forces and the need to command the seas and engage in and carry out missions in the complex operating environment of the earth's coastal regions.

Built of reconfigurable modules with multi-mission capabilities, the Advanced Maritime Fast Patrol Boat will be able to be deployed in a hit-tech role as a guided missile patrol boat capable of carrying a wide range

of surface-to-air (SAM) and surface-to-surface (SSM) missiles, including cruise missiles such as the Tomahawk. Configured as a gun boat or close-in fire support platform, the boat will be capable of carrying an assortment of guns, mortars and rockets such as the MLRS. Additionally, it will be able to be reconfigured to support special operations insertion/extraction missions, as a delivery/support craft and/or mine countermeasures operations, as a mini-tender and/or command, control, communications and intelligence (C3I) platform, and for anti-submarine warfare (ASW).

Preliminary design work is being performed by the naval architecture firm Sparkman & Stephens of New York. A prototype is expected to be ready for initial performance and evaluation tests by the middle of 1994. For more information on the Atlantic Boat Group,

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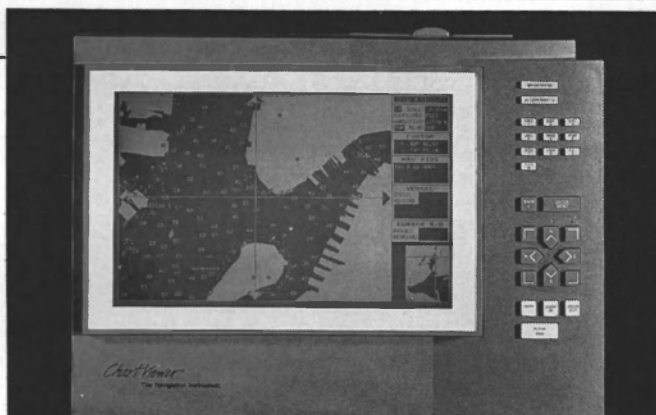
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Circle 238 on Reader Service Card

Maritime Reporter/Engineering News

Wartsila Diesel To Power New Sulfur Carrier

The first commercial ship built in the U.S. in the 1990's will be powered by Wartsila Diesel. Annapolis-based Wartsila Diesel, Inc. is supplying the propulsion equipment and auxiliary power for a sulfur carrying vessel owned by Sulfur Carriers, Inc., being built at McDermott Shipyard in Morgan City, La.

The main propulsion engine is a Wartsila Vasa 8R46, rated at 9,840 bhp at 500 rpm. Wartsila Diesel is also supplying the reduction gear, controllable pitch propeller package and all controls, as well as the complete fuel system sized for 700 centistoke fuel, the lube oil system, plus seawater and freshwater cooling systems. The auxiliary power package consists of three Wartsila Vasa 6R22 gensets, 827 kW at 900 rpm. All of the equipment is being pre-engineered, pre-packaged and skid-mounted by Wartsila Diesel, enabling McDermott Shipyard to streamline its own engineering and installation costs. Delivery is scheduled for this month. Upon its completion, the SCI vessel will transport molten sulfur between New Orleans, La. and Tampa, Fla. for Freeport-McMoran, Inc., the New Orleans-based mining and mineral concern.

For more information on Wartsila Diesel,

Circle 74 on Reader Service Card

APC To Pursue Shipbuilding Program

American President Companies (APC) announced it is negotiating with Howaldtswerke-Deutsche Werft AG, of Germany, and Daewoo Shipbuilding and Heavy Machinery Ltd., of Korea, for the construction of six new containerships as part of a fleet modernization program.

The ships will be deployed in the trans-Pacific services of APC's subsidiary, American President Lines (APL). The vessels will be similar in design to APL's current C10-class containerships in the Pacific. Each vessel will have a capacity of 4,800 20-foot equivalent units and a service speed of 25 knots. According to APC, introducing the vessels to the trans-Pacific service will result in only a marginal increase in APL's overall trans-Pacific capacity, as contemplated ship replacements and service adjustments are made by the company.

Whether or not the vessels will be operated under U.S. flag will be determined by the course of this year's U.S. maritime reform legislation, according to APC Chairman **John Lillie**. Mr. Lillie said, "We have an excellent current opportunity to further modernize our fleet. We hope that these ships will be new additions to the American merchant fleet, but existing U.S. maritime policy must be significantly changed in order to allow us to operate them under the American flag." Mr. Lillie added that the company is hopeful the Administration will initiate an

adequate maritime reform program this month. APC is anticipating the capital expenditure for these contracts to be \$500 million over the next three years, which is expected to be primarily funded by approximately \$400 million of new ship financing. APC is Based in Oakland, Calif., and provides container transportation and related services in North America, Asia and the Middle East through an intermodal system combining ocean, rail and truck transportation.

Logicon Receives \$12.5 Million Navy Option

The Navy has exercised the second-year option of a contract in support of tactical Naval communications systems valued at \$12.5 million, according to Logicon Inc. The option brings the total value of the five-year pact the Navy has with Logicon to \$38 million.

The potential value of the contract is \$64 million if all option years

are utilized.

Under the pact, Logicon supports the Navy Center for Tactical Systems Interoperability, whose mission is to ensure the Navy's ability to communicate among its own tactical command and control systems and with the systems of other services and allied forces.

The pact also calls for Logicon to upgrade software previously developed by the company for the Navy's Multiple Unit Link Test and Operational Training System.

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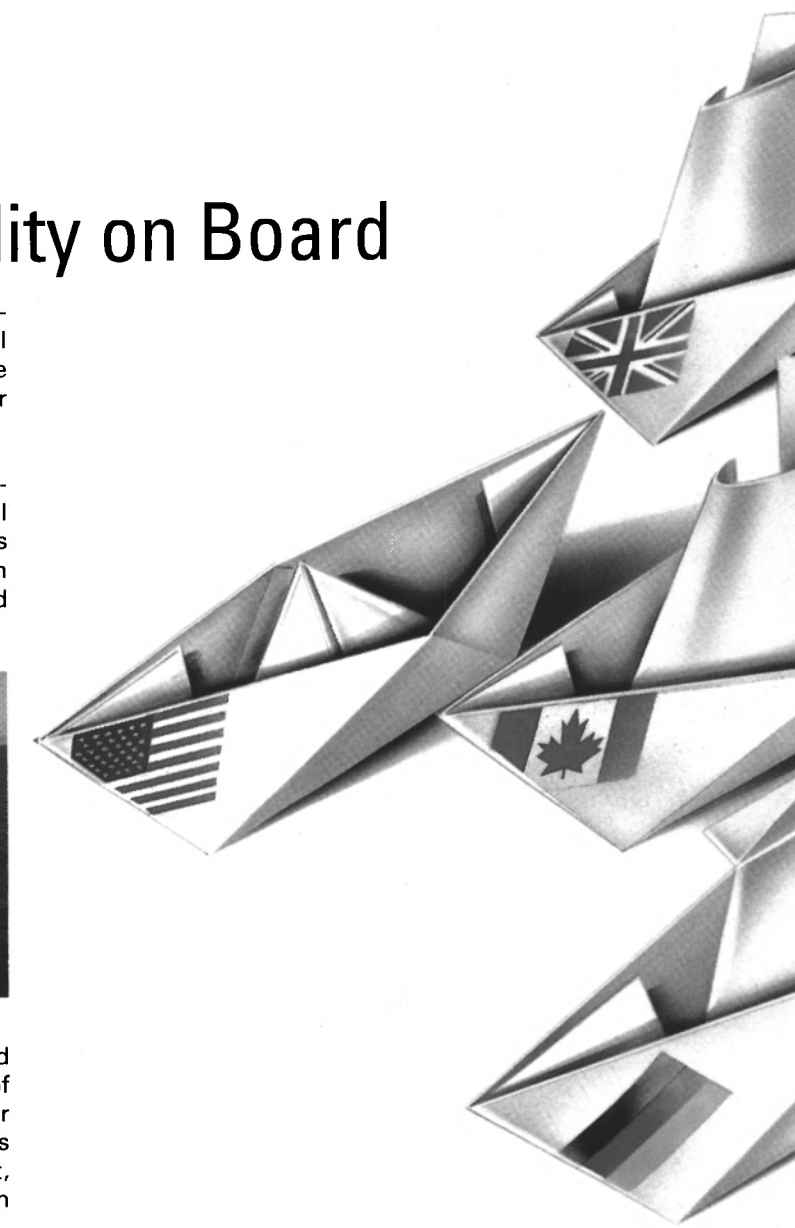
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The M/V Fides, recently delivered by Flender Werft.

Flender Werft Delivers Container/Car Carrier "Fides"

In completion of a contract received in December of 1990, the Lubeck Flender Werft AG company delivered the 584-foot "Fides," a Ro/Ro trailer/container/car carrier.

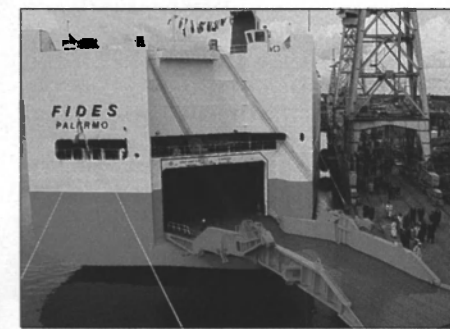
The ship has nine continuous decks and is a single-screw type designed for worldwide voyage with a forward arranged bridge and an aft-arranged machinery plant. Hull,

machinery and equipment were built as per the rules and regulations of the American Bureau of Shipping and the Registro Italiano Navale.

The ship and its equipment were designed to ensure uninterrupted navigation year round. Loading and unloading of cars is accomplished via a stern quarter ramp which leads to the main deck, as well as a side ramp. The primary task of the Fides is the transport of trucks, trailers, cars, containers and general cargo. The vessel can hold up to 2,400 cars, 102 trucks and trailers and 504 containers in two tiers.

The ship was built with a raked stem with bulbous bow and a transom stern with a quarter ramp. The lower part of the cargo hold area is a double hull. The Fides is propelled by two non-reversible ship Sulzer 8ZA 40 S diesel engines, each with an output of 5,760 kW, which work via elastic couplings, one hydraulically actuated multi-disk clutch each and one single step double reduction gear on a shaft plant with a controllable pitch propeller.

Power generation is provided by three diesel gensets, one shaft generator and one emergency generator. The three auxiliary diesel en-



gines are Sulzer 6 S 20 four stroke engines with exhaust gas turbocharging. The automation concept of the ship is designed such that a global monitoring of the engine plant and the auxiliary plants is possible from the bridge. An engine control room is not provided. The total system for the propulsion and the auxiliary machinery has been designed for one-man operation and monitoring. For ship management there is also a cargo computer for calculating the strength and stability values.

For more on Flender Werft,

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FIDES Equipment List

Main engine	Sulzer
Propeller and Shafting	KaMeWa
Bowthruster	KaMeWa
Bowthruster motor	STN
Auxiliary engines	Sulzer
Generators	A. van Kaick
Shaft generator	STN
Gear	Renk Tacke
Engine controls	STN
Steering controls	Anschutz
Deck machinery	Brohl
Coating	Dittmer
VHF, SSB radio	Telemar
Radar	Atlas Elektronik
Compass	Anschutz
Autopilot	Atlas Elektronik and Anschutz
Pumps	Allweiler, Dudek
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Maritime Reporter/Engineering News

A SUCCESSFUL NAVAL ENGAGEMENT FOR THE J.D. NEUHAUS TASK FORCE.

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Saving the day for our customers is always satisfying, but for JDN it's not new. Our hoists have been solving weighty problems in more than 90 countries all over the world.

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

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

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

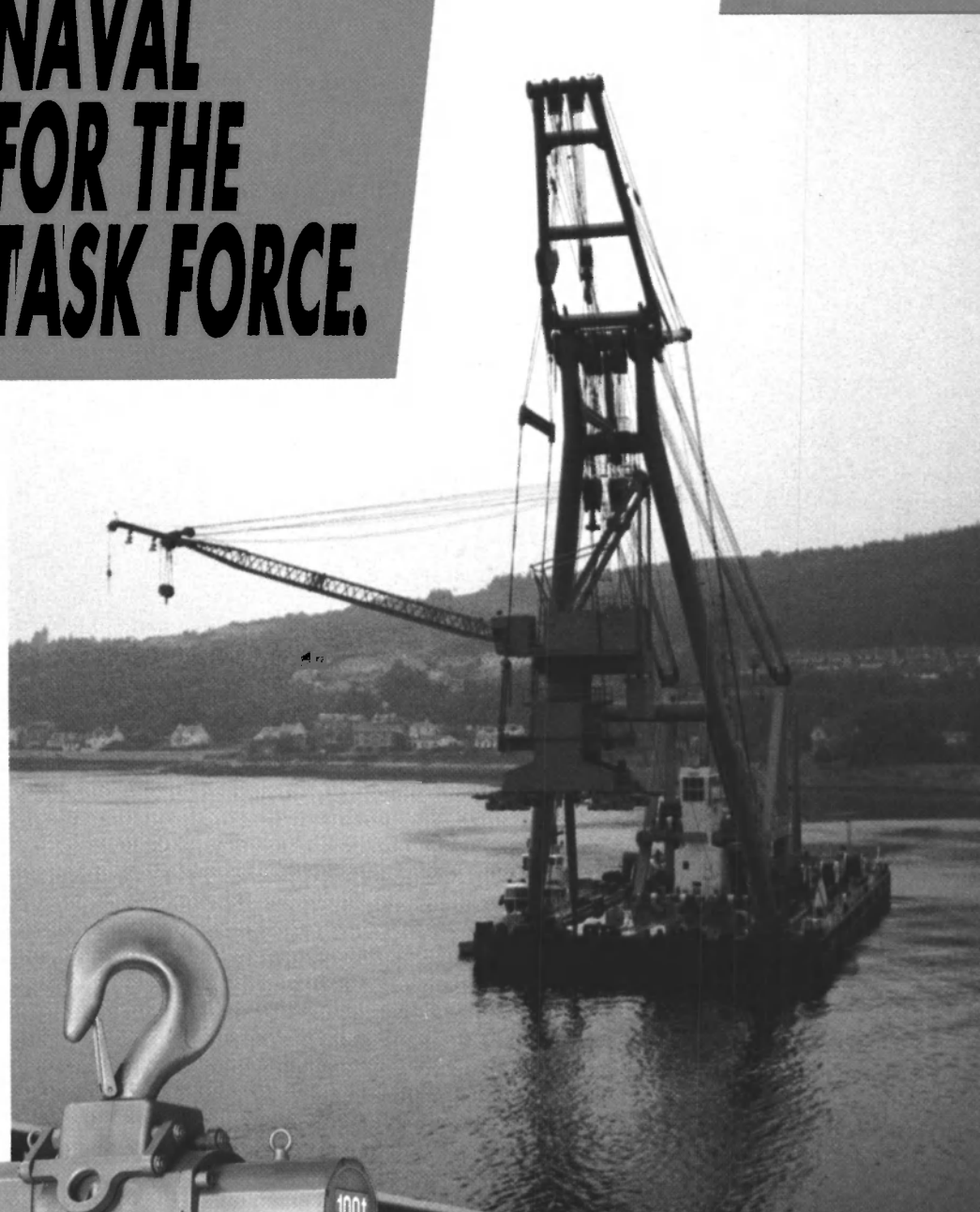
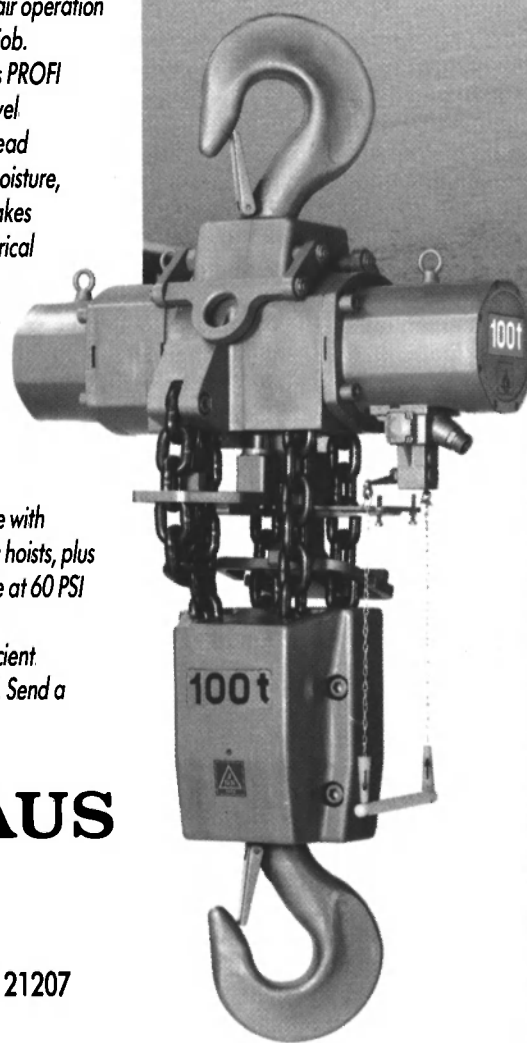
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DEPARTMENT OF THE NAVY
CHARLESTON NAVAL SHIPYARD
HOLY LOCH, SCOTLAND
CHARLESTON, S.C. 29405-0100

APR-7/9200
Ser. 212/1114
18 November 1987

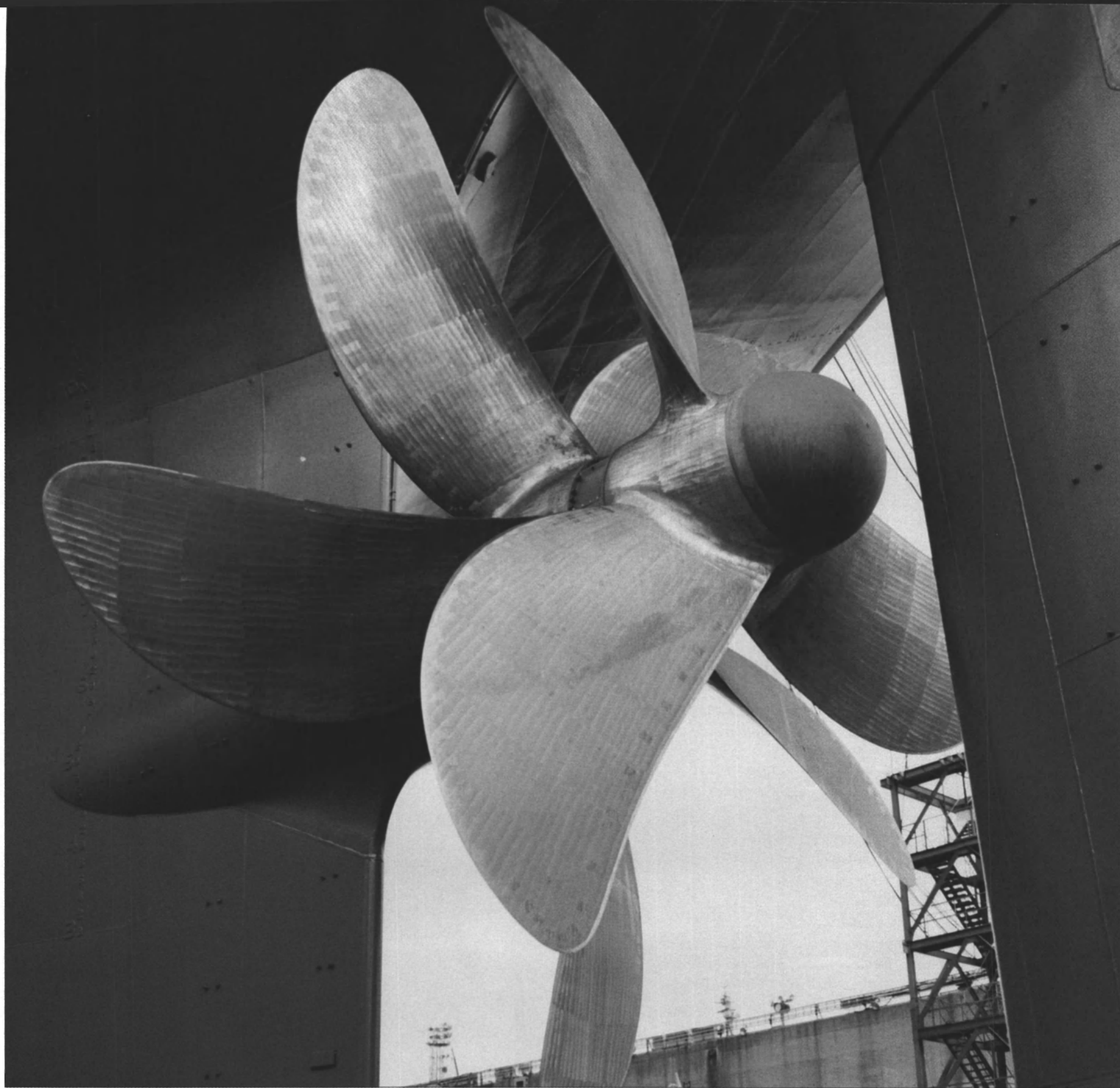
From: Commander, Charleston Naval Shipyard
To: J.D. NEUHAUS, Baltimore, MD 21207
Subj: DELIVERY OF TWO 100 TON PNEUMATIC OPERATED CHAIN HOISTS
ON CONTRACT N0612-87-7531
Encl: (1) NAVSHIPD CHAIN Photograph of New APB-7 Crane Lift
in Holy Loch Scotland (2 copies)

1. The purpose of this letter is to commend your Mr. Donald T. Plattenberg for his dedicated support and exemplary performance in the handling of many details for delivery of the two 100 ton chain hoists on our Contract N0612-87-7531. NAVSHIPD Charleston appreciates the quick action and delivery to support our schedule for loading the two new portal cranes and shipment to Holy Loch.

2. Enclosure (1), shows the new (310 ton lift) crane being moved in Holy Loch by SHIT International floating crane, TAE 1177, to US Navy Drydock, USS LOS ALAMOS (APB-7). Your 100 ton pneumatic powered chain hoists are used to level the new portal cranes so that the sixteen wheels will land on the rails simultaneously. The project was a great success as one new crane was loaded in the morning and the other one in the afternoon.

3. Please present one of these photographs to Mr. Plattenberg with our sincere appreciation for a job well done.

A. H. ANDERSSON
A. H. ANDERSSON
Acting



WORLD SHIPBUILDING

Completions Rise, Orders Drop During 1992

The world shipbuilding numbers from 1992 were not as glowing as many had hoped, however there are some bright spots.

According to Lloyd's Register, new orders for all ship types dropped nearly 36 percent as compared to 1991 figures. To date, new orders reportedly totaled 12.8 million gross tons, roughly 5.8 million gross tons less than the same period last year.

However, ships completed dur-

ing the year reportedly totaled 1,506 ships and more than 18.5 million gross tons, over 2.5 million more gross tons than the year prior.

Leading the way for 1993 and beyond, at the moment at least, are the tanker and cruise ship categories. The recent proliferation of environmental legislation, coupled with the age of the world tanker fleet and the ensuing pressure from the world classification societies and

insurers, will pressure operators to drive tanker newbuilding in the 1990's, according to **Ian Marriott**, Drewry Shipping Consultants, Ltd., London. According to figures compiled by Lloyd's Register, the total tanker tonnage broken up was the largest for the past six years, and was more than 15 times the total of two years ago.

Also, according to a recent report compiled by IMA Associates, Inc.

(Washington, D.C.), at the beginning of 1993 there were 373 tankers on order worldwide representing approximately 29.6 dwt.

Recent tanker contract news includes Mitsubishi getting a \$105 million contract for a 240,000-dwt VLCC, and three Japanese firms, including Mitsubishi Heavy Industries, Kawasaki Heavy Industries and Mitsui Engineering and Shipbuilding close to an accord for seven

ALL SHIPS IN THE WORLD ORDER BOOK

(BEGINNING OF FIRST QUARTER, 1993)

Country Building	Under Construction		Not Commenced		Total		Percentage Of World Tonnage	DWT
	No.	GT	No.	GT	No.	GT		
ARGENTINA	16	49,070	4	22,320	20	71,390	0.19	68,154
AUSTRALIA	14	11,380	—	—	14	11,380	0.03	4,010
AUSTRIUM	12	59,399	3	10,000	15	69,399	0.19	73,392
Brazil	32	652,941	12	355,000	44	1,007,941	2.70	1,581,805
Canada	17	157,013	5	72,590	22	229,603	0.62	339,970
CHINA	4	26,900	—	—	4	26,900	0.07	3,900
Denmark	12	7,148	5	4,135	17	11,283	0.03	5,583
FINLAND, PEOPLE'S REPUBLIC OF*	51	724,754	76	1,290,171	127	2,014,925	5.40	3,351,900
FRANCE, REPUBLIC OF (TAIWAN)	8	389,000	13	802,800	21	1,191,800	3.19	2,072,700
GERMANY	21	572,757	9	341,000	30	913,757	2.45	1,348,870
HONG KONG	2	240	—	—	2	240	0.00	—
CZECHOSLOVAKIA	8	18,337	4	8,861	12	27,198	0.07	39,677
DENMARK	19	273,422	27	1,388,046	46	1,661,468	4.45	2,933,436
Egypt	11	24,500	6	21,080	17	45,580	0.12	59,750
FINLAND	1	3,125	—	—	1	3,125	0.01	450
FRANCE	6	249,895	5	108,367	11	358,262	0.96	160,844
GERMANY	11	176,842	4	420,000	15	596,842	1.60	322,720
GREECE	63	780,560	77	703,506	140	1,484,066	3.98	1,418,781
MEXICO	7	9,330	1	5,000	8	14,330	0.04	3,850
GUATEMALA	—	—	1	130	1	130	0.00	—
HONG KONG	1	110	—	—	1	110	0.00	—
HUNGARY	3	4,050	2	2,700	5	6,750	0.02	13,600
IRELAND	—	—	1	120	1	120	0.00	—
INDIA	54	97,156	13	59,510	67	156,666	0.42	230,326
INDONESIA	25	87,269	6	32,800	31	120,069	0.32	137,650
IRAN	6	2,463	39	9,617	45	12,080	0.03	3,320
ISRAEL	1	267	2	534	3	801	0.00	—
ITALY	62	804,683	14	489,220	76	1,293,903	3.47	1,543,921
JAPAN	253	6,901,665	228	6,347,536	481	13,249,201	35.49	20,138,065
KOREA (NORTH)	—	—	1	9,626	1	9,626	0.03	8,000
KOREA (SOUTH)	55	3,239,617	75	3,789,104	130	7,028,721	18.83	11,877,275
LEBANON	1	300	—	—	1	300	0.00	—
MALAYSIA	9	28,338	—	—	9	28,338	0.08	35,800
MALTA	6	25,980	3	7,800	9	33,780	0.09	42,040
MEXICO	13	20,848	13	1,712	26	22,560	0.06	25,270
MOROCCO	2	755	1	300	3	1,055	0.00	—
NETHERLANDS	42	134,505	16	74,749	58	209,254	0.56	146,364
NORWAY	22	115,553	14	120,440	36	235,993	0.63	292,984
PAKISTAN	2	8,350	1	8,200	3	16,550	0.04	18,800
PERU	43	19,811	—	—	43	19,811	0.05	8,600
PHILIPPINES	1	546	—	—	1	546	0.00	720
POLAND	82	643,874	52	618,823	134	1,262,697	3.38	1,549,826
PORTUGAL	30	95,066	5	11,540	35	106,606	0.29	173,047
ROMANIA	75	988,568	6	199,067	81	1,187,635	3.18	1,916,753
RUSSIA*	7	60,206	82	296,300	89	356,506	0.95	483,666
SINGAPORE	23	66,033	6	8,378	29	74,411	0.20	100,744
SOUTH AFRICA	1	8,939	—	—	1	8,939	0.02	10,200
SPAIN	55	574,901	21	19,486	76	594,387	1.59	914,948
SRI LANKA	1	380	—	—	1	380	0.00	—
SWEDEN	4	19,385	—	—	4	19,385	0.05	7,134
TURKEY	26	163,716	15	43,148	41	206,864	0.55	317,053
UKRAINE*	4	17,628	11	245,001	15	262,629	0.70	384,515
UNITED KINGDOM	17	258,041	14	647,508	31	905,549	2.43	1,657,308
UNITED STATES OF AMERICA	52	38,053	66	18,472	118	56,525	0.15	69,337
VENEZUELA	4	800	—	—	4	800	0.00	—
YEMEN	1	144	—	—	1	144	0.00	250
YUGOSLAVIA	14	55,416	13	48,600	27	104,016	0.28	134,304
WORLD TOTAL	1,312	18,670,029	972	18,663,297	2,284	37,333,326	100.00	56,031,612

* Information incomplete.
Source: Lloyd's Register.

LNG ships, at an estimated contract price of \$2.15 billion.

The more recent news of cruise ship orders also offers hope. Celebrity Lines ordered up to three (one firm, two option) 1,740-passenger ships recently from Meyer Werft; Carnival ordered what will be the largest (95,000-gt) cruise ship from Fincantieri; and NYK has ordered a 47,000-gt ship from Finland's Kvaerner Masa-Yard.

1992 Completions

The 18.6 million gt's of all types of vessel completed in 1992 marks the fourth consecutive annual rise, according to Lloyd's Register. Tanker completions have risen in each of the past five years, and the 9.3 million gt recorded in 1992 is approximately a 300 percent increase over 1987 numbers, according to LR's annual survey. Also on the rise in 1992 were completions of general cargo/container vessels. At 3.87 million gt, this is the highest it has been in seven years according to LR. The following are some highlights of 1992 deliveries:

— Cruise Ships: the 47,255-gt Zenith, delivered by Meyer Werft; the Royal Majesty from Kvaerner Masa-Yards; and the Statendam from Fincantieri.

— Gas Carriers: the Northwest Seaeagle, a 125,000 metric³ LNG carrier, from MHI Nagasaki; and a pair of 130,000 metric³ LNG carriers started by Chantiers de l'Atlantique.

— Other Ships: the Bunga Pelangi, a 4,469-teu container carrier from Hyundai; the Jervis Bay and Repulse Bay, 4,038-teu container ships, from IHI Kure; the 95,000-dwt Patriot from Samsung Heavy Industries; the R.J. Pfeiffer, a 21,500-dwt container ship from National Steel and Shipbuilding Company; the Futura, a 95,000-dwt double hull tanker from Kvaerner Masa; the 4,024-teu containership Hanjin Osaka from Hanjin Heavy Industries; and the 320,000-dwt ore carrier Bergeland from Hyundai Heavy Industries.

Breakdown By Country

According to the Lloyd's Register survey, the top five countries based on gross tons completed included Japan; South Korea; Germany; China, Republic of (Taiwan); and Denmark, with Japan accounting for 40.7 percent of the world tonnage and South Korea accounting for 25.6 percent.

In Japan, completions totaled 7,581,728 gt, with tankers accounting for more than 61 percent of that figure. The two largest of these tankers were sister ships, the 281,598-dwt New Valor and the 291,640-dwt New Venture.

In South Korea, gross tonnage completed rose to a total of 4,766,704 gt. More than half of the Korean completions were oil tankers, and

the two largest ships completed during 1992 were the sister ships Golar Stirling and Golar Glasgow, both delivered by Daewoo Shipbuilding and Heavy Machinery.

Gross tonnage completed rose in the People's Republic of China to a total of 360,735 gt, while the total for the Republic of China (Taiwan) totalled 698,932 gt.

In Germany, the tonnage completed in 1992 totalled 903,555, with twenty one container ships com-

prising 56.4 percent of that total. The largest of these were the 47,230-dwt Zim Isrel and Zim Hong Kong from HDW.

In all, 35 general cargo ships were delivered, including the 22,986-gt passenger/RoRo cargo ferry European Highway from Schichau-Seebeckwerft.

Finally, in Denmark, completions rose by a total of 155,870 gt to a total of 599,878 gt.

Two tankers were completed dur-

ing 1992, the largest delivered by Odense Staalskibsvaerft A/S, the 289,900-dwt Eleo Maersk. Ore and bulk carriers accounted for 34.3 percent of the Danish total.

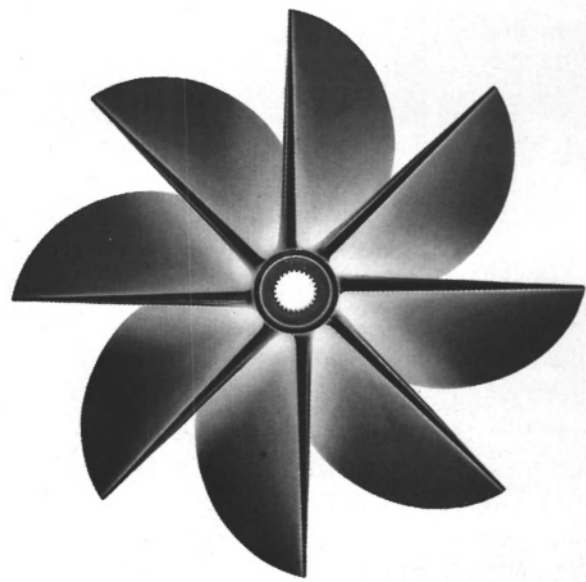
By vessel type, oil tankers accounted for 49.8 percent of all tonnage completed in 1992, compared with 42.1 percent in 1991 and 32 percent in 1990. Bulk carrier tonnage dropped by more than 320,000 gt and accounted for 18.1 percent of all tonnage, compared with 23 per-

cent in 1991.

The output of general cargo ships rose in 1992, and represented 9.1 percent of the total tonnage completed. The two leading builders in this category were Japan and Germany. The completion of container ships totalled 2,172,863 gt, or 263,173 more than in 1991.

Finally, Liquefied Gas and Chemical Carriers accounted for 125 ships and 882,656 gt's in 1992.

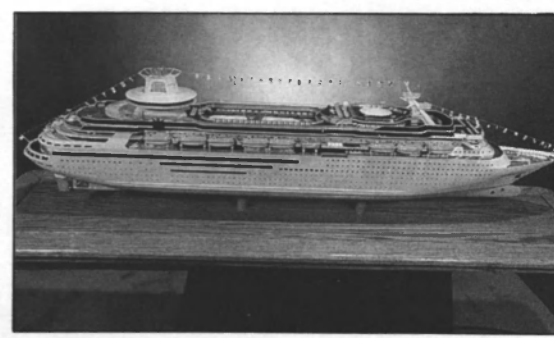
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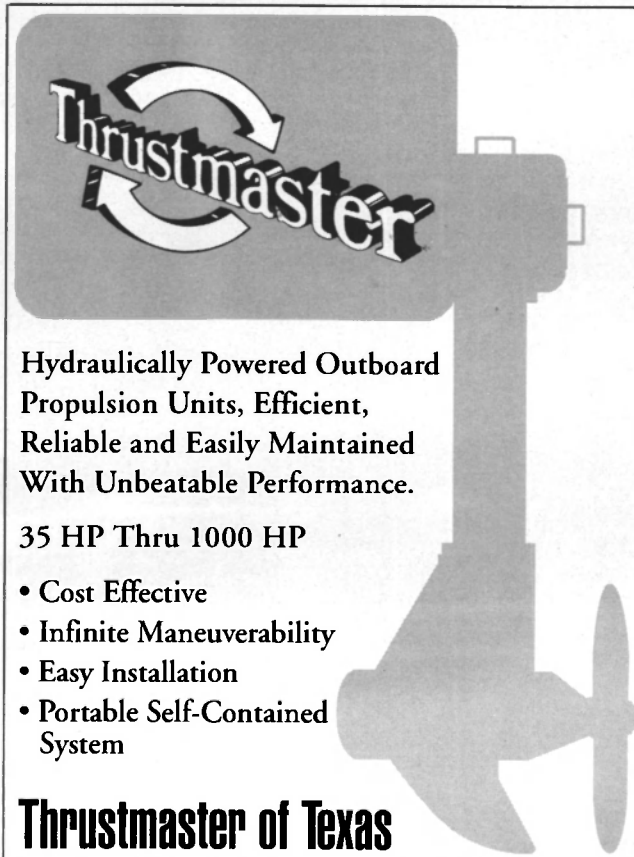
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DOD Awards Contracts To Raytheon Worth Approximately \$75 Million

Raytheon Company was awarded two separate contracts from the Department of Defense totaling \$74.8 million.

Raytheon's Sudbury, Mass.-based equipment division received a \$69 million contract from the Strategic Systems Program Office for engineering support of Trident submarine launched ballistic missiles.

The equipment division's Marlborough, Mass. office won a contract modification worth \$5.8 million for studies leading to changes in the AN/USC-38(V) electronics system from the Space and Naval Warfare Systems Command.

Martin Marietta Wins \$9.5 Million VLS Contract

Martin Marietta Technical Services, Inc., of Baltimore, Md., has won a \$9.5 million contract from the Naval Sea Systems Command to provide support to MK 41 vertical launching systems, used aboard the fleet's Ticonderoga (CG 47) Class cruisers and Arleigh Burke (DDG 51) Class destroyers to launch Standard, Tomahawk and anti-submarine missiles.

General Electric Receives Two DOD Contracts Worth \$27.4 Million

General Electric Company has been awarded two Pentagon contracts worth a combined \$27.4 million.

GE's government electronic systems division, of Moorestown, N.J., received a \$21.5 million Naval Sea Systems Command contract modification to give the Aegis phased-array radar and weapons control system, fitted to the Navy's Ticonderoga (CG 47) and Arleigh Burke (DDG 51) Classes, a cooperative engagement capability.

The company's defense systems department, in Pittsfield, Mass., also won a \$5.9 million contract from the Strategic Systems Programs Office for a Navigation Interface Subsystem SPALT to the C-4 fire control system for the fleet ballistic missile program.

Maritime Reporter/Engineering News

Marco To Build 15 VOSS Skimmers For NRC

Marco Pollution Control of Seattle, Wash., has signed a contract with National Response Corporation (NRC) to build 15 Class XI-C VOSS skimmers for oil spill recovery in shallow water and offshore/open ocean environments. NRC is the oil spill removal organization based in Calverton, N.Y., that enjoys a customer base of more than 200 companies representing more than 1,500 tank vessels.

The Marco Class XI-C VOSS (vessel of opportunity skimming system) consists of a Filterbelt oil and debris recovery unit with powerful flow induction pump and positive displacement Archimedes screw discharge pump mounted on an aluminum frame with inflatable flotation. It removes the oil directly without requiring further separation. Effective on all types of oil and in a variety of spill conditions, the Marco Filterbelt has proven to be superior in the clean-up of many major spills around the world, from the Persian Gulf to Prince William Sound.

The Class XI-C VOSS skimmer is a new version of the Class XI skimmer used extensively by the Navy's Supervisor of Salvage during the Valdez spill clean up operations in Prince William Sound. It includes an efficient induction pump, simplified controls and easy maintenance. The versatile Class XI-C can be used in a variety of deployment modes. The skimmer can be towed alongside a vessel in V-boom configuration, towed between two vessels, or pushed ahead of or alongside a small vessel.

The first of the Class XI-C VOSS skimmers for NRC will have the "combi" option package complete with adjustable weir and Marco U400 Capsulpump. The "combi" package enables the skimmer to be operated in a weir/pump mode for ultra-high capacity recovery of oils in high encounter rate situations. The unit retains the full three-foot wide Filterbelt sorbent lifting belt capability of its predecessors, providing excellent throughput and recovery efficiency regardless of oil thickness encountered.

Southwest Marine Awarded \$11.5 Million Contract

Naval Sea Systems Command (NAVSEA) announced that Southwest Marine Inc. (SWM) has been awarded an \$11.5 million contract for the regular overhaul of the USS Valley Forge (CG-50). The ship is a Ticonderoga/Aegis class cruiser homeported in San Diego. The vessel will arrive at SWM's repair yard in August of 1993 and is scheduled for delivery in April of 1994.

The work package consists of a 12-week dry-docking period which will include repairs to the underwater hull, sonar dome, sea valves and the Controllable Reversible Pitch Propeller (CRP) System. In addition, major ship alterations will be per-

formed that include hull girder strengthening, upgrading of the foam fire fighting system, upgrading of the Anti-Submarine and Anti-Surface Warfare Systems and galley equipment upgrades. The package also includes repairs to the auxiliary systems (heating and air-conditioning). An average of 250 workers per day will be assigned to the project. **Herb Engel**, president of SWM, said, "We were awarded this contract during the bidding process because of our technical ability and

competitive pricing. When it came down to who could do the job more cost effectively and with the necessary capability - a public sector repair yard or a private sector repair yard - SWM overwhelmingly won."

Singapore's Hitachi Zosen Wins Two Shipbuilding Contracts

Hitachi Zosen Singapore has

landed two shipbuilding contracts worth a total of \$51 million.

The company will build two 10,000-dwt product tankers for a local firm, Ocean Tankers, and two similar tankers for Daichi Shipping (Hong Kong).

The first contract is worth \$25 million and the second is worth \$26 million.

The first of the four 394-foot long vessels is expected to be delivered in 12 months, and the other three during the next two years.

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Nichols To Build 98-Foot Twin-Jet Ferry

A 98-foot, 250-passenger jet catamaran ferry will go into service for the City of Alameda and Port of Oakland next spring, **Ernest Sanchez**, manager of the ferry service, confirmed. The ferry will be built by Nichols Brothers Boat Builders, Inc., Freeland, Wash. **Matt Nichols**, president of Nichols Brothers on Whidbey Island, Wash., said

this vessel will be the 20th catamaran ferry to be built by the Whidbey Island firm and represents the latest technical evolution of the line.

Mr. **Sanchez** said that while the Alameda City Council had awarded the contract for construction of the International Catamaran Ltd. designed ferry to Nichols Brothers late last year, the final size of the ferry had been dependent upon obtaining state funds for construction.

In early May, the California Transportation Commission (CTC)

awarded approximately \$1 million to the Alameda/Oakland Ferry Service for the purchase of the new ferry. The CTC earlier granted the East San Francisco Bay authority \$2.5 million. Funds were made available by the U.S. DOT.

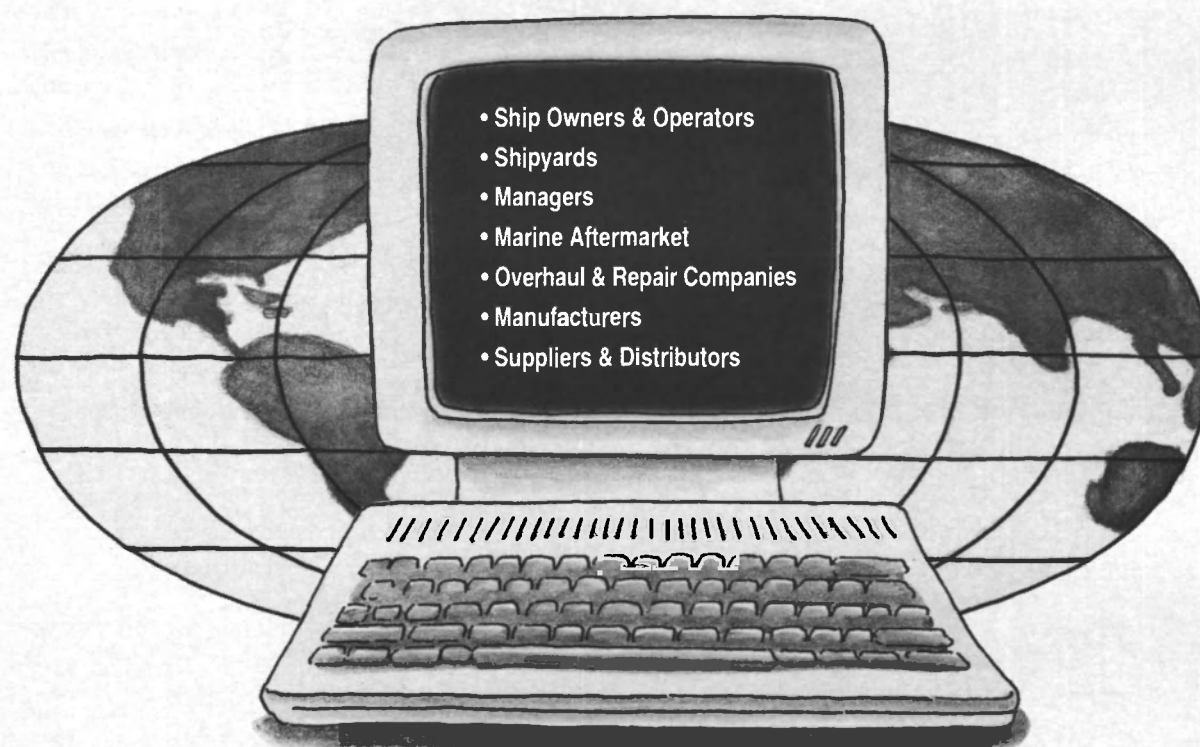
The Alameda/Oakland ferry will provide service between Jack London Square, Alameda Main Street landing, the San Francisco Ferry Building, and Fisherman's Wharf in San Francisco. Mr. **Nichols** said that the new ferry will be powered

by KaMeWa Model 50 waterjets, driven by 1,100-hp 16V92TA Detroit Diesel engines. Each hull will also house 20 kW generators to provide service power. The vessel will have an overall beam of 28 feet, while the twin hulls will each be approximately nine feet wide. The vessel will have a draft of approximately four feet. At full load, the vessel will be capable of 30 knots.

For more on Nichols Brothers,

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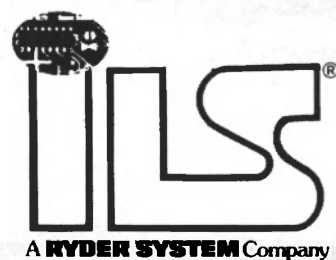
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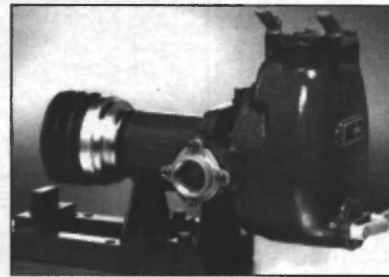
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Cruise Shipping

Recent Orders Help To Buoy Maritime Markets

In an attempt to prepare for the eight million passengers per year projected by the turn of the century, cruise ship owners have been placing orders at a steady pace at the outset of 1993.

With rosy market potential estimates like the Cruise Line International Association (CLIA) (New York) recently released, it is no wonder owners are signing today for ships tomorrow.

Based on the association's best estimate, which takes into account factors such as total population by age, probability of that population taking a cruise, and cruise prices, CLIA estimates that there is more than \$50 billion in revenues to be made in the cruise market.

Another positive indicator is the ten-year trend of capacity increases and the projected continuance of this through 1997.

According to CLIA, in order to keep capacity in line with North American (including Canada and the U.S.) demand, average capacity rose at a rate of 8.2 percent from 1981 to 1992.

Based on current information, the association projects a 4.4 percent capacity increase through the year 1997.

While all of the facts, figures and projections are subjective to uncontrollable forces such as the world economy, probably the best bottom-line indicator of the cruise ship market are recent orders and deliveries. And the beginning of the year to date has seen the signing of some landmark deals.

For example, Carnival Cruise Lines Inc. (CCL) of Miami signed a contract with Italian builder Fincantieri Cantieri Navali Italiani SPA for the construction of the largest passenger cruise ship ever, a 95,000-gt vessel with 1,300 cabins,

for delivery in late 1996.

Additionally, Royal Caribbean Cruise Line (RCCL) signed contracts with Chantiers de l'Atlantique of France, for the construction of up to three ships with a potential value of approximately \$1 billion.

Each vessel is scheduled to be 65,000-gt with the capacity to carry 1,800 passengers double occupancy.

The first ship is scheduled for delivery in April 1995, and the second and third, should the options be exercised, will be delivered in 1996 and 1997 respectively.

Chantiers has delivered four cruise ships to RCCL since 1987.

Finnish builder Kvaerner Masa-Yards got into the act also, and was recently tapped by Japan's NYK Line to build the 50,000-gt Crystal Symphony, scheduled for delivery in the spring of 1995.

The vessel is planned to be nearly 778 feet long with a capacity for 960 passengers, and will be built at the company's Turku New Shipyard.

Rounding out the more recent action was an order placed by Celebrity Cruise Lines Inc. with Germany's Meyerwerft for the construction of a 1,740-passenger, \$317.5-million vessel.

In addition, CCLI has options for two sisterships at approximately the same price. All vessels will be for the Celebrity fleet, which serves the premium segment of the cruise market. The first ship is scheduled for delivery in late 1995.

Two award winning Celebrity ships, Horizon and Zenith, were built by Meyerwerft in 1990 and 1992 respectively.

Perhaps a portion of the reasoning for the relative steady nature of cruise ship orders is the consumer's demand for more diversity. Over the past 10 years, according to the CLIA survey, the industry has re-

ANNUAL PASSENGER GROWTH

Year	Passengers (Millions)	Percentage Growth
1980	1.4	13.5%
1981	1.5	1.7%
1982	1.5	1.2%
1983	1.8	15.2%
1984	1.9	9.9%
1985	2.2	13.4%
1986	2.6	13.8%
1987	2.9	11.0%
1988	3.2	9.5%
1989	3.3	2.4%
1990	3.6	13.5%
1991	4.0	9.5%

Average Growth Rate from 1980 to 1991 = 9.8%

Source: Cruise Line Intl. Association (New York)



sponded to extensive market and consumer research, research with has guided the addition of new destination, new ship design concepts, new onboard/onshore activities, new themes and new cruise lengths. And as illustrated by the chart to the right, there is a steady stream of vessels either contracted or planned for construction in the coming years.

The Caribbean continues to be the number one destination for capacity placement, as this market (which is comprised of Caribbean, Bahamas, and Western Caribbean) accounts for a 50.4 percent share of capacity placement.

Other leading markets include: Western Mexico (9.6 percent); The Mediterranean (9 percent); Alaska (6.7 percent); Trans Cana Cruises (4.9 percent); Europe (4.1 percent); Bermuda (2.8 percent) and Hawaii (1.8 percent).

A final good omen from the North American cruise industry comes from a recent study by Price Waterhouse, which was underwritten by the International Council of Cruise Lines (ICCL).

The study revealed that the cruise industry plans to add 134,712 full time jobs to the U.S. economy in the next four years, this on top of the 450,166 U.S. jobs it currently provides.

The Cruise Lines International Association is a New York City-based Association which represents 97 percent of North American marketed berths. For more information on CLIA call (212) 921-0066.

Cruise Ship Newbuilding

Contract (C) & Planned (P) Through 1997

Line	Vessel	# of Berths	Contract (C) Planned (P)	Delivery
Carnival Cruise Line	Sensation	2,021	C	12/93
Costa Cruise Lines	Costa Romantica	1,322	C	1993
Crown Cruise Line	Crown Dynasty	798	C	4/93
Holland America Line	Maasdam	1,266	C	12/93
Holland America Line	Statendam	1,266	C	1/93
Norwegian Cruise Line	Windward	1,200	C	1993
Carnival Cruise Line	Fascination	2,021	C	12/94
Diamond Cruise	Radisson Ruby	400	P	1994
Silversea Cruises	Silver Cloud	314	C	1994
Silversea Cruises	Silver Wind	314	C	1994
Carnival Cruise Lines	Imagination	2,021	C	1995
Chandris Cruises	Unnamed	2,200	P	4/95
Crystal Cruises	Crystal Symphony	960	C	11/95
Delta Queen Steamboat Co. Belle of America	418	C	1995	
Holland America Line	Ryndam	1,266	C	1/95
Princess Cruises	Sun Princess	1,950	C	1995
Royal Caribbean Cruise	Unnamed	1,750	P	4/95
Carnival Cruise Line	Unnamed	2,600	C	1996
Royal Caribbean Cruise	Unnamed	1,750	P	1996
Royal Viking Line	Unnamed	800	P	1996
World City	Phoenix	5,000	P	1996
Royal Caribbean Cruise	Unnamed	1,750	P	1997

Source: Cruise Line Intl. Association (New York)



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CRUISE SHIPPING

Source: Maritime Reporter

OWNER/OPERATOR Ship	GT	No. of Passengers	Year Built
AMERICAN HAWAII CRUISES, San Francisco, Calif.			
Constitution	30,090	798	51/88
Independence	30,090	798	50/88
ARRIVAL CRUISE LINES, Miami, FL			
Carnivale	27,250	950	56/90
Ecstasy	70,367	2,040	91
Celebration	47,262	1,486	87
Fantasy	70,367	2,044	90
Festivale	38,175	1,146	61/86
Holiday	46,052	1,452	85
Jubilee	47,262	1,486	86
Mardi Gras	27,250	906	62/91
Sensation*	70,367	2,040	91
Tropicale	36,674	1,022	82/89
Set to sail in October 1993.			
PHANDRIS FANTASY / CELEBRITY CRUISES, Miami, Fla.			
Amerikanis	20,000	619	52/88
Azur, The	15,000	663	71/89
Britanis	26,000	922	32/87
Horizon	46,811	1,354	90
Meridian	30,000	1,106	63/90
Victoria, The	19,000	550	36/89
Zenith	47,000	1,400	92
CLASSICAL CRUISES, New York, NY.			
Illyria	3,751	140	62/85
Polar Circle	2,500	80	90
Aurora I	2,928	80	91
Aurora II	2,928	80	91
CLIPPER CRUISE LINE, St. Louis, Mo.			
Nantucket Clipper	100	102	84
Yorktown Clipper	100	138	88
World Discoverer	3,153	138	74/84
CLUB MEDITERRANEE, Paris, FRANCE			
Club Med I	3,994	425	88
COMMODORE CRUISE LINE LTD, Coral Gables, Fla.			
Enchanted Seas	23,500	736	57/90
COSTA, Genoa, ITALY			
Costa Allegra	30,000	800	69/92
Costa Classica	53,700	1,300	91
Costa Marina	25,000	770	69/90
Costa Romantica*	53,700	1,300	93
Enrico Costa	16,000	700	50/89
* Set to sail in November 1993			
CRYSTAL CRUISES, Los Angeles, Calif.			
Crystal Harmony	49,400	960	90
CUNARD CROWN CRUISE LINES, New York, N.Y.			
Crown Dynasty	15,270	530	90
Crown Jewel	20,000	800	92
Crown Monarch	13,991	560	90
Viking Princess	6,421	366	64/85
CUNARD LINE LTD, New York, N.Y.			
Cunard Countess	17,593	790	76/86
Cunard Princess	17,496	750	77/86
Danube Princess	3,400	200	83
Princesse de Provence	2,600	144	92
Prussian Princess	2,600	144	91
Queen Elizabeth 2	66,450	1,815	69/87
Saga fjord	25,147	588	65/86
Sea Goddess I	4,253	120	84/86
Sea Goddess II	4,260	120	85/86
Vistafjord	24,492	736	73/86
DIAMOND CRUISE INC., Helsinki, FINLAND			
Radisson Diamond	18,400	354	92
DISCOVERY CRUISES, Fort Lauderdale, Fla.			
Discovery I	12,244	1,250	70/89
DOLPHIN CRUISE LINE, Miami, Fla.			
Dolphin IV	13,037	588	56/88
Oceanbreeze	14,673	880	55/92
Seabreeze	21,000	840	57/89
HOLLAND AMERICA LINE - WESTOURS, Seattle, Wa.			
MS Statendam	50,000	1,266	92
Nieuw Amsterdam	33,930	1,210	82
Noordam	33,930	1,214	84
Rotterdam	37,783	1,111	59/89
Westerdam	53,000	1,476	86/89
HOTELES MARINOS, Almeria, SPAIN			
Vistamar	6,517	400	89
IVARANS REDERI, Oslo, NORWAY			
*Americana	19,203	88	88
*Passenger-Carrying Container/Cargo Ship			
KLOSTER CRUISE LIMITED, Coral Gables, Fla.			
(Includes Norwegian Cruise Line, Royal Cruise Line and Royal Viking Line)			
Dreamward	41,000	1,246	92
Norway	75,000	2,044	60/90
Seaward	42,276	1,534	88
Southward	16,607	730	71/90

OWNER/OPERATOR Ship	GT	No. of Passengers	Year Built
Starward			
Starward	16,107	758	68/89
Westward	28,000	829	72/89
Windward	41,000	1,246	93
MAJESTY CRUISES, Miami, Fla.			
Royal Majesty	32,400	1,056	92
NIPPON YUSEN KAISHA - NYK LINE, Tokyo, JAPAN			
Frontier Spirit	6,752	184	90
OCEAN CRUISE LINES, Fort Lauderdale, Fla.			
Ocean Pearl	12,456	460	67/88
Ocean Princess	12,200	460	67/84
P & O CRUISES / PRINCESS CRUISES, Los Angeles, Calif.			
Canberra	44,607	1,648	61/86
Sea Princess	27,760	714	66/86
Crown Princess	70,000	1,748	90
Dawn Princess	25,000	890	57/89
Fair Princess	25,000	890	58/89
Fairstar	23,764	850	57/83
Island Princess	20,000	610	71/85
Pacific Princess	20,000	610	71/85
Regal Princess	70,000	1,700	91
Royal Princess	45,000	1,200	84
Sky Princess	46,000	1,200	84/89
Star Princess	63,500	1,470	89
PREMIER CRUISE LINES, Cape Canaveral, Fla.			
Starship Atlantic	19,337	1,600	82/88
Starship Majestic	17,750	950	72/89
Starship Oceanic	19,500	1,500	65/86
PRIDE CRUISE LINE, Galveston, Tex.			
Pride of Galveston	9,114	742	51/73
REGENCY CRUISES, New York, N.Y.			
Regent Rainbow	25,000	960	57/92
Regent Sea	15,294	720	57/85
Regent Star	24,413	960	56/87
Regent Sun	25,500	815	64/82
RENAISSANCE CRUISES, Fort Lauderdale, Fla.			
Renaissance I	4,000	100	89
Renaissance II	4,000	100	89
Renaissance III	4,000	100	89
Renaissance IV	4,000	100	89
Renaissance V	4,300	114	91
Renaissance VI	4,300	114	91
Renaissance VII	4,300	114	91
Renaissance VIII	4,300	114	91
ROYAL CARIBBEAN CRUISES, LTD, Miami, Fla.			
Majesty of the Seas	73,941	2,354	92
Nordic Empress	48,563	1,610	90
Sovereign of the Seas	73,192	2,282	87
SEA CLOUD CRUISES GMBH, Hamburg, GERMANY			
Sea Cloud	2,517	69	31/88
SEA VENTURE CRUISES, Miami, Fla.			
Tropicana	5,000	1,000	66/88
SEABOURN CRUISE LINE, San Francisco, Calif.			
Seabourn Pride	10,000	212	88
Seabourn Spirit	10,000	212	89
SEAESCAPE LTD, Miami, Fla.			
Pride of San Diego	7,764	900	74/88
Scandinavian Dawn	7,356	1,050	68/90
Scandinavian Saga	5,259	900	74/88
Scandinavian Song	8,496	350	66/88
Scandinavian Sun	9,902	1,100	68
SPECIAL EXPEDITIONS, New York, N.Y.			
Polaris	2,214	80	60
Sea Bird	99.7	70	81
Sea Lion	99.7	70	81
STAR CLIPPERS, INC., Miami, Fla.			
Star Clipper	2,298	180	92
Star Flyer	2,298	180	91
SUN LINE CRUISES, New York, N.Y.			
Stella Maris	4,000	180	60/66
Stella Oceanis	3,963	300	65
Stella Solaris	10,595	620	53
WINDJAMMER BAREFOOT CRUISES LTD, Miami, Fla.			
Amazing Grace	1,585	96	55
Fantome	2,400	80	27/91
Flying Cloud	399	78	35
France II	2,000	100	61/92
Mandalay	500	72	23
Polynesian	600	126	38
Yankee Clipper	300	64	27
WINDSTAR CRUISES, Seattle, Wa.			
Wind Song	5,350	148	87
Wind Spirit	5,350	148	88
Wind Star	5,350	148	86
WORLD EXPLORER CRUISES, San Francisco, Calif.			
Universe	16,000	550	53/90

SSE Delivers Tropic Tide Ahead Of Schedule

Singapore Shipbuilding & Engineering Ltd. (SSE) recently delivered BO 321, a 400-teu RoRo/LoLo container vessel built for Tropical Shipping & Construction Co. of Florida, and christened "Tropic Tide."

The Tropic Tide is the second vessel of this type built by SSE for Tropical, and the 397-foot ship was

delivered one and a half months ahead of the contracted schedule.

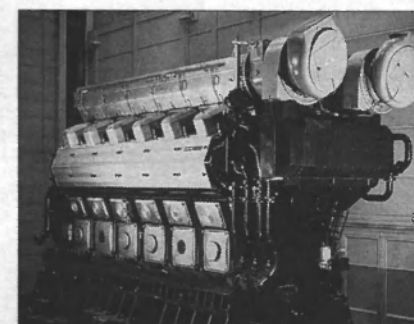
Driven by a pair of MaK type 9M 453C, four-stroke, non-reversible, turbo-charged and intercooled engines, through Lohmann & Stolterfoht Navilus reduction gears turning Lips controllable-pitch propellers, the vessel can attain speeds in excess of 15 knots. A Lips fixed-pitch propeller bow thruster aids propulsion. Onboard power is supplied with the help of a pair of Caterpillar type 3508 main diesel alter-

nators and a Caterpillar harbor diesel alternator.

Machinery onboard consists of: two O&K electro-hydraulic deck cranes; two Brattvag combined windlass/mooring/winch; and a MacGregor-Navire stern ramp.

The vessel, which will carry a crew of 18 in air-conditioned cabins, is also outfitted with: MarineProdukt steering gear; a full complement of Westfalia purifiers; an Alfa-Laval freshwater generator; and Raytheon radar.

Vasa 46 Engines Chosen For RCCL's New Cruise Vessels



The Vasa 46 engine.

GEC Alsthom Chantiers de l'Atlantique of France has ordered Wartsila Vasa 46 engines for the two luxury cruise vessels the yard is building for the Royal Caribbean Cruise Line (RCCL). The order comprises 10 12-cylinder engines with remote control systems and auxiliary equipment. Each vessel will have five 10,860 kW engines elastically mounted in a diesel/electric arrangement.

This first of the two 1,750-passenger vessels will enter service in the Caribbean during spring 1995, with the second scheduled for delivery a year later. The engines will be delivered by the Wartsila Diesel factory in Turku, Finland, at the end of 1993. Wartsila Diesel has previously supplied engines to the same shipowner for ships built in Finland and France.

Factors reportedly affecting the choice of the machinery were the Vasa 46's capability to meet the stringent NO_x and noise limitations set for the vessels, as well as the engines' output to space ratio.

With the latest order, more than 100 Wartsila Vasa 46 engines have been ordered since the launching of the product in 1987. More than 50 of these are for marine installations, including nine passenger vessels. For more information on Wartsila engines,

Circle 62 on Reader Service Card

Guillermo Hernandez Appointed As New Texaco Manager-Latin America

Guillermo Hernandez has been appointed Manager for Latin America, West Africa and Canada of Texaco Fuel, Marine & Marketing (TFMM). Mr. Hernandez will transfer to the company's executive offices in Harrison, N.Y., from Santiago, Chile, where he has served as Manager, Texaco Chile, S.A.C., since August 1991. In 1979, Mr. Hernandez joined Texaco Petroleum Company, Colombia, as a Marketing Assistant. In 1983, he was named Supervisor of the company's operations at Bogota El Dorado International Airport. He was appointed Assistant Marketing Supervisor in 1984, and in 1986 was promoted to the position of General Salesman.

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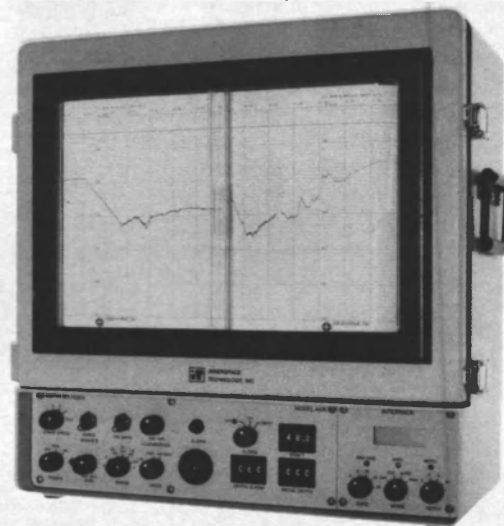
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Circle 325 on Reader Service Card



Drawing of the new car ferry to be built by Nichols Brothers.

Nichols Brothers To Build Elliott Bay-Designed Ferries For Pierce County, Wash.

A 213-foot, double-ended, steel car ferry will be built for Pierce County Public Works Department by Nichols Brothers Boat Builders, Inc., of Whidbey Island, Wash.

The 54-car ferry was designed by Elliott Bay Design Group of Seattle.

The ferry is expected to enter service in early 1994, serving Anderson and Ketron Islands from the mainland terminal at Steilacoom.

Matt Nichols, president of the boat building firm, said that his company is looking forward to constructing the auto ferry.

Nichols Brothers has built a number of outstanding passenger vessels in recent years.

Pierce County, which initiated ferry service in 1938, is one of three Washington State counties that operate their own vessels.

John Waterhouse, president of Elliott Bay, said that the increasing service demands in recent years have outstripped the ability of the county's primary ferry, the M/V Steilacoom, to provide adequate service. The 57-year-old ship has a 26-car capacity, while its backup boat, the wooden M/V Islander, is 12 years old and only carries 12 cars. Elliott Bay will act as the owner's agent during construction of the new ferry.

Mr. **Waterhouse** noted that "we were pleased to be selected to design the vessel for Pierce County. It has been particularly gratifying to work with the Department of Public Works to develop a vessel to meet Pierce County needs and design a vessel that meets United States Coast Guard (USCG) requirements for structural integrity, fire protection and life-saving provisions." The new ferry was designed to fix existing docking facilities.

The 92-gt vessel will have a beam of 66 feet and a draft of 10 feet.

Designed to operate with a crew of three, the Subchapter T vessel will be powered by a pair of 960-hp diesel engines rated at 348 shaft rpm and provide a service speed of 11 knots and a trial speed of 13 knots, according to designer estimates. The vessel will accommodate 250 passengers.

For more information about Nichols Brothers,

Circle 1 on Reader Service Card

June, 1993

House Subcommittee To Evaluate Canal Plan

In reaction to U.S. doubts over Panama's readiness to take over administration of the Canal in the year 2000, a House maritime subcommittee will visit the country this year to study the Panamanian Government's plans for the transition. U.S. officials have questioned whether President **Guillermo**

Endara's government is moving fast enough to prepare for operating the vital international waterway and to prevent the deterioration of canal facilities inherited by the country since the Panama Canal Treaty was signed in 1978. The subcommittee on Coast Guard and Navigation of the House Merchant Marine and Fisheries Committee has jurisdiction over the Panama Canal Commission, the U.S. entity responsible for operating the waterway.

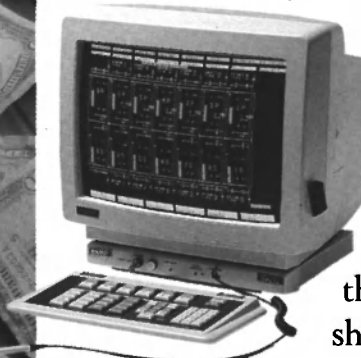


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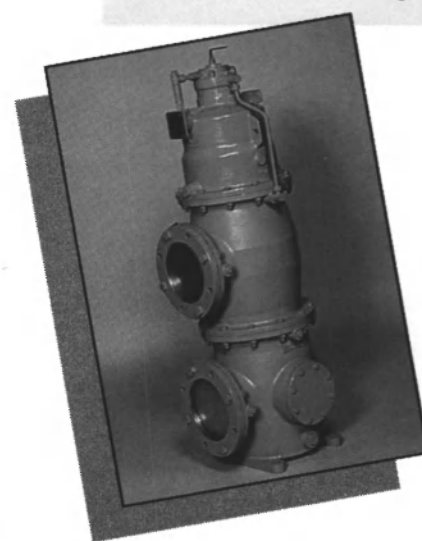
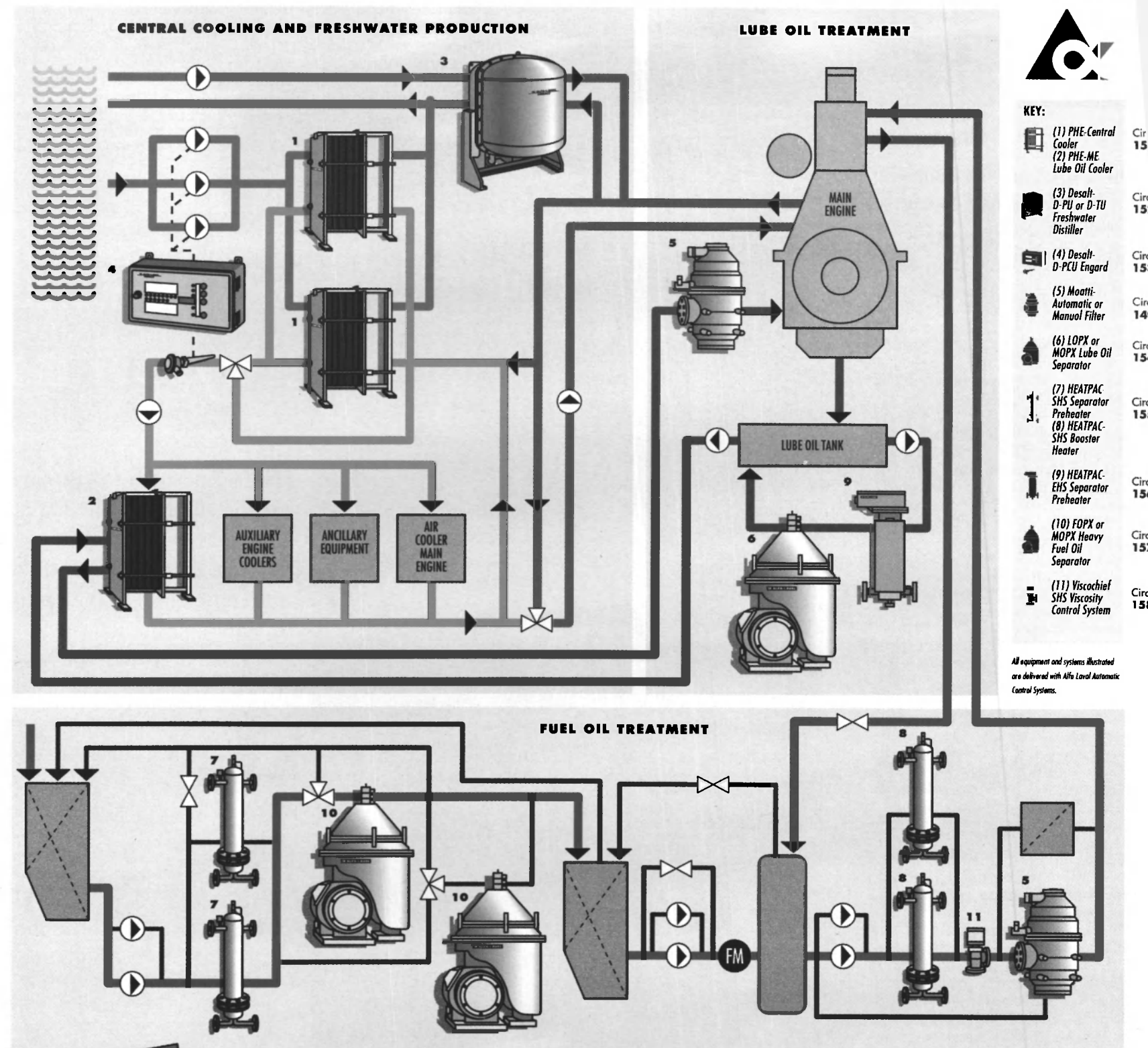
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Maritime Reporter/Engineering News

1993 SURVEY OF NEW VESSEL CONSTRUCTION

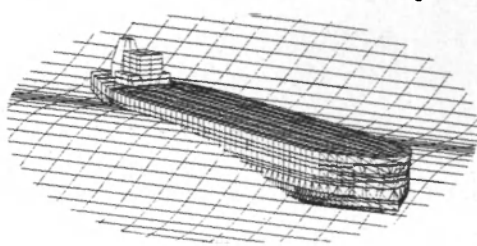
Statistics for this survey were compiled by the Maritime Reporter & Engineering News staff via a select survey of U.S. shipyards. While every effort has been made to ensure the survey is correct and complete, the publisher is not responsible for errors or omissions.

SHIPYARD	Dimensions (in feet)				Delivery
Vessel	Type	L x W x D	Main Engines	Owner/Operator	Date
Alabama Shipyard, Inc., P.O. Box 3201, (Dunlop Drive, Pinto Island), Mobile, Ala. 36652					
(8)	100-ton floating crane bridge	75 x 175 x 13	n/a	U.S. Navy	5/93 thru 12/93
	ASRM Barge	267 x 68 x 18	n/a	Lockheed	9/94
Atlantic Marine, Inc., 8500 Hecksher Drive, Jacksonville, Fla. 32226					
Amador	Ferry	130 x 45 x 6.25	Caterpillar	Naviera Tambor, S.A.	9/92
on Belle	Gaming	222 x 66 x 6.5	Caterpillar	Alton River Gambling	5/93
Artha's	Ferry	230 x 60 x 9.5	GM	Woods Hole, Martha's	11/93
nyard				Vineyard & Nantucket Steamship Authority	
mpress II	Gaming Vessel	238 x 66	n/a	Empress River Casino	11/93
Atlantic Marine, Inc., Mobile, P.O. Box 3202, Mobile, Ala. 36652					
(21)	Foreign Flag Vessels	Up to 797 x 137	Diesel/Steam	n/a	n/a
(7)	Foreign Flag Vessels	Up to 658 x 100	Diesel/Steam	n/a	n/a
(34)	U.S. Flag Vessels	Up to 946 x 105	Diesel/Steam	n/a	n/a
Avondale Industries, Inc., Boat Div., P.O. Box 100, Westwego, La. 70095					
	Towboat	168 x 45 x 12.5	Caterpillar	Viking Maritec	7/93
Avondale Industries, Inc., Shipyards, Div., P.O. Box 50280, New Orleans, La. 70150					
USS Guadalupe	TAO 200	678 x 98 x 50	Colt	U.S. Navy	9/92
Bath Iron Works Corp., 700 Washington St., Bath, Maine 04530					
Lake Erie	CG 70	567 x 55 x 31	GE	U.S. Navy	3/93
John Paul Jones	DDG 33	505 x 59 x 32	GE	U.S. Navy	8/93
Curtis Wilbur	DDG 54	505 x 59 x 32	GE	U.S. Navy	11/93
John S. McCain	DDG 56	505 x 59 x 32	GE	U.S. Navy	3/94
Laeon	DDG 58	505 x 59 x 32	GE	U.S. Navy	7/94
Paul Hamilton	DDG 60	505 x 59 x 32	GE	U.S. Navy	12/94
Fitzgerald	DDG 62	505 x 59 x 32	GE	U.S. Navy	4/95
Carney	DDG 64	505 x 59 x 32	GE	U.S. Navy	9/95
Gonzalez	DDG 66	505 x 59 x 32	GE	U.S. Navy	3/96
The Sullivane	DDG 68	505 x 59 x 32	GE	U.S. Navy	8/96
Hopper	DDG 70	505 x 59 x 32	GE	U.S. Navy	6/97
	DDG 72	505 x 59 x 32	GE	U.S. Navy	6/97
	DDG 73	505 x 59 x 32	GE	U.S. Navy	11/97
	DDG 75	505 x 59 x 32	GE	U.S. Navy	4/98
	DDG 76	505 x 59 x 32	GE	U.S. Navy	9/98
Bender Shipbuilding and Repair Co., Inc., 265 S. Water St., P.O. Box 42, Mobile, Ala 36601					
Al-Mutaheda 1	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	9/92
Al-Mutaheda 2	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	9/92
Bubiyah 5	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	Bubiyah Fisheries of Kuwait	10/92
Al-Mutaheda 3	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	10/92
Al-Mutaheda 4	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	11/92
Al-Mutaheda 5	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	11/92
Bubiyah 6	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	Bubiyah Fisheries of Kuwait	12/92
Al-Mutaheda 6	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	12/92
Al-Mutaheda 7	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	1/93
Al-Mutaheda 8	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	United Fisheries of Kuwait	1/93
Gulf Coast Responder	Oil Spill Recovery	210 x 45 x 17	Caterpillar	Marine Spill Response Corp.	2/93
Louisiana Responder	Oil Spill Recovery	210 x 45 x 17	Caterpillar	Marine Spill Response Corp.	4/93
Ensco VIII	Drill Barge	200 x 85 x 14	n/a	ENSCO	3/93
Ensco X	Drill Barge	200 x 85 x 14	n/a	ENSCO	3/93
SHIPYARD					
Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date
Bubiyah 7	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	Bubiyah Fisheries of Kuwait	n/a
Bubiyah 8	Shrimp Trawler	83 x 24 x 11.5	Caterpillar	Bubiyah Fisheries of Kuwait	n/a
BethShip-Sabine Yard, 2500 Martin Luther King Dr., P.O. Box 1448, Port Arthur, Texas 77641					
Lykes Innovator	n/a	n/a	n/a	Lykes Lines	7/92
American Reservist	n/a	n/a	n/a	Aframs Shipping	8/92
Zane Barnes	n/a	n/a	n/a	Reading & Bates	11/92
Mexico	n/a	n/a	n/a	Perforadora Mexico	1/93
Cliff Rig 8& 10	n/a	n/a	n/a	Cliffs Drilling	2/93
Colorado	n/a	n/a	n/a	Sabine Transportation	3/93
Merkur Africa	n/a	n/a	n/a	Rohden Schiffsbetriebe	3/93
Bright Sprout	n/a	n/a	n/a	Fuyo Kouin	3/93
Florida Express	n/a	n/a	n/a	Tortugas Shipping	4/93
Stolt Resolute	n/a	n/a	n/a	Stolt-Nielsen	4/93
Hercules 20	n/a	n/a	n/a	Hercules Offshore	4/93
Thekwini	n/a	n/a	n/a	Hudson Steamship	4/93
Blount Industries, Inc., 461 Water St., Warren, R.I. 02885-0368					
Hull 288	Tour Boat	33.5 x 12 x 3.5	Mercury	Blackstone Valley	5/93
Hull 290	Ferry	132.5 x 32.5 x 15	Cummins	Circle Line	5/93
Niagara Prince	Passenger/Cruise	166 x 40 x 6	MAN	American Canadian Caribbean Line	4/94
Bollinger Quick Repair, P.O. Box 116, 615 Destrahan Ave., Harvey, La. 70059					
Feliciana	Ferry	97 x 36 x 8	Cummins	State of Louisiana	1/93
Iberville	Ferry	97 x 36 x 8	GM	State of Louisiana	3/93
Ascension	Ferry	154 x 60 x 11	Caterpillar	State of Louisiana	2/93
	Dredge	120 x 45 x 7	n/a	Bean	4/93
Bollinger Machine Shop & Shipyard, Inc., P.O. Box 250, Lockport, La. 70374					
(13)	Cyclone Class Vessels	170 x 24 x 13	Paxman	U.S. Navy	2/93 to 3/95
(18)	RIB's	33 x 10.5 x 2.5	Cummins	U.S. Navy	10/93 to 6/94
Breaux's Bay Craft, Inc., P.O. Box 306, 7810 Danielle Road, Loreauville, La. 70552					
High Sheriff	Patrol	40 x 14	Detroit Diesel	Vermillion Parish Sheriff	2/93
Mexico III	Passenger	146 x 30	DDEC	CMC	4/93
n/a	Dive Boat	43 x 15	John Deere	n/a	7/93
n/a	Pilot	50 x 15	Detroit Diesel	Pascagoula Pilots	9/93
n/a	Supply/Crew	152 x 30	Caterpillar	Crewboats, Inc.	10/93
Campbell Industries, P.O. Box 1870, San Diego, Calif. 92112					
	Motor Yacht	217 x 38 x 27	Deutz	Actaeon Shipping Ltd.	10/94
Conrad Industries, P.O. Box 790, Morgan City, La. 70381					
	Deck Barge	220 x 54 x 14	n/a	Commercial	6/92
	Deck Barge	150 x 50 x 9	n/a	Commercial	7/92
	Deck Barge	120 x 50 x 8	n/a	Commercial	8/92
	Drydock	90 x 46 x 5	n/a	Commercial	1/93
	Deck Barge	180 x 64 x 12	n/a	Commercial	11/92
(3)	Deck Barges	120 x 45 x 7	n/a	Commercial	11/92 to 2/93
	Deck Barge	120 x 50 x 7	n/a	Commercial	2/93
	Deck Barge	140 x 45 x 7	n/a	Commercial	2/93

1993 SURVEY OF NEW VESSEL CONSTRUCTION (Continued)

SHIPYARD						SHIPYARD					
Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date	Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Deliv Date
Corn Island Shipyard, Box 125, Lamar, Ind. 47579						Freeport Shipbuilding & Marine Repair, P.O. Box 417, Freeport, Fla. 32439					
	Crane Barge	110 x 52 x 7	n/a	n/a	7/92	Barefoot Princess	Passenger	65 x 26	Caterpillar	Charleston Paddlewheel	6/
	Crane Barge	120 x 45 x 6.5	n/a	n/a	10/92	Island Spirit	Sport Fishing	65 x 20	Volvo	McKeithen Outdoor	3/
	Material Barge	150 x 32 x 8	n/a	n/a	1/93	Lady Anderson	Passenger	130 x 32	Caterpillar	Capt. Anderson Cruises	5/
	Material Barge	150 x 32 x 8	n/a	n/a	3/93	n/a	n/a	65 x 26	Cummins	Riverhead Renaissance	4/
	Crane Barge	150 x 52 x 9	n/a	n/a	5/93						
	(2) Material Barges	195 x 35 x 9.5	n/a	n/a	7/93						
	Crane Barge	110 x 52 x 7.5	n/a	n/a	8/93						
Derecktor Shipyards, 311 E. Boston Post Road, Mamaroneck, N.Y. 10543						Gladding-Hearn Shipbuilding, 1 Riverside Ave., Somerset, Mass. 02725					
Mit Sea Ah	Motor Yacht	114 x 23 x 6.5	MTU	American	5/93	Kevin C. Kane	Cat Ferry	52 x 16	Detroit Diesel	NYC Fire Dept.	11/
The Boat III	Portfish	66 x 17.75 x 5.5	MTU	American	2/94	P-282	Pilot Boat	67 x 20	Caterpillar	San Francisco Pilots	7/9
						Henry Hudson	Ferry	97 x 25	Caterpillar	Port Imperial Ferry	12/9
						P-286	Ferry	97 x 25	Caterpillar	Port Imperial Ferry	3/9
						P-287	Police Boat	36 x 12	Detroit Diesel	NYC Police Dept.	3/9
						R-288	Research Vessel	50 x 16	Detroit Diesel	University of N.H.	6/9
Eastern Shipyards, 2200 Nelson St., P.O. Box 960, Panama City, Fla. 32402						Gulf Coast Fabrication, Inc., P.O. Box 539, Lakeshore, Miss. 39558					
Europa Sky	Dinner/Casino	160 x 36 x 14.5	Caterpillar	Europasky Corp.	4/93	Dump Scow		235 x 45 x 20	n/a	Great Lakes Dredge	9/9
						Offshore Deck Barge		290 x 90 x 19	n/a	Tidewater	11/9

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1993 SURVEY OF NEW VESSEL CONSTRUCTION (Continued)

YARD						SHIPYARD					
.el	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date	Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date
	Oil Tank Barge	385 x 56 x 26	n/a	Penn Maritime	12/92	Arctic Baruna II	Stern Trawler	112 x 30 x 15	Cummins	Arctic Alaska Fisheries	3/93
	Dump Scow	235 x 45 x 20	n/a	Great Lakes Dredge	12/92						
	Pipeline Barge	290 x 72 x 22	n/a	Subsea Intl.	1/93						
	Deck Barge	300 x 110 x 10	n/a	Mardi Gras Casino Mag	2/93						
	Deck/Container Barge	250 x 80 x 16	n/a	Turecamo Maritime	4/93						
	Oil Barge	430 x 105 x 43	n/a	August Trading	6/93						
	Deck Barge	300 x 110 x 10	n/a	Gold Coast	6/93						
	Deck Barge	300 x 110 x 10	n/a	Bay Vessels	7/93						
	Rail Car Barge	400 x 78 x 21	n/a	Ketchikan Pulp Co.	9/93						
Jeff Craft Inc., 3904 Highway 182, Patterson, LA 70392											
	ss Lolly	Crewboat	45 x 14 x 3	Detroit Diesel	Crescent Ship Service	7/92					
	r. Freddie	Crewboat	45 x 14 x 3	Detroit Diesel	Crescent Ship Service	9/92					
	mmalco	Crewboat	100 x 23 x 6	Caterpillar	Lamnalco	10/92					
	azelle	Crewboat	100 x 23 x 6	Caterpillar	Lamnalco	10/92					
	mmalco	Crewboat	100 x 23 x 6	Caterpillar	Lamnalco	10/92					
	npala	Crewboat	100 x 23 x 6	Caterpillar	Lamnalco	10/92					
	tr. Doc	Utility	65 x 24 x 5	Detroit Diesel	Crescent Ship	12/92					
	oliet	Ferry	65 x 22 x 5	Cummins	Mackinaw Lakeshore	4/93					
	Oil Cross	Crewboat	100 x 23 x 6	Caterpillar	O.I.L.	4/93					
	Oil Calabar	Crewboat	100 x 23 x 6	Caterpillar	O.I.L.	5/93					
	Spirit of Harbor	Dinner Cruise	73 x 22 x 6	Detroit Diesel	S&M	5/93					
	town	Pleasure	90 x 25 x 6	MTU	Private	7/93					
	Chansaheb	Crewboat	100 x 23 x 6	Caterpillar	Texas Petroleum	8/93					
	M/N Wayuu	Crewboat	100 x 23 x 6	Caterpillar	Texas Petroleum	8/93					
Homeport Marine, 5807 Elder Ferry Road, Moss Point, Miss. 39562-8920											
	Arctic VI	Stern Trawler	124 x 30 x 15	Caterpillar	Arctic Alaska Fisheries	12/92					
	Arctic Baruna I	Stern Trawler	112 x 30 x 15	Cummins	Arctic Alaska Fisheries	2/93					
Houma Fabricators, a div. of L.O.R., Inc., 1100 Oak St., Houma, La. 70363											
	Vermont	Ferry	196 x 37 x 12	Caterpillar	n/a	12/92					
	Voith Tractor Tug	Tug	98 x 46 x 12	MAN B&W	n/a	12/93					
	Tank Barge	Tank Barge	164 x 46 x 10	n/a	n/a	12/93					
	(3) Casino Paddlewheel Boats	Paddlewheel Boats	292 x 74 x 13	Cummins	n/a	2/94 to 8/94					
Jeffboat, Inc., 1030 E. Market St., Jeffersonville, Ind. 47130											
	(2)	Double Skin Tank Barges (DSTB)	297 x 54 x 13	n/a	n/a	6/92					
	(6)	DSTB	200 x 35 x 12	n/a	n/a	8/92					
	(2)	Open Hopper Barges (OHB)	200 x 35 x 12	n/a	n/a	8/92					
	(10)	DSTB	240 x 54 x 12	n/a	n/a	6/92 to 12/92					
		DSTB	195 x 35 x 12	n/a	n/a	6/92					
	(24) OHB	200 x 35 x 13	n/a	n/a	9/92						
	(3)	DSTB	195 x 35 x 13	n/a	n/a	1/93					
	(15)	OHB	200 x 35 x 12	n/a	n/a	1/93					
		DSTB	150 x 54 x 12	n/a	n/a	10/92					
Kvichak Marine Industries, 615 N. 34th St., Seattle, Wash. 98103											
	Utility Skiff	18 x 8.5 x 1	Yamaha	n/a	7/92						
	Oil Spill Response	32 x 11.5 x 1.5	Kodiak	Riedel Environmental	10/92						
	(3) Gillnetters	32 x 13.5 x 3	Lugger	n/a	2/93						
	Lady Kate	Gillnetter	32 x 13.5 x 3	MAN	n/a	2/93					

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1993 SURVEY OF NEW VESSEL CONSTRUCTION (Continued)

SHIPYARD						SHIPYARD					
Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date	Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Deliv I
(2)	Gillnetters Oil Spill Response	32 x 13.5 x 3 32.5 x 11.5 x 1.5	Lugger Star Power	n/a Clean Sound Coop.	3/93		Ramp Barge	40 x 14 x 4	n/a	Escape Marine	
Houma Fabricators, a division of L.O.R., Inc., 1100 Oak St., Houma, La. 70363						Marinette Marine Corp., Foot of Ely St., Marinette, Wis. 54143					
Vermont	Ferry	196 x 37 x 12	Caterpillar	n/a	12/92	USCGC Juniper	Buoy Tender	225 x 46	n/a	U.S. Coast Guard	15
	Voith Tractor Tug	98 x 46 x 12	MAN B&W	n/a	12/93		Dredge Pipeline				
	Tank Barge	164 x 46 x 10	n/a	n/a	12/93		Pontoon System	78 x 20	n/a	Corps of Engineers	5/
(3) Casino Paddlewheel Boats		292 x 74 x 13	Cummins	n/a	2/94 to 8/94	Master Boat Builders Inc., P.O. Box 702, Bayou LaBatre, Ala. 36509					
Jeffboat, Inc., 1030 E. Market St., Jeffersonville, Ind. 47130						(8)	Fishing Vessels	85 x 24 x 12.5	Caterpillar	n/a	8/92 to 11/93
						Capt. Phillip	Fishing Vessel	86 x 24 x 12.5	Caterpillar	n/a	4/93
						Dona Marcella	Fishing Vessel	80 x 22 x 12	Caterpillar	n/a	4/93
						Capt. David	Fishing Vessel	90 x 24 x 12.5	Caterpillar	n/a	4/93
						Miss Anna V.	Fishing Vessel	92 x 25 x 12.5	Caterpillar	n/a	5/93
						Miss Lorie II	Fishing Vessel	82 x 22 x 12	n/a	n/a	5/93
						Master Marine, Inc., P.O. Box 665, 14284 Shell Belt Road, Bayou La Batre, Ala., 36509					
						Gretna	Hydro Survey Shrimp Trawler	49 (L) 85 x 24	GM Caterpillar	Corps of Engineers Gulf of Mexico	8/93 9/93
						Maxon Marine, Inc., S. Boundry St., Tell City, Ind. 47586					
							Tank Barges	200 x 35 x 12	n/a	n/a	1992
							Deck Barges	200 x 40 x 10	n/a	n/a	1992
							Sand Barges	130 x 30 x 7	n/a	n/a	1993
							Crane Barges	190 x 40 x 7	n/a	n/a	1993
							Dredge Hull	150 x 30 x 6	n/a	n/a	1993
							Crane Barge	200 x 60 x 12	n/a	n/a	1993
Kvichak Marine Industries, 615 N. 34th St., Seattle, Wash. 98103						McDermott Incorporated, Shipyard Division, P.O. Box 588, 735 Degraeve Road, Amelia, La. 70340					
	Utility Skiff	18 x 8.5 x 1	Yamaha	n/a	7/92	Karlissa 'A'	Jack-up Barge	170 x 80 x 13	n/a	Laing/GTM, J.V.	6/92
(3)	Oil Spill Response	32 x 11.5 x 1.5	Kodiak	Riedel Environmental	10/92	Karlissa 'B'	Jack-up Barge	170 x 80 x 13	n/a	Laing/GTM, J.V.	6/92
Lady Kate	Gillnetters	32 x 13.5 x 3	Lugger	n/a	2/93	Tagos 20	SWATH				
(2)	Gillnetter	32 x 13.5 x 3	MAN	n/a	2/93		Surveillance	234 x 90 x 45	Caterpillar	Military Sealift Comd.	7/92
	Gillnetters	32 x 13.5 x 3	Lugger	n/a	3/93	W.K. McWilliams	Sulphur Carrier	400 x 72 x 25	Caterpillar	Freeport McMoran R.P.	10/92
	Oil Spill Response	32.5 x 11.5 x 1.5	Star Power	Clean Sound Coop.	3/93	El Enron II	Power Gener- ation Barge	257 x 76 x 14	Wartsila	Wartsila Diesel, Inc.	11/92
Leevac Shipyards, P.O. Box 1190, Highway 90 East, Jennings, La. 70546							" "	257 x 76 x 14	Wartsila	Wartsila Diesel, Inc.	12/92
	Gaming Vessel	280 x 63 x 10.5	Caterpillar	President Riverboat	6/92	El Enron 1	SWATH				
	Gaming Vessel	210 x 62 x 11	MTU	Players Riverboat Casino	1/93	Tagos 21	Surveillance	234 x 90 x 48	Caterpillar	Military Sealift Comd.	1/93
	Gaming Vessel	350 x 63 x 11	Caterpillar	President Riverboat	11/93	Gail Candies	Tank Barge	286 x 60 x 26.5	n/a	Otto Candles, Inc.	n/a
Marco Inc., 2300 W. Commodore Way, Seattle, Wa. 98199						Tagos 22	SWATH				
Plover	Spill Recovery	40 x 14.5 x 3.5	Perkins	Clean Sound Coop.	6/92		Surveillance	234 x 90 x 45	Caterpillar	Military Sealift Comd.	7/93
Marine Builders, Inc., 208 W. Church St., Utica, Ind. 47130						Unnamed	Sulphur Carrier	524 x 90 x 49	Wartsila	Sulphur Carriers, Inc.	8/94
600-ton Hour Suction Dredge		187 x 35 x 6	Cummins	Delta Material	4/93	American Queen	Passenger Vessel	418 x 85 x 13.5	Caterpillar	Delta Queen Steamboat	2/95
Marine Inland Fabricators, 1725 Buchanan St., Panama City, Fla. 32409						Munson Mfg., 150 W. Dayton, Edmonds, Wa. 98020					
Line Handling Boat	25 x 10 x 3.5	GM	Coastal Bend & Mooring	7/92	(5)	Patrol	25 x 8	n/a	State of Calif.	2/93	
(4) Sectional Barges	40 x 10 x 4	n/a	Custom Dock & Davit	7/92	(20)	Oil Skimmers	20 x 10	n/a	Alyeska	3/93	
(4) Sectional Barges	40 x 10 x 4	n/a	Walter Tobee Const.	7/92		Aid To Navigate	18 x 7	n/a	USCG	3/93	
(2) Sectional Barges	28 x 8 x 3	n/a	Digital Products	7/92		Crewboat	25 x 8	n/a	Panama Canal	4/93	
Workboat	25 x 10 x 3.5	GM	Titon Marine	12/92		Hydrographic	26 x 10	n/a	n/a	5/93	
Workboat	25 x 14 x 4.5	GM	CIESA		National Steel & Shipbuilding Company (NASSCO), P.O. Box 85278, San Diego, Calif. 92138-5278						
Dredge Tender	40 x 16 x 4.5	GM	Dupont Corp.	12/92	R.J. Pfeiffer	Container Ship	713 x 105 x 35	MAN B&W	Matson Navigation	8/92	
Ferry	25 x 14 x 4.5	GM	O&H Land Company	2/93	(4)	AOE Fast Combat Ships	754 x 107 x 38	GE	U.S. Navy	1993 to 1997	
Workboat	20 x 8 x 3	n/a	Balfour Beatty	4/93	Newpark Shipbuilding & Repair, Inc., 8502 Cypress St., Houston, Texas 77012						
(2) Sectional Barges	40 x 8 x 3	n/a	Kelco Const. Co.	3/93							
Portable Dredge Section	40 x 7.5	n/a	Dredge & Marine Corp.	n/a							
Portable Dredge Section	27 x 8.5	n/a	San Diego Gas & Electric	n/a							
Workboat	34 x 14.5 x 4.5	GM	T.A. Loving	n/a							
Workboat	25 x 10 x 4	GM	James Miller Marine	n/a							

S. Yard Survey (Continued)

SHIPYARD						SHIPYARD							
Vessel		Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date	Vessel		Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	Delivery Date
si I	Deck Barge		120 x 40 x 7.5	n/a	Newpark Environmental	11/92	M/V						
si II	Deck Barge		110 x 40 x 7.5	n/a	" "	5/93	Wm. Market Ferry			96 x 38.5 x 5.5	Caterpillar	Miller Boat Lines	4/93
chols Brothers Boatbuilders, 5400 S. Cameron Road, Freeland, Wa. 98249							(5) PCF 9201-9205			51 x 15 x 4	Detroit Diesel	U.S. Navy	1993
							(7) Landing Craft, Personnel Large			36 x 12 x 3.5	Detroit Diesel	U.S. Navy	3 Boats - 1993 4 Boats - 1994
	Pontoon Boat		65 x 27 x 6	n/a	Lake Tahoe Cruises	6/92	Platzter Shipyard, Inc. P.O. Box 24399, Houston, Texas 77229						
	Catamaran		80 x 29 x 5.5	Lugger	Alaska Dive Boat	12/92							
	Swath Vessel		122 x 59 x 12	Textron Lycoming	Martin Automatic, U.K.	3/94							
	Catamaran		95	Detroit Diesel	City of Alameda, Calif.	3/94							
range Shipbuilding Co. Inc., P.O. Box 1670, 710 Market St., range, Texas 77630							(3) Barge			205 x 53 x 13	n/a	n/a	4/93
							Barges			297 x 54 x 12	n/a	n/a	2/93 to 10/93
Quality Shipyards, Inc., P.O. Box 1817, Houma, La. 70361													
	OPDS #5		150 x 54 x 12	none	U.S. Navy	7/92	Lloyd Tide	Utility		121 x 26 x 10	GM	Tidewater	6/92
	Yon 311		185 x 35 x 13	GM	U.S. Navy	6/93	Brazos River	Supply		180 x 40 x 14	EMD	Hadi-H. Al-Hamman	9/92
	Yon 312		185 x 35 x 13	GM	U.S. Navy	6/93	Maridive 55	Supply		194 x 40 x 15	EMD	Maridive Oil Services	10/92
	Yon 313		185 x 35 x 13	GM	U.S. Navy	8/93	Valiant						
	OPDS #6		150 x 54 x 12	None	U.S. Navy	9/93	Seahorse	Supply		180 x 40 x 14	EMD	Hadi-H. Al-Hamman	10/92
	Yon 314		185 x 35 x 13	GM	U.S. Navy	2/94	Seacor Osprey	Supply/					
	Yon 315		185 x 35 x 13	GM	U.S. Navy	2/94	Spill Response			180 x 40 x 14	Wichman	Seacor Marine	11/92
	Yon 316		185 x 35 x 13	GM	U.S. Navy	4/94	Jan Tide	Supply		194 x 40 x 14	Caterpillar	Tidewater	12/92
	Yon 317		185 x 35 x 13	GM	U.S. Navy	4/94	Gulf Gale	Tug		111 x 30 x 16	EMD	Tidewater	1/93
	Push Boat		59 x 22 x 8.5	n/a	Corps of Engineers	11/94	Jackie Chouest	Supply		220 x 42 x 16	EMD	Chouest	2/93
	Push Boat		59 x 22 x 8.5	n/a	Corps of Engineers	3/95	Randy Eckstein	Towboat		166 x 45 x 11	Caterpillar	Iowa Fleetng	2/93
Patti Shipyard, Inc., P.O. Box 271, Pensacola, Fla. 32592							Weatherbird II	Research		115 x 28 x 10	Caterpillar	Bermuda Biological	4/93
	Reynolds Drift Collector		60 x 22	Cummins	Corps of Engineers	1/93	Gist Tide	Supply		192 x 40 x 15	EMD	Tidewater	4/93
	Casino Queen		445.5 x 69	Cummins	Casino Queen	3/93	Landry Tide	Supply		180 x 40 x 14	EMD	Tidewater	4/93
	Service Barge		150 x 52	n/a	Corps of Engineers	10/93	SeaArk Marine, P.O. Box 210, Monticello, Ark. 71655						
	Quarters Barge		266 x 40	n/a	Corps of Engineers	4/94	Transport Boat			24 x 8	Mercruiser	n/a	8/92
Peterson Builders, Inc., 101 Pennsylvania St., P.O. Box 650, Sturgeon Bay, Wis. 54235							Aids To Navigation			23 x 8	Volvo	U.S. Government	8/92
	Pioneer	MCM-9	224 x 39 x 11	Isotta Fraschini Hansome Elec.	U.S. Navy	8/92	Patrol Boat			20 x 7	OMC	Dept. Fish of Wildlife	8/92
	Warrior	MCM-10	"	"	"	12/92	Hull AO 334			24 x 8	n/a	Corps of Engineers	9/92
	Gladiator	MCM-11	"	"	"	6/93	Hull AO 365			21	OMC	n/a	11/92
	Ardent	MCM-12	"	"	"	8/93	Transport Boat			24 x 8	OMC	EPA	11/92
	Dextrous	MCM-13	"	"	"	12/93	(4) Aids To Navigation			21	OMC	U.S.C.G.	11/92
	Chief	MCM-14	"	"	"	7/94	Hull AO 397			18	OMC	National Park Service	11/92
							Hull AO 398			20 x 8.5	n/a	U.S. Government	12/92
							Hull AO 361			20	OMC	U.S. Government	12/92
							Hull AO 404			24 x 7	n/a	n/a	12/92
							(4) Aids To Navigation			21 x 8	OMC	U.S.C.G.	12/92

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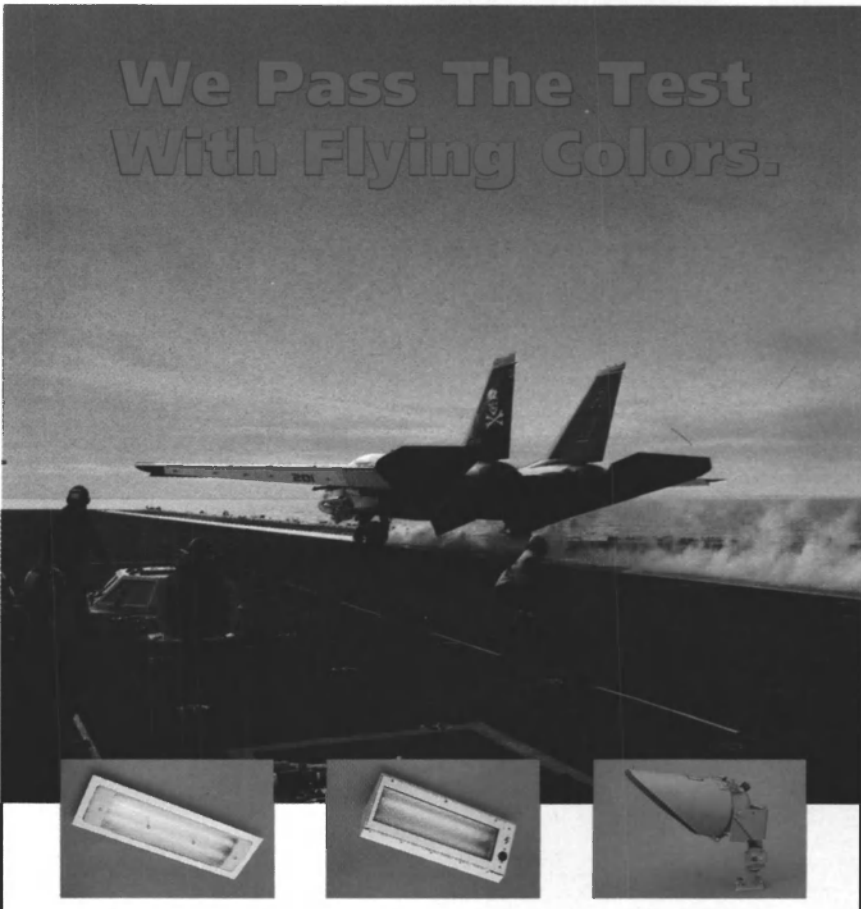
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U.S. Yard Survey (Continued)

SHIPYARD					Delivery Date
Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	
	Cargo Boat Survey Boat	24 x 7 40 x 13	n/a Detroit Diesel	National Park Service Corps of Engineers	12/92 2/93
Sea-Fab, Inc., 4111 Cedar St., Pascagoula, Miss. 39567					
	Two (2) Spill Response	100 x 28	Caterpillar	Clean Coastal Waters	8/92
Service Marine Industries, P.O. Box 3606, Morgan City, La. 70381					
Odyssey II	Dinner	200 x 40 x 8	Cummins	Premier Yachts	4/93
Northern Star	Gaming Vessel	210 x 67 x 8	Caterpillar	Harrah's	4/93
Southern Star	Gaming Vessel	210 x 78 x 8	Caterpillar	Harrah's	9/93
SkipperLiner Industries, 621 Park Plaza Dr., La Crosse, Wis. 54601					
Water's Edge	Dinner	80 x 18	Cummins	Water's Edge Restaurant	9/92
Island Girl	n/a	84 x 18	Cummins	Avion Yachts	12/92
n/a	n/a	64 x 18	Cummins	St. Croix Cruises	4/93
Falcon I	n/a	64 x 17	Caterpillar	Choice, Inc.	5/93
M.S. Dixie II	n/a	135 x 33	Caterpillar	Travel Systems Ltd.	n/a
Southwest Marine, Inc., Foot of Sampson St., P.O. Box 13308, San Diego, Calif. 92170					
Nuevo Pemex I	n/a	662 x 93 x 58	Sulzer	Pemex	11/92
Fair Princess	n/a	608 x 80 x 46	John Brown	P&O	1/93


SHIPYARD					Delivery Date
Vessel	Type	Dimensions (in feet) L x W x D	Main Engines	Owner/Operator	
Steiner Shipyard, Inc., P.O. Box 742, Bayou La Batre, Ala. 36509					
Conquistadora	Ferry	105 x 24 x 9.5	Caterpillar	Puerto Rico Ports Auth.	1/93
n/a	Debris Collector	40 x 18	Cummins	Puerto Rico Ports Auth.	2/93
Safety Leader	Fish Boat	66 x 24 x 7.5	Caterpillar	n/a	5/93
Aucosisco	Oil Recovery	140 x 37.5 x 10	n/a	Maine Dept. of Environ.	5/93
Ketepensit	Oil Recovery	140 x 37.5 x 10	n/a	Maine Dept. of Environ.	5/93
Casino/Gaming Vessel		185 x 38 x 14	Caterpillar	n/a	6/93
Passenger/Ferry		152 x 42 x 8	Caterpillar	n/a	1/93
Superior Boat Works, P.O. Box 8, Greenville, Miss. 38702					
Lady Luck					
Natchez	Gaming Vessel	302 x 66 x 12	n/a	Lady Luck Casino/Hotel	2/93
Cactus Pete	Gaming Vessel	300 x 104 x 12	n/a	Cactus Pete	n/c
Lady Luck					
Tunica	Gaming Vessel	324 x 80 x 12	n/a	Lady Luck Casino/Hotel	n/c
SWATH Ocean Systems, 979 G Street, Chula Vista, Calif. 92011					
Pilot Vessel		67 x 32	Caterpillar	Houston Pilots	4/93
Oceanographic Research		117 x 53	Caterpillar	n/a	n/a
Sport Fishing		90 x 45	Caterpillar	n/a	n/a

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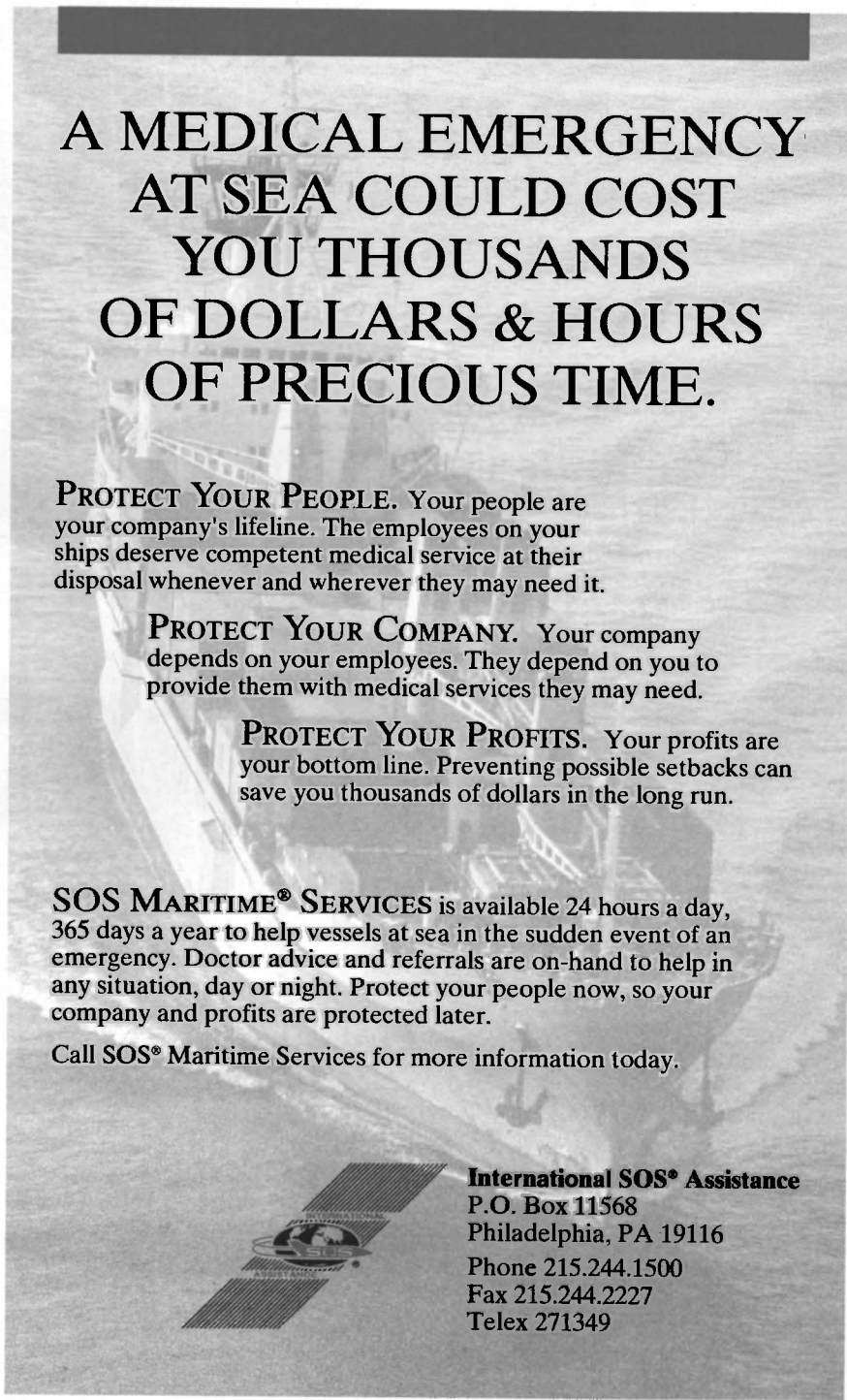
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U.S. Yard Survey (Continued)

SHIPYARD		Dimensions (in feet)	Main Engines	Owner/Operator	Delivery Date
Vessel	Type	L x W x D			
Swiftships, Inc., P.O. Box 1908, Morgan City, La. 70380					
(7) Landing Craft (Mech)		74	n/a	U.S. Navy	7/92 to 2/93
(5) Riverine Patrol Boats		45	n/a	U.S. Navy	9/92 to 1/93
(8) Riverine Assault Craft		35	n/a	U.S. Marine Corps	n/a
(2) Route Survey Vessels		90	n/a	Arab Republic of Egypt	n/a
(3) Coastal Mine Hunters		110	n/a	Arab Republic of Egypt	n/a

SHIPYARD		Dimensions (in feet)	Main Engines	Owner/Operator	Delivery Date
Vessel	Type	L x W x D			
Tidewater Equipment Corp., P.O. Box 57, Norfolk, Va. 23501					
	Deck Barge	180 x 36 x 9	n/a	n/a	7/92
(2)	Ocean Service Split Hull Hopper Barges	250 x 54 x 21	n/a	n/a	n/a
Trinity Marine Group, Trinity Industries, Inc., P.O. Box 3029, Gulfport, Miss. 39505 (The following encapsulates activity at all 10 of TMG's yards)					

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- Enclosed gears
- Unique automatic load activated brake
- Four sizes—150LB - 1,100LB line pull capacities

WGCF SERIES

- Center flange to separate the two ropes on the drum
- Two speed on larger models
- Tough cast construction with steel frame
- Removable handcrank—even under load
- Unique automatic load activated brake
- Five sizes—1,100LB - 11,000LB line pull capacities

WG SERIES

- Tough and rugged for continuous heavy duty use
- Two speed on larger models
- Removable handcrank—even under load
- Unique automatic load activated brake
- High rope/drum ratios for maximum rope life
- Six sizes—550LB - 11,000LB line pull capacities

CFF SERIES

- Controlled free fall
- Double braking system—completely automatic. One centrifugal dynamic brake to prevent over speed, one automatic load activated brake to hold load in any position.
- Totally enclosed gears for use in adverse conditions
- High rope/drum ratios for maximum rope life
- Four sizes—660LB - 3,300LB line pull capacities

WGC SERIES

- Chainwheel operated for use in inaccessible locations
- Forty feet of chain as standard
- Large diameter wheel for ease of operation
- Unique automatic load activated brake
- This chain wheel option can also be supplied with the WGCF series
- Six sizes available—550LB - 11,000LB

WSG SERIES

- Totally enclosed gears permanently lubricated for use in hostile environments
- High drum/rope ratios for maximum rope life
- Tough all cast construction
- Removable handcrank—even under load
- Unique automatic load activated brake
- Three sizes—550LB - 1,650LB line pull capacities

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SHIPYARD		Dimensions (in feet)		Main Engines	Owner/Operator	Delivery Date
Vessel	Type	L x W x D				
Yard 81 – Moss Point Marine						
(10)	Landing Craft Utility	174 x 42	Cummins	U.S. Army	2/92 to 9/92	
	Ocean Tug	127 x 37	EMD	n/a	4/92	
(2)	Oil Spill Response	208 x 44	Caterpillar	M.S.R.C.	10/92 to 5/93	
(6)	Logistic Support Vessel	208 x 44	EMD	U.S. Army	5/93 and 8/93	
(6)	Large Tugs	128 x 36	EMD	U.S. Army	8/93 to 1/94	
	Ocean tug	127 x 37	EMD	n/a	2/94	
Yard 86 -- Halter Moss Point						
	Dustpan Dredge	300 x 58	Ulstien	U.S. Army C.O.E.	6/93	
	Inland Towboat	250 x 58	Caterpillar	U.S. Army C.O.E.	1/93	
(3)	Oceanographic Survey	329 x 58	UPS	U.S. Navy	1/94 to 11/95	
	Oceanographic Research	273 x 52		GE	U.S. Navy	
5/98						
Yard 84 – Halter Lockport						
(5)	Oil Spill Response	208 x 44	Caterpillar	M.S.R.C.	11/92 to 4/93	
	Tug/Supply Vessel	218 x 46	Caterpillar	n/a	8/93	
(4)	Asphalt Barge	297 x 54	Caterpillar	n/a	1/93 to 8/93	
(2)	Tractor Tugs	155 x 46	EMD	n/a	11/93 to 1/94	
Yard 82 -- Aluminum Boats						
(3)	Pilot Launch	53 x 15	GM	Panama Canal Comm.	9/92	
	Catamaran	100 x 33	Caterpillar	n/a	10/92	

SHIPYARD		Dimensions (in feet)		Main Engines	Owner/Operator	Delivery Date
Vessel	Type	L x W x D				
	Excursion	90 x 26	Cummins	n/a	12/92	
	Crew Utility	135 x 28	GM	n/a	10/92	
	Dinner Cruise	143 x 28	GM	n/a	4/93	
	Crew Utility	135 x 28	GM	n/a	6/93	
	Pilot Launch	53 x 15	GM	Panama Canal Comm.	2/93	
	Patrol Boat	53 x 15	GM	Corps of Engineers	1/94	
	Pilot Launch	53 x 15	GM	Panama Canal Commi.	5/93	
(2)	Crew Utility	135 x 28	GM	n/a	8/93 and 10/93	
Yard 85 – Equitable, New Orleans						
(12)	Coastal Patrol Boats	78 x 20	GM	U.S. Navy	1/92 to 11/92	
	Excursion Vessel	90 x 26	Cummins	n/a	12/92	
	Sport Fishing Yacht	72 x 20	GM	n/a	2/93	
(2)	Tow Boats	85 x 30	Caterpillar	U.S. Army C.O.E.	1/94	
	Cargo Barge	180 x 54	n/a	n/a	6/93	
(3)	Patrol Boats	82 x 18	GM	n/a	8/93 to 12/93	
Yard 37 – Gretna Machine						
(2)	LPG Barges	260 x 42	n/a	n/a	7/92 and 8/92	
(2)	Double Hull Oil Barges	487 x 80	n/a	n/a	1/93 and 7/93	
Yard 88 – Trinity Gulfport						

THE Model 12
(two components)
Designed for vessels
with limited space
Sizes:
F-12 Filter:
12 1/2"lx12 1/2"h
D-12 Digester:
27"lx15"wx12"h
Weight:
40lbs. dry, 115lbs. wet
Power:
low draw
12 volt system
drawing 6 amps
or 110 volt
drawing 10 amps

Sewage flows from the head directly into the Digester(s) which makes its way through a series of baffles and is broken down and dissolved by natural bacterial action during this stage. The resulting liquid (effluent) is then pumped through the Filter and passes through the chlorinator, where the final stage of purification and deodorization takes place. Upkeep simply requires an addition of the Humphrey Activator flushed through the head periodically, a spot check on the chlorine pellets and filter. That's it, No Fuss, No Fuss!

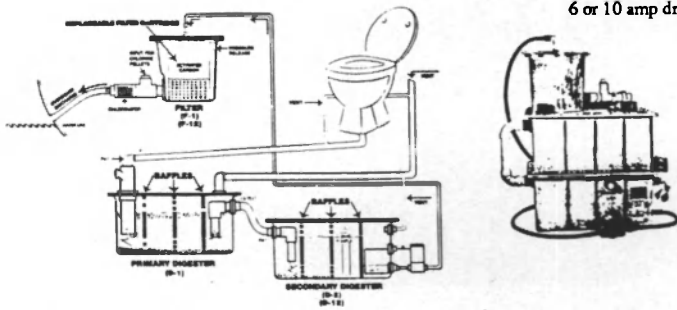
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**SMALL RUGGED
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This compact Sewage Treatment system emits clear and odorless discharge better than the TYPE III, no discharge devices, which requires the use of pump out facilities that are inadequate across the country.

THE Model 10A
(three components)
Sizes:
F-1 Filter:
12 1/2" x 15" x 12" h
D-1 & D-2 Digester:
27" x 15" x 12" h
Weight:
66lbs. dry, 225lbs. wet
Power:
Available in 12V or 110V
6 or 10 amp draw

Models available for any crew size



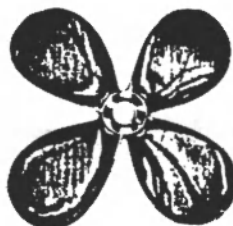
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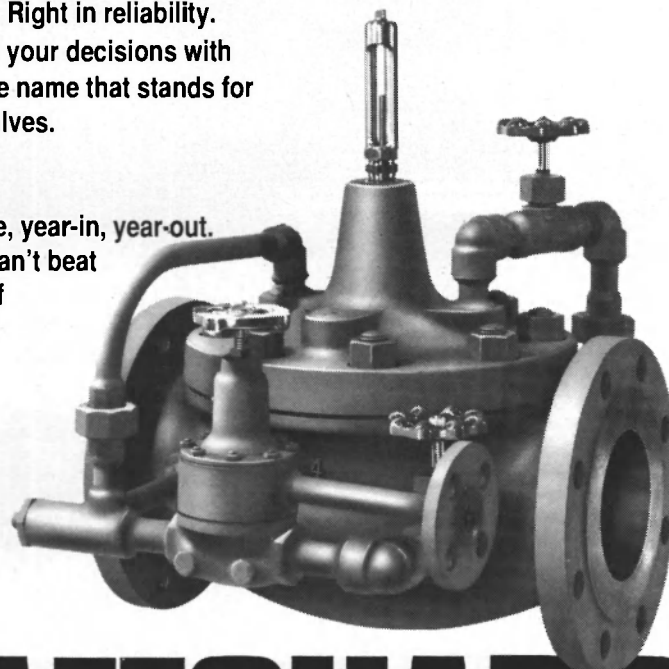
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Maritime Reporter/Engineering News

U.S. Yard Survey (Continued)

SHIPYARD		Dimensions (in feet)		Main Engines	Owner/Operator	Delivery Date
Vessel	Type	L x W x D				
	Drill Barge	200 x 80	n/a	n/a		11/92
(2)	Deck Barges	260 x 72	n/a	n/a		12/92 to 4/93
(2)	Double Hull Tank Barges	332 x 54	n/a	n/a		6/93 and 8/93
	Oil Recovery Barge	274 x 58	n/a	M.S.R.C.		6/93
Yard 83 -- Beaumont, Texas						
	Oil Spill Response Vessel	208 x 44	Caterpillar	M.S.R.C.		4/93
(2)	Double Hull Tank Barges	332 x 74	n/a	n/a		3/93 and 10/93
	Double Hull Tank Barge	325 x 60	n/a	n/a		1/94
Yard 80 -- Brownsville, Trinity Inland Marine Group & Yard 37 -- Madisonville						
	Hopper Barges	196 x 200	n/a	Commercial		1/92 to 4/93
	Tank Barges	196 x 200	n/a	Commercial		1/92 to 4/93
	Deck Barges	196 x 200	n/a	Commercial		1/92 to 4/93

Washburn & Doughty Associates, Inc., P.O. Box 296,
East Boothbay, Maine 04544

SHIPYARD		Dimensions (in feet)		Main Engines	Owner/Operator	Delivery Date
Vessel	Type	L x W x D				
Capt. Charles Philbrook	Ferry	130 x 36 x 12	Caterpillar	State of Maine DOT		4/93
Capt. Neal Burgess	Ferry	130 x 36 x 12	Caterpillar	State of Maine DOT		6/93
Emerald	Dinner Cruise	151 x 33 x 10	Caterpillar	Neuman Boat Line		1994
Princess	Passenger Ferry	85 x 30 x 10	n/a	Casco Bay Transit District		4/94
Westport Shipyard, Inc., P.O. Box 308, Westport, Wash. 98595						
Kenai Explorer	Passenger	90 x 22 x 5	DDA	Kenai Explorer.		Spring 93
Hull 7505	Passenger					
	Vessel	80 x 23 x 3	DDA	Westcoil		Fall 93
Hull 7516	n/a	106 x 23 x 6	DDA	Westship		Fall 93
Hull 7605	n/a	106 x 23 x 6	MTU	Westship		Spring 93
Hull 7606	n/a	112 x 23 x 6	MTU	Westship		Fall 93
Hull 7609	n/a	106 x 23 x 6	MTU	Westship		Spring 94

Zidell Marine Group, 3121 S.W. Moody Ave., Portland, Ore. 97201

Well Barge	270 x 42 x 16.5	n/a	Brix Maritime	10/92
Double Hull Tank Barge	328 x 76	n/a	Brix Maritime	2/93

(Please See page 143 For Late Additions)



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For Over 65 Years

Anchor Windlasses for Chain
1/2" to 4" A.B.S. Certified

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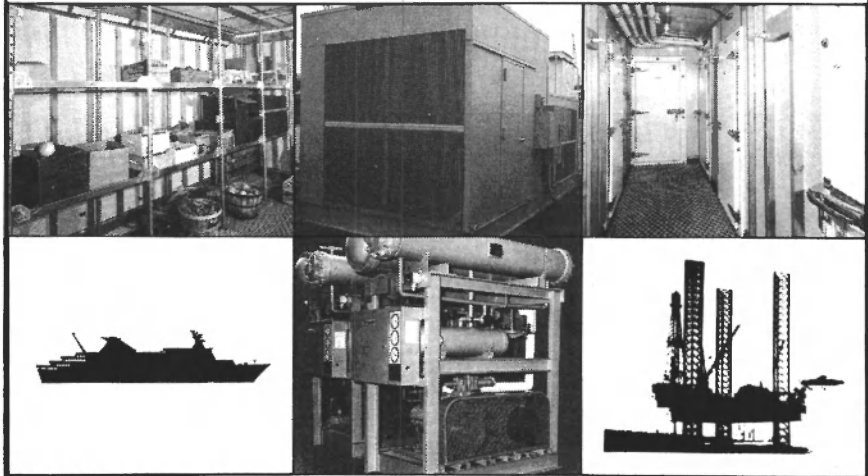
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WITH SYNCROLIFT®
ATLAS

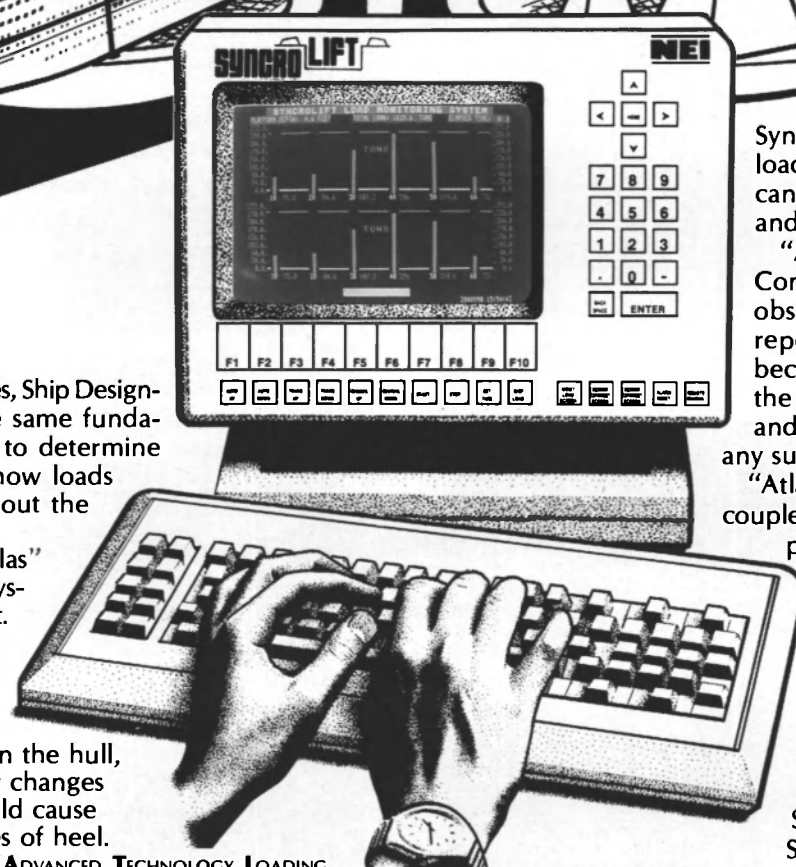


Since Archimedes, Ship Designers have used the same fundamental principles to determine ship weight and how loads are distributed about the vessel.

Syncrolift's "Atlas" Load Monitoring System changes all that. Today you can actually lift a ship; measure her LCG, TPM/TPI; assess torsional stresses in the hull, and check for any changes in load which could cause unnecessary angles of heel.

Using "Atlas" (ADVANCED TECHNOLOGY LOADING ARTICULATED SHIFTS) with a Syncrolift transfer system means that vessel loads can be accurately assessed prior to launch so that trim, heel, and draft can be accurately predicted. No more bitten fingernails at the launching ceremony!

For refits, load distribution can be recorded on docking; recalled, and checked prior to undocking so that differentials can be equalized.



Docking too becomes a much safer procedure with Syncrolift — uneven blocking, or high load concentrations about the blocking can be easily detected by the operator, and corrective action taken.

"Atlas" also includes a comprehensive Condition Monitoring package which observes all parts of the system, and reports potential faults before they become serious. "Atlas" even measures the overall efficiency of the hoist system, and maintains records which indicate any sudden changes.

"Atlas" can do all this because it is coupled to Syncrolift's patented articulated platform structure, which has been proven in over 33 years of shipbuilding experience. Today there are 190 Syncrolift installations in 62 countries worldwide. "Atlas" is the product of the same unique expertise.

Over 1,000,000 shiplifting operations have been performed by Syncrolifts since we started. Today Syncrolift still leads the weigh, putting 190 Shipbuilding and/or Shiprepair yards on a scale above their competitors. It's what you might expect from the only company in the world devoted exclusively to the Design and Manufacture of Shiplift Systems.

For further information on how "Atlas" can help you keep weigh ahead, contact NEI Syncrolift. We look forward to hearing from you.



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ELS Delivers Advanced Jack-Up Rig To A.P. Moller



The Maersk Gallant on its way for delivery to A.P. Moller.

A.P. Moller recently took delivery of one of the most advanced and one of the largest jack-up rigs in the world, newbuilding No. B 223, Maersk Gallant, from Far East Levingston Shipbuilding (FELS) of Singapore.

The rig arrived in the North Sea in mid-May. The Maersk Gallant has been awarded a contract by Amoco Norway Oil Co. for an exploration drilling program commencing in early August 1993. After that, the rig will work for Elf Petroleum Norge A/S for a longer period, starting in the summer of 1994.

Crowley Announces Plans To Purchase Two Tractor Tugs

Crowley Marine Services of Oakland, Calif. announced that it plans to award contracts for two \$12 million tractor tugs. Each tug must be under 140 feet long with a 48-foot beam and a 21-foot draft. The tugs will reportedly be outfitted with twin Caterpillar engines capable of delivering 5,400 hp each, as well as twin Voith-Schneider propellers. The tugs are expected to be able to handle even very large disabled tankers in both harbors and offshore and will have reinforced hulls that will allow them to work in icy waters.

The tugs will probably be used as vessel escorts along the coast of Alaska and the Pacific Northwest, and Crowley plans to order other tugs as the market for tanker escort services develops. If the demand increases as Crowley expects it to, Crowley may eventually acquire a total of eight large tractor tugs.

Sonsub Announces Completion Of Several Jobs

Houston-based Sonsub, a leader in the development and operation of

remotely controlled underwater vehicles and specialized tooling systems, recently announced the successful completion of several contracted jobs.

— The company completed the final phase of its contract supporting the installation of Exxon's Zinc Platform in the Gulf of Mexico. After providing specialized ROV's, winches and hydraulic tools to perform installation and flow line tie-in

tasks, Sonsub mobilized a Triton Advanced Remotely Operated Work Systems (AROWS) to assist with hydrotesting, the operation of pig and valve assemblies and valve actuation on the template in preparation for production to begin.

— Sonsub completed a quick call out project, as a subcontractor to Global Divers and Contractors, to investigate a natural gas blow-out with no pollution on a jack-up rig in

the Gulf of Mexico.

— Finally, the company leased a Viper Remotely Operated Vehicle (ROV) to Martech USA, Inc. of California, to support the installation of a sewer outfall pipeline off the coast of San Diego.

For more information on the products and services of Sonsub,

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- LCD digital display
- Choose gyro, magnetic or TMC input (Transmitting Magnetic Compass)
- Easily installed on any sized vessel
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- Compact

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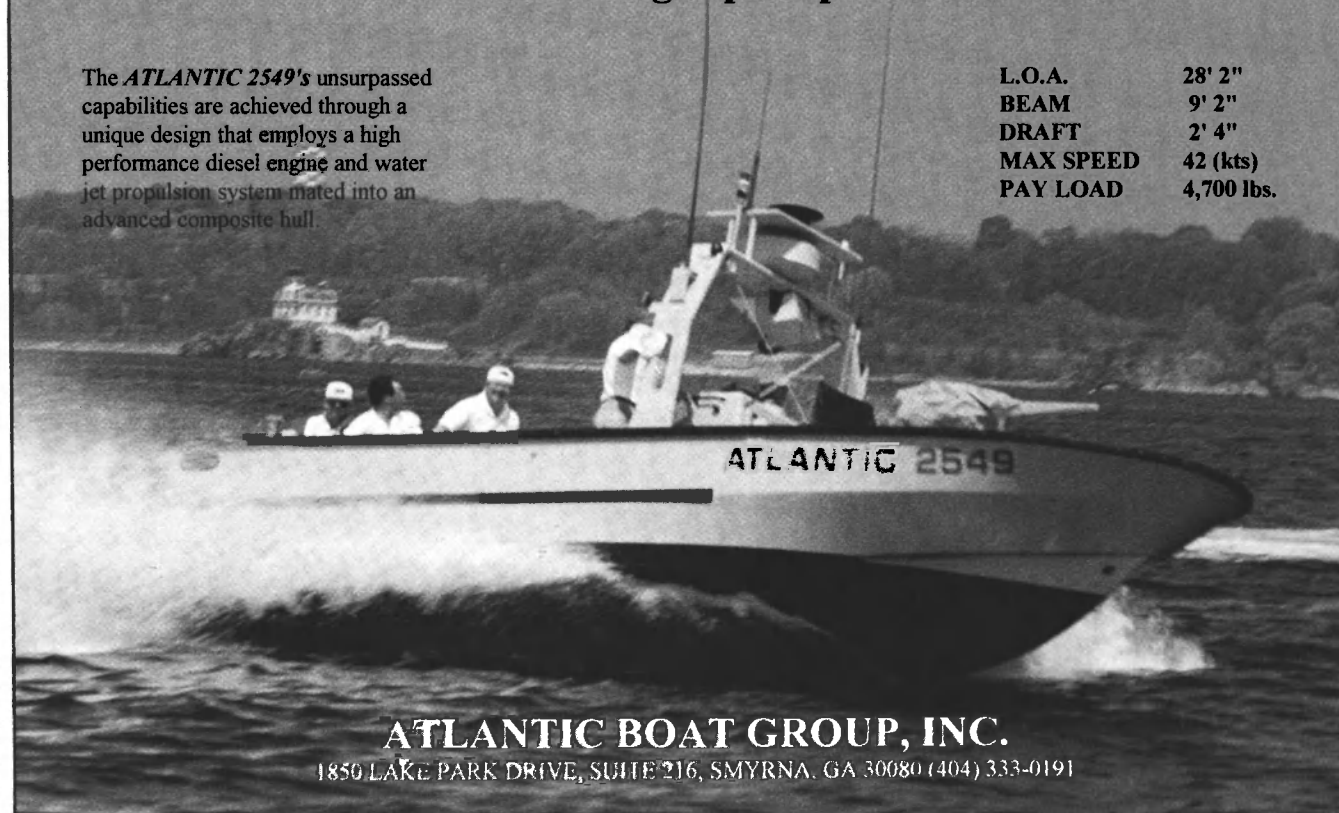
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ATLANTIC 2549

A new class of high speed patrol boats

The ATLANTIC 2549's unsurpassed capabilities are achieved through a unique design that employs a high performance diesel engine and water jet propulsion system mated into an advanced composite hull.

L.O.A.	28' 2"
BEAM	9' 2"
DRAFT	2' 4"
MAX SPEED	42 (kts)
PAY LOAD	4,700 lbs.



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We Care

The Seamen's Church Institute is a dedicated advocate for the personal and professional well-being of merchant seafarers the world over. Through its Center for Maritime Education, Center for Seafarers' Services and the Center for Seafarers' Rights, the Institute cares for the safety, dignity and improved working and living conditions for all those who go down to the sea in ships. Founded in 1834, the Institute today is an ecumenical agency serving the needs of seafaring people of all races, creeds and nationalities.

The goals of the Center for Maritime Education are to improve the seafarer's professional capabilities and these goals are accomplished through advisory services and high-quality training courses and programs designed to meet the ever-changing needs of the maritime industry.

Courses vary from a program of guided study to upgrade seafarers to the levels required to sit for the United States Coast Guard license examinations to programs utilizing state-of-the-art simulation equipment consisting of four simulated, interactive ship bridges with extensive navigational areas. Whatever the nature of the

training, whether it is a tutorial on a one-to-one basis or one utilizing sophisticated simulation equipment, the Center for Maritime Education provides quality instruction provided by expert and well-trained instructors who care and whose sole aim is to serve the training needs of the seafarer.

The quality of the course content, flexibility of the training programs, attention to the client needs and the expertise of instruction have already earned us a reputation of setting new standards in maritime training. We care for the training needs of all seafarers from individuals seeking license preparation to companies requiring custom-designed training programs. So give us a call, (212) 233-2242, and we will provide you with details of all our courses. If the type of course you are seeking is not listed then we will design one for you based on your special requirements. We also encourage you to visit our facility at 241 Water Street in Lower Manhattan, see a demonstration at our new training center, and let us discuss with you how we can fulfill your training and research needs.

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S. FLAG OCEANGOING MERCHANT FLEET

OWNER/OPERATOR Name of Ship	Type	GT	DWT	HP T-Turbine D-Diesel	Year Built/ Rebuilt
RICAN AUTOCARRIERS, INC. allenius Lines North America, Inc., P.O. Box 1232, Woodcliff, NJ 07675-1232					
Aust	PCC	51,858	28,070	D-16,980	85
ASAC Ranger	PCTC	16,568	17,631	D-18,600	78
naged by International Marine Carriers, Inc., Mineola, N.Y.					
ERICAN AUTOMAR INC. 5 Thomas Jefferson Street, Suite 308, Washington, D.C. 20007					
American Cormorant	Semisub HvyLft.	10,186	47,230	D-19,700	75/82
American Eagle	Ro-Ro	15,952	20,450	D-21,600	81
American Kestrel	LASH	24,406	39,130	T-35,000	72
ssels managed by Osprey Ship Management, Washington, D.C.					
ERICAN HAWAII CRUISES 0 Kearny Street, San Francisco, CA 94108					
Constitution	Cruise	30,090	7,100	T-55,000	51/88
Independence	Cruise	30,090	7,100	T-55,000	50/88
.ERICAN HEAVY LIFT SHIPPING CO. 20 Post Oak Blvd., Suite 480, Houston, Tx 77027					
King	Tanker	20,138	34,723	T-13,600	57
Knight	Tanker	20,026	34,723	T-13,600	58
Solar	Tanker	18,116	30,806	T-13,600	59
Spray	Tanker	18,150	30,806	T-13,600	60
AMERICAN MARITIME TRANSPORT, INC. 120 White Plains Rd., P.O. Box 2011, Tarrytown, NY 10591-9011					
Golden Endeavor	Tanker	44,870	91,849	T-24,500	74
AMERICAN OVERSEA MARINE CORPORATION 116 East Howard Street, Quincy, MA 02169					
2nd Lt. John P. Bobo	Ro-Ro	32,903	22,700	D-26,400	85
Pfc. Dewayne T. Williams	Ro-Ro	32,903	22,700	D-26,400	85
1st Lt. Baldomero Lopez	Ro-Ro	32,903	22,700	D-26,400	85
1st Lt. Jack Lummus	Ro-Ro	32,903	22,700	D-26,400	86
Sgt. William R. Button	Ro-Ro	32,903	22,700	D-26,400	86
*Lake	Cargo	9,259	12,476	T-12,100	61
*Pride	Cargo	9,252	12,412	T-12,100	60
*Scan	Cargo	9,259	12,483	T-12,100	61
*Southern Cross	Cargo	9,259	12,519	T-12,100	62
*Cape Carthage	Cargo	9,397	12,684	T-11,000	63
*Cape Catoche	Cargo	9,397	12,684	T-11,000	63
*Cape Canaveral	Cargo	9,397	12,684	T-11,000	64
*Aide	Cargo	7,846	10,986	T-13,750	61
*Cape Ann	Cargo	11,309	12,728	T-18,150	62
*Cape Avinof	Cargo	11,309	12,728	T-18,150	63
*Curtiss	T-AVB	23,255	13,651	T-30,000	69
*Wright	T-AVB	23,255	13,651	T-30,000	70
*Under contract from MSC					
AMERICAN PRESIDENT LINES, LTD. 1111 Broadway, Oakland, CA 94607					
President Adams	Conbulk	50,205	53,613	D-57,000	88
President Arthur	Container	36,800	44,966	D-28,800	87
President Buchanan	Container	36,800	44,966	D-28,800	87
President Eisenhower	Container	36,860	46,600	D-43,200	80/84
President F.D. Roosevelt	Container	36,195	46,600	D-43,200	80/84
President Garfield	Container	36,800	44,966	D-28,800	87
President Grant	Container	26,746	37,942	D-32,000	71/78/83
President Harding	Container	36,800	44,966	D-28,800	87
President Harrison	Container	28,163	34,515	T-32,000	71/78
President Hoover	Container	26,746	39,419	T-32,000	71/78/83
President Jackson	Conbulk	50,205	53,613	D-57,000	88
President Jefferson	Container	21,467	23,170	T-28,500	73
President Kennedy	Conbulk	50,205	53,613	D-57,000	88
President Lincoln	Container	40,627	35,765	D-43,200	82
President Monroe	Container	40,627	35,765	D-43,200	83
President Polk	Conbulk	50,205	53,613	D-57,000	88
President Truman	Conbulk	50,205	53,613	D-57,000	88
President Tyler	Container	26,746	39,419	T-32,000	72/78/83
President Washington	Container	40,627	35,765	T-43,200	82
APEX MARINE CORPORATION 2001 Marcus Avenue, Lake Success, NY 11042					
American Heritage	Tanker	44,000	91,849	T-24,500	78
Charleston	Tanker	21,649	39,366	T-12,000	56/80
Golden Monarch	Tanker	44,900	91,388	T-24,500	75
Gulf Farmer	Breakbulk	8,988	11,368	T-11,000	65
Gulf Merchant	Breakbulk	8,988	11,368	T-11,000	65
Gulf Shipper	Breakbulk	8,988	11,368	T-11,000	65
Del Viento	Breakbulk	10,396	19,285	T-11,660	68
ARCO MARINE, INC. (ATLANTIC RICHFIELD COMPANY) 300 Ocean Gate, Long Beach, CA 90802-4341					
Arco Alaska	Crude Tanker	83,675	188,436	T-28,000	79
Arco Anchorage	Crude Tanker	57,691	120,266	T-26,000	73
Arco California	Crude Tanker	83,675	124,999	T-28,000	80
Arco Fairbanks	Crude Tanker	57,691	120,319	T-26,000	74
Arco Independence	Crude Tanker	117,515	262,376	T-35,000	77
Arco Juneau	Crude Tanker	57,691	120,266	T-28,000	74
Arco Prudhoe Bay	Product Tanker	35,646	70,278	T-20,000	71
*Arco Sag River	Product Tanker	35,646	70,215	T-20,000	72
Arco Spirit	Crude Tanker	117,515	262,376	T-35,000	77
Arco Texas	Crude Tanker	39,664	89,950	T-20,000	73/81
*The Arco Sag River is scheduled to be converted to a product tanker in early June 1992.					
ATLANTIC TANKSHIPS, INC. 5 Koger Executive Center, P.O. Box 13348, Norfolk, VA 23506					
Sea Venture	Chemical Tanker	9,993	18,924	D-8,680	72/73
BAY SHIP MANAGEMENT INC., AFFILIATE OF BAY TANKERS INC. 5 Koger Executive Center, P.O. Box 13348, Norfolk, VA 23506					
USNS Algal	SL-7	48,142	25,595	T-120,000	—
*USNS Altair	SL-7	48,142	25,595	T-120,000	73
USNS Antares	SL-7	48,142	25,595	T-120,000	—
USNS Bartlett	Oceanographic	1,143	—	D-1,000	69
USNS Bellatrix	SL-7	48,142	25,595	T-120,000	—
USNS Capella	SL-7	48,142	25,595	T-120,000	—
*USNS Denabola	SL-7	48,142	25,595	T-120,000	73
USNS Kane	Oceanographic	2,616	—	D-3,000	67
*USNS Pollux	SL-7	48,142	25,595	T-120,000	73
*USNS Regulus	SL-7	48,142	25,595	T-120,000	73
USNS Silas Bent	Oceanographic	2,456	—	D-3,000	65
USNS Wilkes	Oceanographic	2,616	—	D-3,000	71
USNS Wyman	Oceanographic	2,617	—	D-3,000	71
*Under contract from MSC.					
CENTRAL GULF LINES, INC. 650 Poydras Street, Suite 1700, Poydras Center, New Orleans, LA 70130					
Austral Rainbow	LASH	26,456	29,749	T-32,000	72
Caps Express	SSB	—	14,894	—	76
Green Valley	LASH	28,487	46,908	T-32,000	74
Green Island	LASH	28,487	46,908	T-32,000	75
Green Harbour	LASH	28,487	46,908	T-32,000	74
Green Wave	Cargo	9,521	12,487	D-10,000	81
Green Ridge	Cargo	9,521	12,487	D-10,000	81
Green Bay	PCC	38,659	13,491	D-11,600	87
Green Lake	PCC	46,950	14,104	D-13,120	87
Rover	Ro-Ro	11,757	15,946	T-30,000	69
CHESAPEAKE SHIPPING CO. c/o Prentice-Hall Corp., 229 S. State Street, Dover, DE 19901					
Bridgeton	Tanker	210,065	407,823	T-45,000	77
Chesapeake City	Tanker	44,313	82,572	D-17,000	81
Ocean City	Tanker	55,620	82,572	D-17,000	81
Sea Isle City	Tanker	55,454	81,283	D-12,720	81
Surf City	Tanker	44,542	81,283	D-12,720	81
CHEVRON SHIPPING COMPANY 555 Market Street, San Francisco, CA 94105					
Chevron Arizona	Product Carrier	16,941	39,207	GT/E-12,500	77
Chevron California	Tanker	35,588	70,213	T-20,000	72
Chevron Colorado	Product Carrier	16,941	39,213	GT/E-12,500	76

U.S. Flag Oceangoing Merchant Fleet (continued)

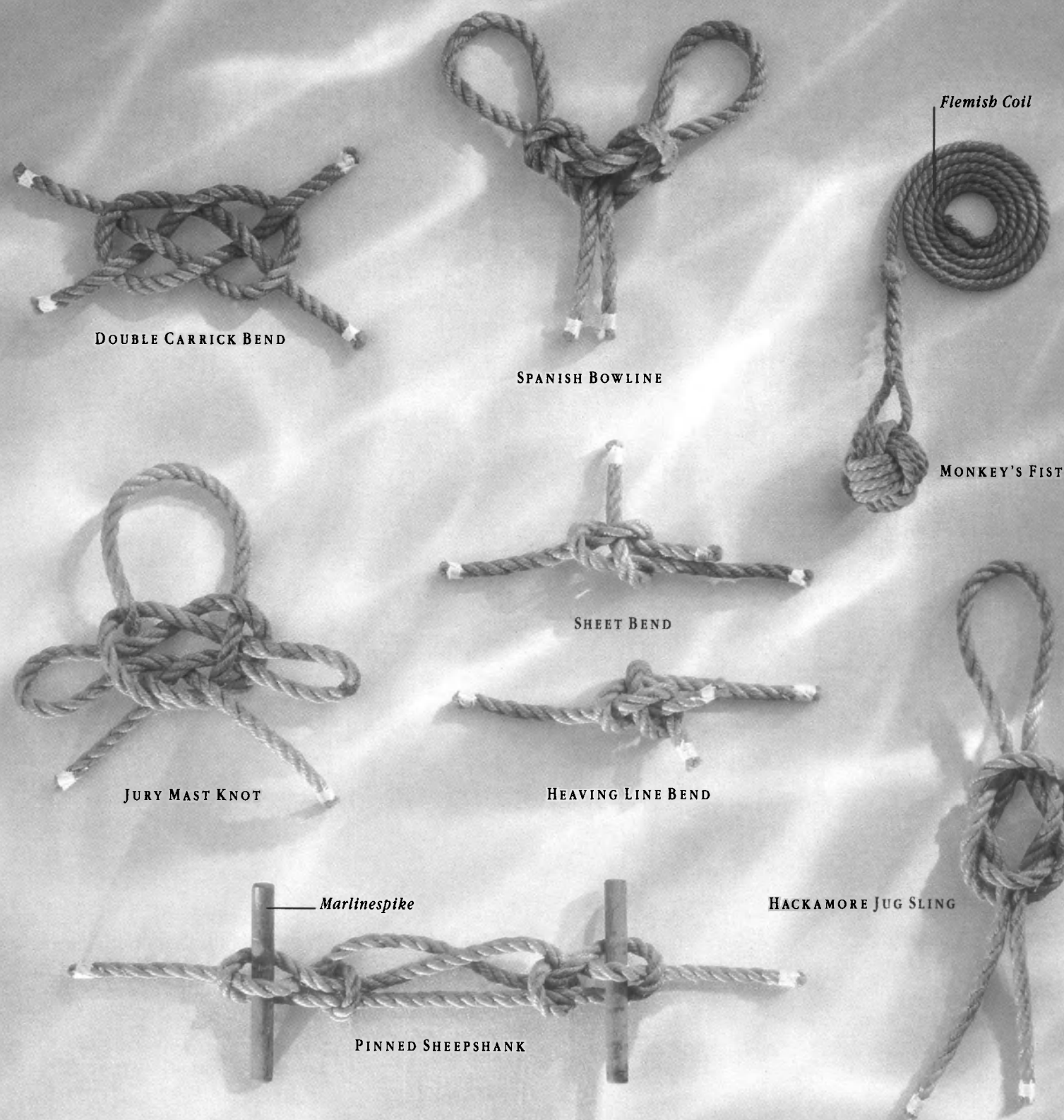
OWNER/OPERATOR Name of Ship	Type	GT	DWT	HP T-Turbine D-Diesel	Year Built/ Rebuilt	OWNER/OPERATOR Name of Ship	Type	GT	DWT	HP T-Turbine D-Diesel	F
CHEVRON SHIPPING COMPANY (cont.)						Export Patriot	Container	17,904	16,345	T-17,500	
Chevron Louisiana	Product Carrier	16,941	39,167	GT/E-12,500	77	Resolute	Container	17,904	16,205	T-17,500	
Chevron Mississippi	Tanker	35,589	70,213	T-20,000	72	HVIDE SHIPPING INCORPORATED					
Chevron Oregon	Product Carrier	16,941	39,218	GT/E-12,500	75	2200 Eller Drive, Bldg. 27, Fort Lauderdale, FL 33316					
Chevron Washington	Product Carrier	16,941	39,167	GT/E-12,500	76	Seabulk America	Chemical Tanker	—	47,000	D-11,550	
COASTAL TANKSHIPS USA, INC.						Seabulk Challenger/ STL 3901	ITB	20,982	39,345	D-14,000	
9 Greenway Plaza, Houston, TX 77046						Seabulk Magnachem/ SCC3902	ITB	18,671	39,344	D-14,000	
Coastal Corpus Christi	Tanker	23,299	51,196	T-19,000	60	INTERNATIONAL MARINE CARRIERS, INC.					
Coastal Eagle Point	Tanker	26,198	51,051	T-19,000	60	22 Jericho Turnpike, Mineola, NY 11501					
Coastal Manatee	Tanker	19,030	30,806	T-13,600	61	Green State	Container	16,956	17,449	T-19,250	6
Coastal New York	Tanker	23,459	39,400	T-13,650	56/72	Grand Canyon	Container	17,137	17,448	T-19,250	6
COASTAL TUG & BARGE, INC.						Keystone State	Container	17,128	26,330	T-19,250	6
8700 West Flagler Street, Miami, FL 33174						Cape Farewell	LASH	29,508	41,363	T-32,000	7
Coastal Port Everglades/ Coastal 101	ITB	17,634	36,846	D-15,200	81/79	Cape Flattery	LASH	29,508	41,363	T-32,000	7
Coastal Jacksonville/ Coastal 23	ITB	6,231	12,200	D-3,700	71/77	Cape Florida	LASH	26,406	30,298	T-32,000	7
COVE SHIPPING INC.						Cape Race	Ro-Ro	13,379	22,858	D-28,000	7
200 Virginia Street, Mobile, AL 36603						Cape Ray	Ro-Ro	14,825	22,735	D-28,000	7
Cove Liberty	Tanker	33,596	69,306	T-22,000	54/74/81	Cape Rise	Ro-Ro	14,835	22,853	D-28,000	77
Cove Trader	Tanker	28,310	49,339	T-15,000	59/79/82	M/S Faust	PCTC	17,951	28,050	T-16,980	85
CREST TANKERS, AFFILIATED WITH TRINIDAD CORPORATION						S/L Antarctic	Tanker	17,157	27,221	T-14,000	75
8182 Maryland Ave., St. Louis, MO 63117						S/L Arabian Sea	Tanker	17,134	27,202	T-14,000	75
Chablis	Tanker	19,030	30,806	T-15,000	60	S/L Arctic	Tanker	17,158	27,221	T-14,000	75
Montrachet	Tanker	18,407	30,806	T-15,000	59	S/L Atlantic	Tanker	17,158	27,214	T-14,000	75
CROWLEY MARITIME CORPORATION						S/L Caribbean	Tanker	17,158	27,223	T-14,000	75
155 Grand Avenue, Oakland, CA 94612						S/L China Sea	Tanker	17,134	27,400	T-14,000	75
Ambassador	Ro-Ro	13,412	9,900	D-10,000	80	S/L Indian Ocean	Tanker	17,134	27,400	T-14,000	75
Senator	Ro-Ro	13,498	9,900	D-10,000	81	S/L Mediterranean	Tanker	17,158	27,717	T-14,000	74
American Condor	Ro-Ro/Lo-Lo	15,636	20,730	D-21,600	81	S/L Pacific	Tanker	17,134	27,400	T-14,000	74
American Falcon	Ro-Ro/Lo-Lo	15,636	20,730	D-21,600	81	INTEROCEAN MANAGEMENT CORPORATION					
Sea Fox	Con/Ro-Ro	32,781	33,625	D-23,030	84	Three Parkway, Suite 1300, Philadelphia, PA 19102					
Sea Lion	Con/Ro-Ro	32,781	33,625	D-23,030	85	Brooks Range	Tanker	74,250	165,037	T-26,700	78
Sea Wolf	Con/Ro-Ro	32,781	33,625	D-23,030	84	Thompson Pass	Tanker	74,250	165,037	T-26,700	78
ENERGY TRANSPORTATION CORPORATION						U.S.T. Atlantic	Tanker	189,416	398,143	T-45,000	79
1185 Avenue of the Americas, New York, NY 10036						U.S.T. Pacific	Tanker	189,416	398,143	T-45,000	79
Energy Altair	Tug	262.6	—	D-4,800	82	*Cape Bon	Breakbulk	N/A	14,700	N/A	67
Energy Ammonia	LPG Barge	11,438	12,110	—	82	*Cape Ducato	Ro-Ro	N/A	13,800	N/A	72
LNG Aquarius	LNG	95,084	71,475	T-43,000	77	*Cape Edmont	Ro-Ro	N/A	20,000	N/A	71
LNG Aries	LNG	95,084	71,466	T-43,000	77	*Cape Fear	LASH	26,406	29,800	T-28,000	71
LNG Capricorn	LNG	95,084	71,409	T-43,000	78	*Cape Nome	Ro-Ro	N/A	15,700	N/A	69
LNG Gemini	LNG	95,084	71,327	T-43,000	78	*Cape Henry	Ro-Ro	N/A	32,000	N/A	79
LNG Leo	LNG	95,084	71,409	T-43,000	78	*Cape Horn	Ro-Ro	N/A	31,800	N/A	79
LNG Libra	LNG	95,084	71,503	T-43,000	79	*Cape Hudson	Ro-Ro	N/A	31,900	N/A	79
LNG Tarus	LNG	95,084	71,495	T-43,000	79	*Cornhusker State	T-ACS	16,189	17,500	T-19,250	69/88
LNG Virgo	LNG	95,084	71,482	T-43,000	79	*Diamond State	T-ACS	16,189	17,500	T-19,250	89
EXXON SHIPPING COMPANY						*Equality State	T-ACS	16,189	17,500	T-19,250	89
P.O. Box 1512, Houston, TX 77001						*Flickertail State	T-ACS	16,189	17,500	T-19,250	88
Exxon Baton Rouge	Tanker	34,266	75,783	T-19,000	69	*Gopher State	T-ACS	16,189	17,500	T-19,250	87
Exxon Baytown	Tanker	32,136	57,720	D-17,000	84	Green Mountain State	T-ACS	16,189	17,500	T-19,250	69/90
Exxon Benicia	Tanker	75,272	149,900	T-26,700	79	*Meteor	Ro-Ro	N/A	12,300	N/A	67
Exxon Charleston	Products Tanker	27,798	48,075	D-17,000	84	*Under contract from MarAd.	Ro-Ro	N/A	12,300	N/A	67
Exxon Galveston	Tanker	12,769	26,923	D-7,000	70/78	KEYSTONE SHIPPING CO.					
Exxon Jamestown	Tanker	19,734	40,631	T-26,500	57	313 Chestnut Street, Philadelphia, PA 19106					
Exxon Long Beach	Tanker	95,000	211,469	D-31,650	87	Aitgun Pass	Crude/Products	74,251	173,380	T-26,700	77
Exxon New Orleans	Tanker	32,035	72,056	T-19,000	65	*Cape Victory	Ro-Ro	—	22,215	—	—
Exxon North Slope	Tanker	75,272	149,900	T-26,700	79	*Cape Vincent	Ro-Ro	—	22,215	—	—
Exxon Philadelphia	Tanker	34,266	76,192	T-19,000	70	Chelsea	Crude/Products	22,358	39,235	T-15,000	75
Exxon San Francisco	Tanker	34,266	75,649	T-19,000	69	Cherry Valley	Crude/Products	22,385	39,230	T-15,000	74
Exxon Mediterranean	Tanker	95,000	211,469	D-31,650	86	*Chesapeake	Tanker	—	49,229	T-15,000	64
Exxon Wilmington	Products Tanker	27,508	48,011	D-17,000	84	Chestnut Hill	Crude/Products	44,875	91,295	T-24,500	76
FARRELL LINES, INC.						Chilbar	Chemical Tanker	21,937	39,363	T-10,460	59/81
One Whitehall Street, New York, NY 10004						Coronado	Crude/Products	22,358	39,237	T-15,000	73
Argonaut	Container	17,904	16,205	T-17,500	79	Energy Independence	Collier	24,901	38,234	T-12,000	83
Export Freedom	Container	17,904	16,230	T-17,500	72	Fredricksburg	Crude/Products	21,557	39,374	T-20,460	58/80
						Golden Gate	Crude/Products	27,899	61,952	T-20,000	70
						Kenal	Crude/Products	60,385	123,113	T-30,000	79
						Keystone Canyon	Crude/Products	74,251	173,380	T-26,700	78
						Keystoner	Chemical Tanker	11,369	18,384	T-7,700	53
						Kittanning	Crude/Products	44,875	91,344	T-24,500	77
						Prince William Sound	Crude/Products	60,084	121,000	T-30,000	75
						Tonsina	Crude/Products	60,385	122,781	T-30,000	78
						*Shoshone	Tanker	—	26,943	T-16,700	57
						*Vessels operated for MarAd.					

U.S. Flag Oceangoing Merchant Fleet (continued)

OWNER/OPERATOR Name of Ship	Type	GT	DWT	HP T-Turbine D-Diesel	Year Built/ Rebuilt
LIBERTY MARITIME CORPORATION 1979 Marcus Avenue, Suite 200, Lake Success, NY 11042					
Liberty Belle	Tanker	44,900	91,630	T-24,500	76
Liberty Sea	Bulk	33,784	63,739	D-12,300	84
Liberty Spirit	Bulk/Container	33,337	64,152	D-15,800	86
Liberty Star	Bulk/Container	33,337	64,152	D-15,800	86
Liberty Sun	Bulk/Container	33,337	64,059	D-15,800	86
Liberty Wave	Bulk	33,784	64,463	D-12,300	84
LYKES BROS. STEAMSHIP COMPANY 300 Poydras Street, New Orleans, LA 70130					
Adabelle Lykes	Container	16,891	15,378	D-15,750	68/73
Ashley Lykes	Cargo Cont.	11,892	14,524	T-11,000	63/73
Charlotte Lykes	Container	16,891	15,443	D-15,750	68/73
Elizabeth Lykes	General Cargo	10,955	15,538	T-15,500	66
Genevieve Lykes	General Cargo	10,724	15,538	T-15,500	68
Howell Lykes	Container	17,802	22,661	T-24,000	67/72
James Lykes	Cargo Cont.	11,892	14,524	T-9,900	60/72
Jean Lykes	Container	21,467	23,147	T-28,500	73
John Lykes	Cargo Cont.	11,892	14,524	T-9,900	60/72
Leslie Lykes	Cargo Cont.	11,892	14,524	T-9,900	62/72
Letitia Lykes	General Cargo	10,724	15,538	T-15,500	68
Louise Lykes	General Cargo	10,955	15,538	T-15,500	65
Margaret Lykes	Container	16,375	15,450	D-15,750	68/73
Marjorie Lykes	Cargo Cont.	11,892	14,524	T-11,000	62/73
Mason Lykes	Container	17,802	22,661	T-24,000	68/72
Ruth Lykes	General Cargo	10,955	15,538	T-15,500	66
Sheldon Lykes	Container	16,375	15,284	D-15,750	69/73
Stella Lykes	Cargo Cont.	15,949	22,564	T-24,000	69
Sue Lykes	Cargo Cont.	15,949	22,564	T-24,000	69
Thompson Lykes	Container	21,475	23,212	T-28,500	74
Tillie Lykes	Containership	31,920	36,004	D-19,740	85
Tyson Lykes	Containership	31,920	36,004	D-19,740	85
Velma Lykes	Cargo/Cont.	11,892	14,524	T-9,900	72
MAERSK LINE, LTD. Giralda Farms, Madison Avenue, P.O. Box 884, Madison, NJ 07940-0884					
*Cpl. Louis J. Hauge Jr.	Ro-Ro	38,412	23,068	D-16,800	84
*1st Lt. Alexander Bonnyman Jr.	Ro-Ro	38,412	23,068	D-16,800	85
Maersk Constellation	Ro-Ro	21,799	29,750	D-16,500	80
*Plc. William B. Baugh	Ro-Ro	38,412	23,068	D-16,800	84
*Plc. James Anderson Jr.	Ro-Ro	38,412	23,068	D-16,800	85
*Pvt. Harry Fisher	Ro-Ro	38,412	23,068	D-16,800	85
*Under contract to MSC.					
MARINE TRANSPORT LINES, INC. 150 Meadowland Parkway, Secaucus, NJ 07094-1550					
B.T. Alaska	Tanker	83,650	188,099	T-28,000	78
B.T. San Diego	Tanker	83,650	188,099	T-28,000	78
Chemical Pioneer	Chemical Tanker	18,500	35,00	T-15,000	83
Marine Chemist	Chemical Tanker	20,237	35,949	T-15,000	70
Marine Duval	Sulfur Tanker	11,080	24,693	TE-7,000	44/70
Marine Floridian	Sulfur Tanker	11,150	24,838	TE-7,000	44/67
Marine Princess	Bulk Carrier	26,060	51,355	D-13,800	79
Marine Reliance	Pure Car Carrier	35,700	11,400	D-11,700	87
Cape Lambert	Ro-Ro	34,382	20,544	D-18,000	73
Cape Lobos	Ro-Ro	34,380	20,220	D-18,000	72/86
Cape Decision	Ro-Ro	23,913	23,865	D-27,000	73
Cape Diamond	Ro-Ro	23,911	23,725	D-28,890	72
Cape Domingo	Ro-Ro	23,911	23,725	D-28,890	73
Cape Douglas	Ro-Ro	23,972	22,880	D-27,000	73
Marine Glory/MBC#1	Chemical Tug/Barge	N/A	3,700	D-1,900	73
Marine Guardian/MBC#2	Chemical Tug/Barge	N/A	3,700	D-2,600	73
Williamsburgh	Crude Tanker	103,800	225,281	T-50,000	74
Mission Buenaventura	Product Tanker	20,900	38,238	D-15,000	68
Mission Capistrano	Product Tanker	20,800	37,276	D-15,000	71
MATSON NAVIGATION COMPANY 333 Market Street, San Francisco, CA 94105					
Haleakala	Container Barge	3,562	4,658	—	84
Islander	Container Barge	2,474	6,671	—	88
Kaimoku	Container/Ro-Ro	17,525	14,551	T-30,000	76/90
Kaimalu	Container/Ro-Ro	17,513	14,976	T-30,000	74/89
Kauai	Container	24,550	26,308	T-32,000	80
Lurline	Container/Ro-Ro	24,901	22,220	T-30,000	73/82
Manukai	Container	23,786	26,616	T-32,000	70
OWNER/OPERATOR Name of Ship					
Manulani					
Matsonia	Container/Ro-Ro	23,786	26,674	T-32,000	70
Maui	Container	19,301	22,550	T-30,000	73/87
Mauna Loa	Container Barge	24,545	26,623	T-32,000	78
R.J. Pfeiffer	Container	3,562	4,658	—	84
Waialeale	Ro-Ro Barge	31,573	28,555	D-30,000	92
		5,621	7,735	—	91
MOBIL OIL CORPORATION 3225 Gallows Road, Fairfax, VA 22037-0001					
Seminok	Tanker	28,218	49,298	T-15,000	61
Syosset	Tanker	18,348	30,293	T-14,850	58
MORMAC MARINE TRANSPORT INC. Three Landmark Square, Stamford, CT 06901					
Mormacsky	Tanker	22,354	39,232	T-15,000	77
Mormacstar	Tanker	22,354	39,232	T-15,000	75
Mormacsun	Tanker	22,354	39,232	T-15,000	76
OCEAN SHIPHOLDINGS, INC. 16211 Park Ten Place, Houston, TX 77084					
Paul Buck	Tanker	19,037	30,127	D-15,300	85
Samuel L. Cobb	Tanker	19,037	30,127	D-15,300	85
Gus W. Darnell	Tanker	19,037	30,127	D-15,300	85
Lawrence H. Gianella	Tanker	19,037	30,127	D-15,300	86
Richard G. Matthiesen	Tanker	19,037	30,127	D-15,300	86
Julius Hammer/ Oxy 4101	ITB	1,594	45,313*	D-9,100**	81
Frances Hammer/ Oxy 4103	ITB	17,126	45,313*	D-9,100**	81
*Long tons, **Metric.					
OMI CORPORATION 90 Park Avenue, New York, NY 10016					
Courier	Product Tanker	21,572	35,100	D-14,000	77
OMI Champion	Product Tanker	20,858	37,874	T-15,000	69
OMI Charger	Product Tanker	20,877	37,807	T-15,000	69
OMI Columbia	Crude Tanker	67,856	136,507	D-27,300	74/83
OMI Dynachem	Chemical Tanker	32,328	50,852	D-14,100	81
OMI Hudson	Chemical Tanker	32,328	50,852	D-14,100	81
OMI Leader	Product Tanker	20,877	37,807	T-15,000	69
OMI Missouri	Bulk Carrier	26,800	48,890	D-11,100	83
OMI Sacramento	Bulk Carrier	26,800	48,890	D-11,100	83
OMI Star	Chemical Tanker	19,047	37,106	T-15,000	70
OMI Wabash	Product Tanker	20,884	37,853	T-15,000	69
OMI Willamette	Product Tanker	20,884	37,853	T-15,000	69
Patriot	Product Tanker	21,572	35,100	D-14,000	76
Ranger	Product Tanker	21,572	35,100	D-14,000	76
Rover	Product Tanker	21,572	35,100	D-14,000	77
Star of Texas	Bulk Carrier	24,384	36,500	D-15,600	82
OSG BULK SHIPS 1114 Avenue of the Americas, New York, NY 10036					
Overseas Alaska	Tanker	28,250	62,000	T-20,000	70
Overseas Alice	Tanker	20,900	37,800	T-15,000	68
Overseas Arctic	Tanker	28,250	62,000	T-20,000	71
Overseas Boston	Tanker	61,200	120,820	D-26,000	74
Overseas Chicago	Tanker	44,850	90,600	T-24,500	77
Overseas Harriette	Bulk	14,300	25,550	D-11,200	78
Overseas Joyce	PCC	48,017	16,141	D-13,150	87
Overseas Juneau	Tanker	57,700	120,500	T-25,000	73
Overseas Marilyn	Bulk	14,300	25,500	D-11,200	78
Overseas New Orleans	Tanker	21,447	42,954	D-11,200	83
Overseas New York	Tanker	44,900	90,400	T-24,500	77
Overseas Ohio	Tanker	44,850	90,550	T-24,500	77
Overseas Philadelphia	Tanker	21,447	42,595	D-11,200	82
Overseas Valdez	Tanker	20,900	37,800	T-15,000	68
Overseas Vivian	Tanker	20,900	37,800	T-15,000	69
Overseas Washington	Tanker	44,900	90,500	T-24,500	78
PACIFIC - GULF MARINE, INC. 401 Whitney Ave., Suite 211, Gretna, LA 70053; P.O. Box 6479, New Orleans, LA 70174-6479					
Fred G.	Cargo/Cont.	11,891	14,297	T-9,900	60/71
Moku Pahu/HSTC 1	ITB	17,286	37,107	D-14,000	81
Sugar Islander	Bulk Carrier	155,544	29,984	D-12,000	73

OWNER/OPERATOR				HP	Year	OWNER/OPERATOR				HP	Year
Name of Ship	Type	GT	DWT	T-Turbine D-Diesel	Built/ Rebuilt	Name of Ship	Type	GT	DWT	T-Turbine D-Diesel	Built/ Rebuilt
PENN ATRANS CO. CORP. 1155 Avenue of the Americas, New York, NY 10036						SEALIFT, INC. 68 West Main Street, Oyster Bay, NY 11771					
Baltimore Trader	Tanker	27,269	57,884	T-15,000	55/71	Bravado	Tanker	2,110	4,400	D-2,880	77
Chesapeake Trader	Tanker	24,669	50,116	D-11,400	82	Cleveland	Cargo	16,000	22,200	T-24,000	69
Delaware Trader	Tanker	24,669	50,057	D-11,400	82	Inger	Bulker	14,192	23,977	T-7,240	45/62
Potomac Trader	Tanker	24,669	50,057	D-11,400	83	Noble Star	Multi-Bulk	15,922	18,230	D-13,100	77
Texas Trader	Tanker	19,734	40,631	T-26,500	57/80	M/V Valiant	Tanker	4,415	7,635	D-4,500	73/91
						Ultramax	Bulker	39,827	82,199	T-24,500	73
						Ultrasea	Bulker	39,827	83,438	T-24,500	74
PUERTO RICO MARINE MANAGEMENT, INC. 212 Fernwood Avenue, Edison, NJ 08818						SUN TRANSPORT, INC. (SUN REFINING & MARKETING INC.) 500 W. Duttons Mill Road, Aston, PA 19014-3094					
Carolina	Container	19,127	20,100	T-26,000	71	New York Sun	Tanker	19,500	34,400	D-14,200	80
Guayama	Container	18,877	20,600	T-26,000	69	Philadelphia Sun	Tanker	19,500	34,400	D-14,200	81
Humacao	Container	18,765	22,200	T-26,000	68	Texas Sun	Tanker	26,300	53,453	T-18,500	60
Mayaguez	Container	18,878	20,600	T-26,000	68	Tropic Sun	Tanker	20,177	34,700	T-13,600	57
Ponce San Juan	Container	19,127	20,000	T-26,000	70						
Nuevo Ponce	Ro-Ro	17,513	16,943	T-32,000	68/81						
RED RIVER SHIPPING CORP. 6110 Executive Blvd., Suite 620, Rockville, MD 20852						TEXACO MARINE SERVICES, INC. P.O. Drawer 1028, Port Arthur, TX 77641-1028					
M/V Advantage	Breakbulk	12,755	21,990	D-14,000	77	Star Avjet/Star 80	Tug & Barge	(77,000 BBLs)	—	D-3,000	—
M/V Buffalo Soldier	Ro-Ro/Bulk	26,409	—	D-14,000	78/88	Star Fuel Chief/Star 808	Tug & Barge	(155,000 BBLs)	—	D-4,300	—
						Star Georgia	Tanker	16,514	25,156	T-13,600	64
						Star Marrero/Star 2000	Tug & Barge	(25,000 BBLs)	—	—	—
						Star Massachusetts	Tanker	16,515	19,364	T-13,600	63
						Star Oregon	Tanker	23,461	39,363	T-13,650	53/73
						Star Rhode Island	Tanker	16,584	19,364	T-13,600	64
						Valiant/Pennsylvania	ITB	194/12,591	28,500	D-7,780	81/80
						Victory/Texas	ITB	194/12,591	28,500	D-7,780	81/80
SABINE TRANSPORTATION COMPANY P.O. Box 1528, Groves, TX 77619						TOTEM OCEAN TRAILER EXPRESS, INC. 500 Alexander Avenue, Tacoma, WA 98421					
Colorado	Tanker	16,822	30,590	T-7,240	44/72	Great Land	Ro-Ro	17,527	18,115	T-30,000	75
Concho	Tanker	18,682	32,741	T-7,000	45/71	Northern Lights	Ro-Ro	12,000	16,875	T-30,000	75
Guadalupe	Tanker	17,985	30,369	T-7,240	45/78	Westward Venture	Ro-Ro	17,527	18,411	T-30,000	77
Neches	Tanker	20,066	34,930	T-15,000	58						
Pecos	Tanker	17,291	28,749	T-13,750	50						
Sabine	Tanker	20,020	35,018	T-15,000	57						
SEA - LAND SERVICE, INC. 150 Allen Road, Liberty Corner, NJ 07938						TRINIDAD CORPORATION 8182 Maryland Avenue, St. Louis, MO 63117					
Achiever	Container	57,075	58,892	D-28,000	84	Admiralty Bay	Tanker	37,800	80,773	T-24,000	71
Anchorage	Container	20,965	20,833	D-22,540	87	Aspen	Tanker	37,800	80,569	T-24,000	71
Atlantic	Container	57,075	58,892	D-28,000	85	Glacier Bay	Tanker	38,400	80,968	T-24,000	70
Challenger	Container	19,168	25,508	T-27,300	68						
Consumer	Container	23,764	25,206	32,000	73/74						
Crusader	Container	18,389	24,938	T-27,300	69						
Defender	Container	30,086	29,861	D-30,150	80/85						
Developer	Container	30,086</									

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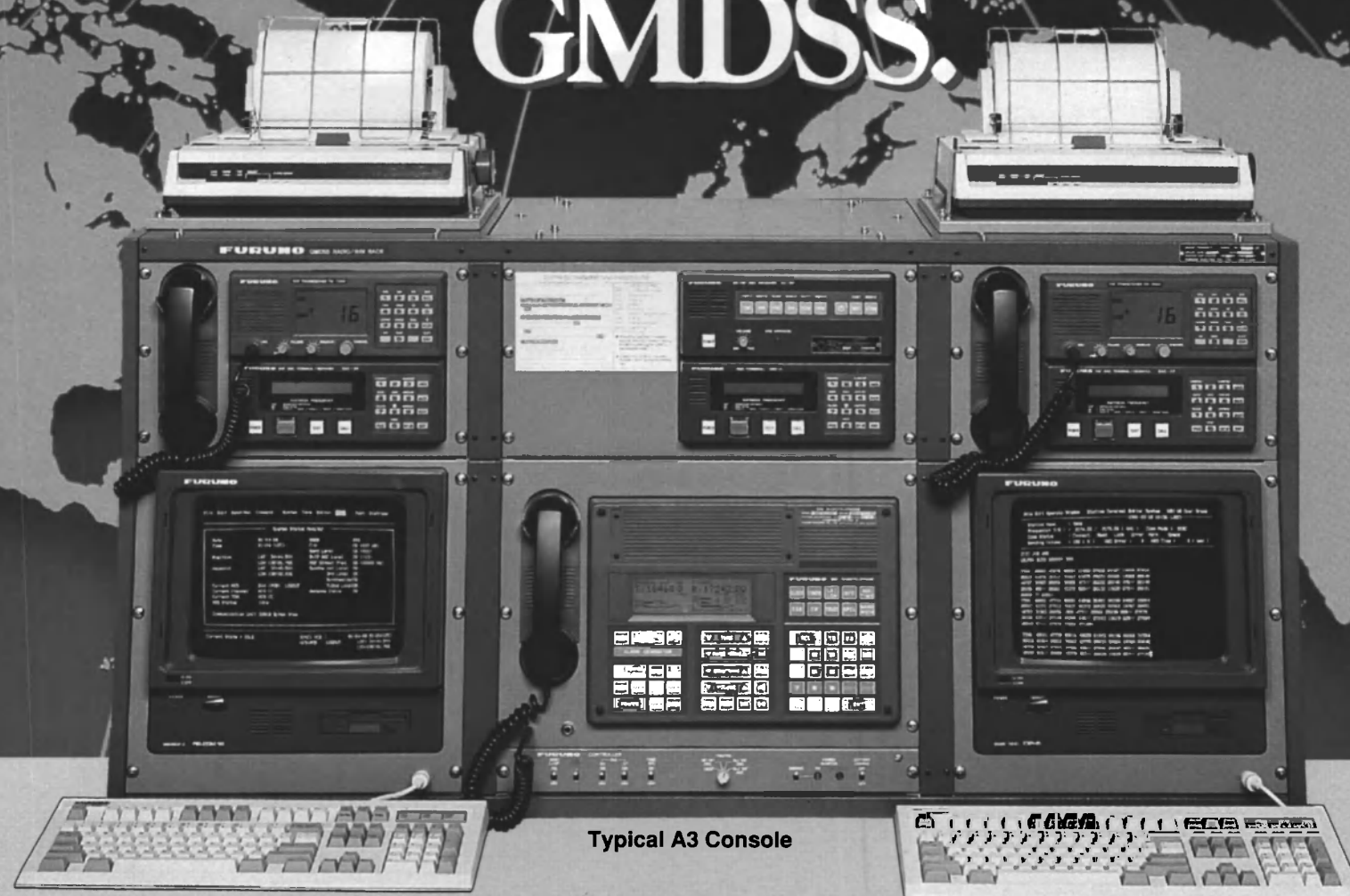
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The Captain Charles Philbrook was recently delivered.

Washburn & Doughty Completes Two Ferries, Starts Work On Two Dinner Boats

Washburn & Doughty Associates of East Boothbay, Maine has launched the third in a series of ferries for the State of Maine Department of Transportation. The aptly named Neal Burgess was launched recently, and is expected to be delivered in July. The Burgess is built for year-round service between Rockland and North Haven, Maine.

The Captain Charles Philbrook was delivered to the State on April 26, and is scheduled to provide year-round service between Rockland and Vinalhaven, Maine.

These two vessels are the sister ship of The Captain Henry Lee, which was delivered last April and provides year-round service between Bass Harbor, Swans Island and Frenchboro Long Island, Maine.

All three ferries are twin screw 130-foot passenger/auto ferries accommodating 250 passengers and 17 vehicles, built to USCG Subchapter H, and designed by Rodney E. Lay & Associates of Jacksonville, Fla. Each vessel is equipped with a pair of Caterpillar 3408 diesel engines generating 402-hp each; three Detroit Diesel generators; and Twin Disc reduction gear. Each vessel has a 12-knot service speed. The design is a double-chined hull with molded form forward and flared keel aft for fuel efficient operation, a rounded stern for efficient displacement speed operation, and flared bow form for smoother rough-water performance. With the launching of the Burgess, Washburn & Doughty has laid the keel for a 150-foot, 600-passenger dinner cruise vessel, The Emerald Empress, which is being built for Neuman Boat Line of Sandusky, Ohio, and scheduled for delivery in April of 1994. Additionally, the yard will start work on a 350-passenger ferry for Casco Bay Island Transit District this month, with delivery scheduled for May 1994.

Navy Says Russian Sub Construction Still Steady

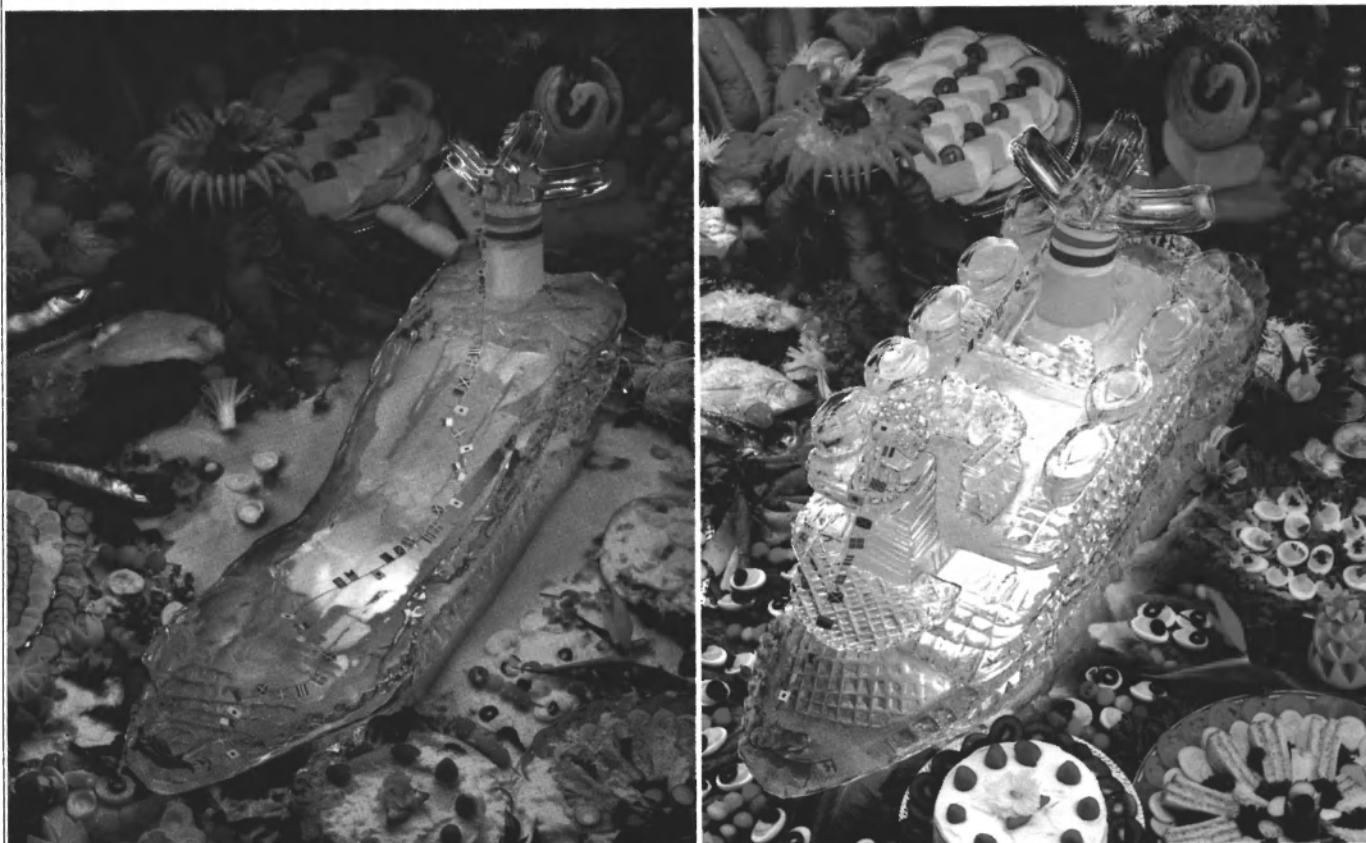
Rear Admiral Ted Sheaffer, director of Navy Intelligence, has reported that the Russian Federation is continuing to support the former Soviet Union's advanced submarine construction program, in spite of its serious economic and political difficulties.

According to the admiral, "the next generation of submarines they

will build is the fourth generation. They have already developed and tested their fourth-generation quieting technologies they intend to deploy in these fourth-generation submarines, to make them quieter than the 688I in many acoustic domains." The 688I is the improved version of the Navy's leading class of nuclear attack submarines, named for its lead ship the U.S.S. Los Angeles (SSN 688).

Admiral Sheaffer expects the

Russians to launch five submarines this year, two diesel-electric Kilo Class, one nuclear cruise-missile submarine and two nuclear attack submarines. Altogether, a total of 27 submarines, 17 nuclear and 10 diesel-electric, have been produced by the Russians since the fall of the Berlin Wall. While the rest of the Russian military is withering, the Russian government would appear to be protecting its advanced submarine research and technology base.



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World-Wide Shipping Build New Carriers Daewoo's Daewoo

World-Wide Shipping of Hong Kong is planning to build up to four size bulk carriers at the Koryu yard of Daewoo in order to modernize its fleet. Daewoo has already built nine VLCCs for World-Wide Shipping in the past years, with the last four of

these to be delivered in the coming months. Two of the four are double-bottom/double-hull vessels. Despite low charter rates, World-Wide is ready to order the four bulkers while scrapping two older VLCCs.

Swath Ocean International Ltd. Changes Name

Swath Ocean International Ltd.,

builder and designer of the SWATH fast ferries Super-Regency, Super-4000, Euro-4000 and the mini-cruise vessel Solas 4000, announced it has changed its company and trading name to Swath International Limited.

The Swath International name change reflects an amicable severance between Swath Ocean Systems, Inc. of Chula Vista, Calif. and the former Swath Ocean International Ltd. Swath International chairman

Timothy D. Kelley said the two companies had "gotten to where we each were pursuing largely different market sectors for SWATH ships and our respective SWATH designs, for that reason, no longer shared common technology. Continuing the common trading name appeared to us to be causing market confusion." For more information on SWATH International Ltd.,

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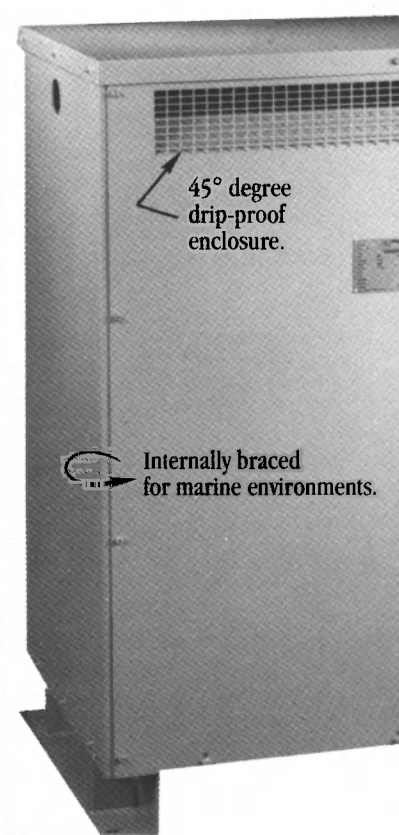
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U.S. PARENT COMPANY FOREIGN FLAG SHIPS

Source: Maritime Administration

PARENT COMPANY Direct Owner	Name of Ship	Class	GT / DWT	Year Flag Built	PARENT COMPANY Direct Owner	Name of Ship	Class	GT / DWT	Year Flag Built
ALCOA STEAMSHIP CO. INC. Lib-Ore SS Co. Inc.	Marlin	Ore/Bulk/Oil	9,792/15,163	Lib. '77	Telegraph Shipping Co. Ltd.	Cariban	Reefer	5,321/6,371	B '8
	Pathfinder II	Bulk Carrier	34,353/47,560	Lib. '81	Chiquita Cincinnati	Reefer		6,117/6,413	B '8
	Prospector II	Bulk Carrier	34,353/47,535	Lib. '82	COASTAL CORPORATION	Coastal Golden	Bulk/Oil	78,164/129,017	Lil '1
	Sentinel II	Bulk Carrier	34,353/47,503	Lib. '82		Coastal Jade	Bulk/Oil	78,164/129,017	Lil '1
	Tarpon	Ore/Bulk/Oil	9,794/15,163	Lib. '77	COMEICA LEASING CORP.	Rio Sulaco	Reefer	6,417/5,656	Bc '8
AMERADA HESS CORP. Seal Island Shipping Corp. Serpentsea Corp. Swansea Corp.	Seal Island	Tanker	123,009/259,042	Lib. '73	CONOCO INC.	Sentinel	Tanker	60,339/106,722	Lib. '1
	Mt. Cabrite	Tanker	122,960/259,447	Lib. '71	Conoco Shipping Co.	Constitution	Tanker	43,850/81,131	Lib. '1
	Saint Lucia	Tanker	122,960/259,447	Lib. '72	EQUILI COMPANY AND EQUITABLE LIFE	Kentucky	Tanker	42,175/79,996	Par '1
AMOCO CORPORATION Amoco Congo Exploration Co. Amoco Ocean Tanker Co.	Conkouati	Tanker	88,439/232,112	Lib. '73		West Virginia	Tanker	42,175/81,279	Par '1
	Ocean Challenger	Tanker	24,584/39,729	Lib. '87	EQUILI COMPANY II U.S. Trust Co. of N.Y. (Trustee)				
	Ocean Conqueror	Tanker	24,584/39,729	Lib. '87					
	Ocean Explorer	Tanker	49,279/81,274	Lib. '88	EXXON CORPORATION				
	Ocean Leader	Tanker	49,279/81,274	Lib. '89	Esso Finland	Esso Finlandia	Chem. Tanker	4,468/6,954	Fin. '1
Amoco Transport Co.	Ocean Navigator	Tanker	49,279/81,274	Lib. '88	Esso Africa	Esso Africa	Tanker	133,969/274,467	Bah. '1
	Ocean Victor	Tanker	35,169/81,283	Lib. '81	Esso Albany	Esso Albany	Tanker	12,806/22,678	Lib. '1
	Ocean Voyager	Tanker	35,315/71,204	Lib. '73	Esso Bahamas	Esso Bahamas	Tanker	123,126/256,715	Bah. '1
	Whiting Sea	Tanker	76,472/132,500	Lib. '75	Esso Bangkok	Esso Bangkok	Tanker	12,994/21,414	Lib. '1
					Esso Bayway	Esso Bayway	Tanker	31,677/50,915	Bah. '1
BANKERS TRUST OF CALIFORNIA N.A.	C.W. Kitto	Tanker	118,218/268,348	Lib. '74	Esso Bermuda	Esso Bermuda	Tanker	123,126/256,715	Bah. '1
	Charles Pigott	Tanker	118,221/268,375	Lib. '73	Esso Demetia	Esso Demetia	Tanker	123,379/258,979	Bn. '1
	Chevron Copenhagen	Tanker	118,179/268,240	Lib. '74	Esso Freeport	Esso Freeport	Tanker	122,967/256,712	Bah. '1
	Chevron Felix	Tanker	118,197/268,432	Lib. '73	Esso Geneva	Esso Geneva	Tanker	149,608/307,235	Bah. '1
	Chevron Nagasaki	Tanker	118,147/268,244	Lib. '74	Esso Guatemala	Esso Guatemala	Tanker	17,218/29,364	Lib. '1
CSX CORPORATION Intersea Operation Inc. (Bahamas)	Kenneth T. Derr	Tanker	23,709/35,588	Bah. '82	Esso Hawaii	Esso Hawaii	Tanker	139,150/283,276	Bah. '1
	Sea Adventure	Container	17,618/15,417	Bah. '63	Esso Honolulu	Esso Honolulu	Tanker	139,150/283,399	Bah. '1
	Sea Leader	Container	17,618/15,417	Bah. '62	Esso Kachisiung	Esso Kachisiung	Tanker	54,537/91,621	Bah. '1
	Sea Pioneer	Container	17,618/15,417	Bah. '62	Esso Kawasaki	Esso Kawasaki	Tanker	149,608/307,432	Bah. '1
	Sea Lark	Container	6,654/12,085	Lib. '84	Esso Mexico	Esso Mexico	Tanker	54,563/91,741	Bah. '1
Marine RO-RO Feedships Corp.	Sea Link	Container	6,654/12,083	Lib. '83	Esso Nassau	Esso Nassau	Tanker	54,537/91,601	Bah. '1
	Santa Paula	Container	6,655/12,066	Pan. '83	Esso Palm Beach	Esso Palm Beach	Tanker	31,677/50,802	Bah. '1
	Shelly Bay Ltd.	Container	6,635/12,067	Pan. '83	Esso Providence	Esso Providence	Tanker	12,536/19,683	Lib. '1
	Sea Legend	Container	10,381/13,101	Sin. '78	Esso Puerto Rico	Esso Puerto Rico	Tanker	21,961/38,720	Bah. '1
	Sea Lotus	Container	10,382/13,101	Sin. '78	Esso Westernport	Esso Westernport	LP3 Tanker	57,630/66,769	Bah. '1
CALTEX PETROLEUM CORPORATION Caltex Tanker Co. (Australia) Pty. Ltd. Hal Investments (Australia)	World Lynx	Container	10,385/13,562	Lib. '79	Esso Bayonne	Esso Bayonne	Tanker	17,211/29,634	Sin. '7
	Arthur Phillip	Tanker	37,196/65,103	Aus. '74	Esso Coral Gables	Esso Coral Gables	Tanker	19,568/38,691	Sin. '7
	Australia Sky	Tanker	21,718/33,239	Aus. '89	Esso Jurong	Esso Jurong	Tanker	3,266/5,200	Sin. '8
	Australia Star	Tanker	54,656/94,783	Aus. '86	Esso Melbourne	Esso Melbourne	Tanker	17,829/28,963	Sin. '7
					Esso Orient	Esso Orient	LP3 Tanker	50,235/99,980	Sin. '7
CASTLE AND COOKE INC. Dole Fresh Fruit Int'l. Ltd.					Esso Tees	Esso Tees	Tanker	12,693/21,116	Sin. '7
	Limon	Reefer	6,709/7,244	Lib. '68	Esso Aberdeen	Esso Aberdeen	Tanker	58,394/112,834	UK '6
	Tropical Queen	Reefer	4,662/5,270	Lib. '68	Esso Avon	Esso Avon	Bitumen Tank.	1,599/3,134	UK '8
	Tropical Sun	Reefer	4,662/5,354	Lib. '68	Esso Clyde	Esso Clyde	Tanker	11,897/20,776	UK '72
	Tropical Estoril	Reefer	6,882/9,735	Lib. '74	Esso Fawley	Esso Fawley	Tanker	10,631/18,377	UK '67
OCP (Atlantic) Ltd.	Tropical Sintra	Reefer	6,881/9,736	Lib. '74	Esso File	Esso File	Tanker	75,536/123,481	UK '77
	Dole California	Container	16,488/11,613	Ita. '88	Esso Inverness	Esso Inverness	Tanker	2,144/3,419	UK '71
	Dole Costa Rica	Container	16,500/11,800	Ita. '91	Esso Mersey	Esso Mersey	Tanker	11,897/20,510	UK '72
	Dole Ecuador	Container	16,488/11,613	Ita. '88	Esso Milford Haven	Esso Milford Haven	Tanker	10,631/18,377	UK '68
					Esso Penzance	Esso Penzance	Tanker	2,144/3,402	UK '71
CHEMICAL TRUST CO. OF CAL.	Georgia S.	Bulk Carrier	15,462/30,187	Pan. '81	Esso Severn	Esso Severn	Tanker	12,316/20,776	UK '75
					Esso Tenby	Esso Tenby	Tanker	2,144/3,429	UK '70
CHEVRON CORPORATION Chevron Tankers (Bermuda) Ltd.					Esso Tyne	Esso Tyne	Tanker	13,340/22,333	UK '74
	Chevron Edinburgh	Tanker	118,179/268,336	Bri. '74	Esso Slagen	Esso Slagen	Tanker	9,752/18,797	Nor. '66
	Chevron No. America	Tanker	207,987/412,618	Bri. '76	Esso S.A. Petrolera Argentina	Esso Bahia Blanca	Tanker	12,806/22,504	Lib. '74
	Chevron So. America	Tanker	207,987/413,163	Bri. '76	Esso Formosa	Esso Formosa	Tanker	1,944/4,720	Arg. '70
	Alden W. Clausen	Tanker	23,709/35,587	Lib. '81	Esso Parana	Esso Parana	Tanker	1,007/2,470	Arg. '60
Chevron Transport Corp.	Carla A. Hills	Tanker	23,709/35,596	Lib. '81	Esso Rio Grande	Esso Rio Grande	Tanker	11,503/16,662	Lib. '82
	Charles B. Renfrew	Tanker	44,840/78,656	Bah. '88	Esso Rio Negro	Esso Rio Negro	Tanker	19,568/38,568	Lib. '75
	Chevron Antwerp	Tanker	122,627/276,798	Lib. '75	Esso San Lorenzo	Esso San Lorenzo	Tanker	1,944/4,720	Arg. '70
	Chevron Horizon	Tanker	60,491/123,965	Lib. '74	Esso San Sebastian	Esso San Sebastian	Tanker	21,619/38,998	Lib. '76
	Chevron Meteor	Tanker	60,886/127,506	Lib. '77	Esso Santa Cruz	Esso Santa Cruz	Tanker	21,619/39,039	Lib. '75
Chevron Pacific	Chevron Maru	Tanker	60,886/127,506	Lib. '77	Esso Yoshino Maru	Esso Yoshino Maru	Tanker	1,360/2,962	Jap. '84
	Chevron Perth	Tanker	23,709/34,950	Lib. '83	Esso Languedoc	Esso Languedoc	Tanker	126,186/256,699	Fra. '73
	Chevron Star	Tanker	122,627/276,840	Lib. '75	Esso Normandie	Esso Normandie	Tanker	137,578/274,333	Fra. '74
	Chevron Sky	Tanker	77,598/133,604	Lib. '76	Esso Parentis	Esso Parentis	Tanker	13,544/22,697	Fra. '73
	Chevron Star	Tanker	76,547/133,604	Lib. '77	Esso Picardie	Esso Picardie	Tanker	137,578/274,467	Fra. '76
Chevron Stream	Chevron Stream	Tanker	61,172/130,349	Lib. '75	Esso Port Jerome	Esso Port Jerome	Tanker	13,544/22,726	Fra. '72
	Chevron Sun	Tanker	76,547/156,299	Lib. '77	FAIRFIELD-MAXWELL LTD.				
	David Packard	Tanker	196,334/413,119	Lib. '77	Eurus Maritime S.A.	Galus	Freighter	5,548/7,036	Pan. '87
	Geo. H. Weyerhaeuser	Tanker	23,709/35,597	Bah. '81	Keilu	Keilu	Chem. Tanker	7,178/12,742	Pan. '87
	J. Dennis Bonner	Tanker	88,948/147,631	Lib. '91	Oahu Rex	Oahu Rex	Reefer	4,693/6,553	Pan. '86
Chevron International Ltd.	John Young	Tanker	88,948/152,403	Lib. '90	Oahu Re	Oahu Re	Reefer	4,963/6,530	Pan. '86
	Kenneth E. Hill	Tanker	43,428/81,274	Bah. '79	Sholu	Sholu	Reefer	4,936/6,532	Pan. '86
	R. Hal Dean	Tanker	44,840/78,656	Bah. '88	Sunbelt Dixie	Sunbelt Dixie	Car Carrier	11,447/12,730	Lib. '78
	Samuel H. Armacost	Tanker	23,709/35,608	Bah. '82	FIRESTONE TIRE AND RUBBER CO.				
	William E. Mussman	Tanker	43,428/81,274	Lib. '79	L&C II Ltd.	Harbel Cutlass	Freighter	8,753/11,733	Lib. '80
CHIQUITA BRANDS INTERNATIONAL CDY Ltd.	Chevron Ocean	Tanker	151,221/323,090	Lib. '74	L&C III Ltd.	Harbel Tapper	Freighter	8,148/11,683	Lib. '81
	Chevron Zenith	Tanker	48,645/96,712	Lib. '72	GREYHOUND CORPORATION				
	Edyth L.	Container	19,595/12,900	Bri. '90	Merchant Ships Trustees Ltd.	Starship Atlantic	Passenger	19,337/5,473	Lib. '82
	Frances L.	Container	19,595/12,900	Bri. '91	Noel Shipping Ltd.	Starship Majestic	Passenger	17,503/2,352	Bah. '72
	Chiquita King	Reefer	8,041/10,598	Bah. '80	Premier Cruise Line Ltd.	Starship Oceanic	Passenger	19,500/8,378	Bah. '65
CKO Ltd.	Chiquita Queen	Reefer	8,041/10,600	Bah. '80	INTERNATIONAL SHIPHOLDING CORP.				
	Chiquita Deutschland	Reefer	13,049/13,100	Bah. '91	Allied Ocean Carriers Inc.	Amazon	Bulk Carrier	76,906/140,832	Nor. '81
	Magnolia	Reefer	6,513/5,911	Bah. '72	Cypress Auto Carriers Inc.	Cypress Pass	Car Carrier	42,447/12,763	Lib. '88
	Margarita	Reefer	6,513/5,818	Bah. '73	Cypress Trail	Cypress Trail	Car Carrier	42,447/12,763	Lib. '88
	Mimosa	Reefer	6,513/6,127	Bah. '72	Rhine Forest	Rhine Forest	Barge Carrier	36,974/44,799	Lib. '72
Enterprises Shipping & Trading SA	Myria	Reefer	6,513/6,118	Bah. '73	Acadia Forest	Acadia Forest	Barge Carrier	33,231/47,564	Lib. '69
	Chiquita Milano	Reefer	8,254/9,398	Bah. '83	Atlantic Forest	Atlantic Forest	Barge Carrier	33,231/47,564	Lib. '70
	Chiquita Roma	Reefer	8,245/9,399	Bah. '83	Spruce	Spruce	Barge Carrier	1,380/8,040	Lib. '75

U.S. Parent Company Report Of Foreign Flag Merchant Ships (continued)

ENT COMPANY ect Owner	Name of Ship	Class	GT / DWT	Year Flag Built
IER CEMENT CORPORATION				
ian Carriers Inc.	Norman	Cement Carr.	3,771/5,939	Pan. '68
MA LTD.				
ios Shipping Ltd.	Amos	Bulk Carrier	14,070/27,029	Pan. '71
ivid Shipping Ltd.	David L.	Bulk Carrier	16,023/26,976	Lib. '73
endly Ocean Inc.	Joshua	Bulk Carrier	19,664/34,410	Lib. '76
as Shipping Ltd.	Papu	Bulk Carrier	14,743/25,530	Lib. '82
lena Shipping Corp.	Helena	Tanker	64,412/97,173	Lib. '75
nathan Shipping Ltd.	Jonathan	Bulk Carrier	19,202/33,311	Lib. '70
yla Shipping Ltd.	Deborah	Ore/Bulk/Oil	94,900/166,685	Lib. '73
ardi Shipping Ltd.	Ari	Bulk Carrier	14,798/25,630	Lib. '80
mega Consultants A/S	Sea King	Tanker	40,369/83,258	Lib. '74
ealife Shipping Inc.	Zachary	Bulk Carrier	15,977/26,510	Pan. '73
eamerit Inc.	Shimone	Bulk Carrier	14,611/27,469	Lib. '73
espolar Inc.	Sheeba	Bulk Carrier	13,061/22,920	Lib. '70
ncle Solomon Ltd.	Solomon	Bulk Carrier	19,107/33,311	Pan. '72
ega Shipping Co.	Prince Shaul	Freighter	8,695/14,938	Pan. '71
VIN ENTERPRISES				
ana Maui Corp.	Hana Maui	Bulk Carrier	15,742/27,112	Lib. '71
NUFACTURERS HANOVER TRUST OF N.Y. (Trustee)				
	Star Africa	Tanker	126,974/270,261	Bah. '74
	Star Baltic	Tanker	18,381/31,002	Bah. '76
	Star Bergen	Tanker	18,379/31,002	Bah. '77
	Star Pembroke	Tanker	18,378/31,002	Bah. '77
ARINE TRANSPORT LINES INC.				
Oswego Chemical Carriers Corp.	M.P. Grace	LPG Tanker	13,483/15,414	Lib. '67
	Savonetta	LPG Tanker	9,942/10,744	Lib. '64
	William R. Grace	LPG Tanker	9,954/10,750	Lib. '64
IARINE TRANSPORT INC./PENINSULAR & ORIENTAL STEAMSHIP NAVIGATION				
Rowbotham Tankships Ltd.	Astraman	Chem. Tanker	1,597/3,202	Isl. '73
	Bridgeman	Tanker	3,701/6,210	Isl. '72
	Cableman	Tanker	4,916/8,496	Isl. '80
	Eastgate	Tanker	1,599/3,415	Isl. '79
	Echoman	Chem. Tanker	3,759/6,125	Isl. '82
	Guidesman	Tanker	1,421/2,162	Isl. '80
	Helmsman	Tanker	3,705/6,165	Isl. '72
	Northgate	Tanker	1,599/3,290	Isl. '80
	Qarsman	Tanker	1,550/2,547	UK '79
	Orionman	Tanker	3,623/6,176	Isl. '75
	Pointsman	Tanker	2,886/4,694	Isl. '70
	Polarisman	Chem. Tanker	1,597/3,202	Isl. '73
	Quartermen	Tanker	1,226/2,135	Isl. '73
	River Shannon	Tanker	1,567/2,979	Isl. '70
	Tankerman	Tanker	5,881/10,716	Isl. '83
	Tillerman	Tanker	7,308/12,800	Isl. '75
	Westgate	Tanker	1,599/3,368	Isl. '79
	Wheelsman	Tanker	2,897/4,648	Isl. '67
MARU SHIPPING CO. INC.	Billie Fay	Bulk Carrier	17,959/30,653	Lib. '77
MOBIL OIL CORPORATION				
Matco Tankers (UK) Ltd.	Matco Clyde	Tanker	54,172/81,944	UK '82
Mobil Oil Australia Ltd.	Mawsan	Tanker	15,579/24,489	Aus. '72
	Tasman	Tanker	20,662/35,367	Aus. '90
	Athos	Tanker	140,745/276,221	Fra. '74
Mobil Oil Francaise	D'Arlagnan	Tanker	140,745/275,225	Fra. '74
Mobil Oil Reederie GMBH	Jade	Tanker	7,297/13,339	Ger. '75
Mobil Oil Singapore PTE Ltd.	Mobil Singapura	Tanker	1,998/3,523	Sin. '79
Mobil Overseas Shipping (Bermuda)	Aicides	Tanker	72,540/136,304	Bri. '71
	Harrier	Tanker	144,209/271,709	UK '75
	Mobilie Petrel	Tanker	139,092/280,428	Bri. '73
Mobil Shipping & Transport Co.	Astral	Tanker	60,946/127,505	Lib. '75
	Conastoga	Tanker	17,506/29,931	Lib. '72
	Corsicana	Tanker	17,505/29,931	Lib. '73
	Mobil Aladdin	Tanker	65,502/140,803	Lib. '74
	Mobil Challenge	Tanker	22,587/39,371	Lib. '83
	Mobil Flinders	Tanker	93,940/149,235	Aus. '82
	Mobil Swift	Tanker	119,969/272,494	Lib. '73
	Osprey	Tanker	104,362/227,756	Lib. '71
	Owl Transporter	Tanker	22,587/39,742	Lib. '83
	Pettros	Tanker	22,569/39,724	Lib. '84
	Royal Arrow	Tanker	22,587/39,776	Lib. '83
	Sachem	Tanker	18,258/31,102	Lib. '74
	Sacona	Tanker	19,580/38,481	Lib. '81
	Samoset	Tanker	19,580/38,529	Lib. '82
	Satucket	Tanker	18,861/30,397	Lib. '71
	Saucon	Tanker	19,590/38,452	Lib. '83
	Saudi Glory	Tanker	122,297/275,199	Lib. '74
	Saudi Splendour	Tanker	125,394/280,511	Lib. '75
	Sequoia	Tanker	18,843/32,590	Lib. '73
	Shabonee	Tanker	18,258/31,102	Lib. '74
	Wabasha	Tanker	50,222/81,278	Lib. '75
	Waneta	Tanker	41,135/81,282	Lib. '82
	Wapello	Tanker	41,135/81,283	Lib. '82
	Lubchem	Chem. Tanker	2,080/3,310	UK '73
	Matco Avon	Tanker	43,622/77,696	UK '64
	Matco Thames	Tanker	51,472/88,215	UK '76
MORTON INTERNATIONAL INC.				
Inagua Transports Inc.	Cecile Erickson	Salt Carrier	3,300/5,588	Stv. '57
NEW CONNECTICUT BANK & TRUST CO.				
	Europe	Tanker	122,395/276,050	Lib. '75
	Independence	Tanker	117,646/274,774	Lib. '76
NICOR INC.				
Birdsall Shipping S.A.	Tropic Jade	Ro-Ro	1,813/2,536	Stv. '78
	Tropic Key	Ro-Ro	1,786/2,530	Stv. '80
PARENT COMPANY	Name of Ship	Class	GT / DWT	Year Flag Built
	Tropic Lure	Ro-Ro	1,795/2,563	Stv. '83
	Tropic Mist	Ro-Ro	1,795/2,563	Stv. '83
Tropical Shipping & Constr. Co. Ltd.	Tropic Palm	Ro-Ro	2,844/4,734	Stv. '78
	Tropic Quest	Ro-Ro	7,949/9,969	Stv. '83
	Tropic Reign	Ro-Ro	7,947/9,793	Stv. '84
OCCIDENTAL CHEMICAL CORP. & D.S. VENTURES				
Oxychem Shipping Ltd.	Armand Hammer	Chem. Tanker	32,194/59,806	Mal. '67
OMI CORPORATION				
Connecticut Transport Inc.	Ocean Spirit	Tanker	39,534/61,391	Lib. '82
Ebro Transport Inc.	Ebro	Ore/Bulk/Oil	43,444/71,882	Lib. '78
Nile Transport Inc.	Nile	Tanker	33,932/65,689	Lib. '81
Sokolica Transport Inc.	Sokolica	Tanker	76,883/133,300	Lib. '75
Tagus Transport Inc.	General	LPG Tanker	42,461/49,882	Lib. '75
Volga Transport Inc.	Volga	Tanker	33,932/59,998	Lib. '81
OVERSEAS SHIPHOLDING GROUP INC.				
Amity Products Carriers Inc.	Julie N.	Tanker	18,965/29,994	Lib. '82
Anglomar Shipping Co. Ltd.	Tropical Lion	Tanker	122,376/256,387	Lib. '72
Ania Tanker Corp.	Ania	Tanker	78,244/135,134	Lib. '89
Atlantia Tanker Corp.	Atlantia	Tanker	42,155/81,278	Lib. '79
Canopus Tankers Inc.	Canopus	Tanker	18,402/31,509	Lib. '81
Chrimmir Shipping Corp.	Chrimmir	Bulk Carrier	31,243/62,185	Lib. '80
Columbia Tanker Corp.	Columbia	Tanker	144,139/258,076	Lib. '89
Commonwealth Shipping Co. Ltd.	Ulla	Bulk Carrier	17,228/29,399	Bri. '85
Concord Tanker SA	Concordia C.	Tanker	61,111/132,594	Pan. '76
Conti-OSG Associates III	Continental Reliance	Ore Carrier	30,151/65,224	Net. '83
Conti-OSG Associates IV	Continental Spirit	Ore Carrier	35,603/65,224	Net. '83
Delphina Tanker Corp.	Delphina	Tanker	22,972/39,674	Lib. '89
Diane Tanker Corp.	Diane	Tanker	38,241/64,140	Lib. '87
Edinburgh Bulk Carriers Inc.	Endeavor	Bulk Carrier	64,552/122,933	Bri. '75
Enterprise Shipping Co. Ltd.	Enterprise	Bulk Carrier	64,741/117,955	Bri. '73
Excelstor Bulk Carriers Ltd.	Excelstor	Bulk/Ore	64,141/122,200	Bri. '90
Exemplar Bulk Carrier Ltd.	Exemplar	Bulk/Ore	64,141/122,760	Bri. '90
First Alramax Tanker Corp.	Beryl	Tanker	52,518/84,406	Lib. '86
First Pacific Corp. and				
Second Pacific Corp.	Pacific Hunter	Tanker	18,736/32,109	Lib. '79
First Panamax Bulkcarriers Inc.	Meridian Sky	Bulk Carrier	36,042/64,293	Lib. '89
First Product Tankers SA	Lucy	Tanker	36,512/64,000	Lib. '86
First Shipco Inc.	Continental Friendship	Bulk Carrier	33,200/61,270	Lib. '77
Western Lion	Western Lion	Tanker	130,539/269,117	Lib. '74
Fourth Products Corp.	Neptune	Tanker	22,946/39,171	Lib. '89
Glasgow Bulk Carriers Co. Ltd.	Trudy	Bulk Carrier	17,228/29,432	Bri. '85
ITI Shipping S.A.	Ruth M	Tanker	60,815/30,257	Pan. '75
Intercont'l. Coal Transport Ltd.	Equinox	Ore Carrier	78,449/138,820	Bri. '82
Interocean Tankers Corp.	Southern Lion	Tanker	126,850/269,085	Lib. '75
Island Tankers S.A.	Shirley	Tanker	60,815/130,286	Pan. '75
Jostelle Shipping Co. Ltd.	Jostelle	Bulk Carrier	63,863/122,970	Bri. '75
Loire Carbulk Carriers Inc.	Argus Traveler	Bulk Carrier	20,515/33,013	Lib. '75
Marina Tanker Corp.	Mary Ann	Tanker	38,241,64,239	Lib. '86
Matilde Tanker Corp.	Matilde	Tanker	78,344/135,134	Lib. '89
Oleoron Tanker S.A.	Vesta	Tanker	42,048/81,278	Pan. '80
Olympia Tanker Corp.	Olympia	Tanker	144,139/258,076	Lib. '90
Overseas Coal Transport Ltd.	Esplanade	Ore Carrier	76,449/138,787	Bri. '82
Pluto Tankers Inc.	Pluto	Tanker	18,402/31,303	Lib. '81
Saturn Bulk Carriers Inc.	Saturn	Bulk Carrier	31,243/62,212	Lib. '80
Second Alramax Tanker Corp.	Eliane	Tanker	52,524/84,323	Lib. '87
Second Panamax Bulkcarriers Inc.	Caribbean Sky	Bulk Carrier	36,042/64,282	Lib. '89
Second Products Tankers Inc.	Suzanne	Tanker	36,512/65,000	Lib. '86
Second United Shipping Corp.	Northern Lion	Tanker	126,851/269,077	Lib. '74
Third Products Tankers Inc.	Uranus	Tanker	22,946/39,451	Lib. '88
Third United Shipping Corp.	Eastern Lion	Tanker	126,796/269,184	Lib. '73
Tiber Carbulk Carriers Inc.	Argus Explorers	Bulk Carrier	20,513/33,046	Lib. '75
Timor Navigation Ltd.	Northern Light	Bulk Carrier	31,007/65,592	Lib. '81
Trader Shipping Corp.	Esperanza	Ore Carrier	31,814/66,136	Lib. '73
Vega Tanker Corp.	Vega	Tanker	22,972/39,710	Lib. '89
Venus Tankers Corp.	Venus V	Tanker	42,048/97,531	Lib. '81
PHILLIPS 66 NATURAL GAS / USX-MARATHON				
Arctic LNG Transportation Co.	Arctic Tokyo	LNG Tanker	44,089/32,878	Lib. '69
Polar LNG Shipping Corp.	Polar Alaska	LNG Tanker	44,089/32,878	Lib. '69
SECURITY PACIFIC NATIONAL BANK (Trustee)				
Chevron Burnaby	Chevron Burnaby	Tanker	122,627/276,778	Lib. '75
TANKSHIP TRANSPORT LTD.				
Empress Partners Ltd.	Sea Empress	Tanker	211,359/423,700	Bah. '76
TEXACO INC.				
Texaco Panama Inc.	Star Houston	Tanker	66,816/136,100	Lib. '75
	Star Kansas	Tanker	65,407/124,897	Bah. '76
	Star Louisiana	Tanker	65,407/114,001	Bah. '75
	Star Scandinavia	Tanker	12,907/20,300	Bah. '62
	Star South America	Tanker	130,959/268,535	Lib. '76
	Star Tulsa	Tanker	67,244/131,350	Lib. '71
Refineria Panama S.A.	Taboga	Tanker	2,978/6,868	Pan. '71
Texaco Overseas Tankship Ltd.	Star Westminister	Tanker	49,809/79,999	UK '81
	Star Windsor	Tanker	49,809/79,997	UK '80
TEXACO COMMERCE BANK N.A. (Trustee)				
Star Japan	Star Japan	Tanker	129,973/263,516	Pan. '75
USG CORPORATION				
Gypsum Transportation Ltd.	A.V. Kastner	Bulk Carrier	12,702/18,699	UK '87
	Gypsum Baron	Bulk Carrier	12,839/18,314	UK '76
	Gypsum King	Bulk Carrier	12,839/18,314	UK '75
WILMINGTON TRUST CO.	Brooklyn	Tanker	103,907/229,727	Mis. '73

U.S. PARENT COMPANY, FOREIGN FLAG MERCHANT SHIPS												
(AS OF JANUARY 1, 1993)												
Flag of Registry	TOTAL			FREIGHTERS*			BULK CARRIERS			TANKERS		
	No. Ships	Gross Tons	Deadweight Tons	No. Ships	Gross Tons	Deadweight Tons	No. Ships	Gross Tons	Deadweight Tons	No. Ships	Gross Tons	Deadweight Tons
	324	14,256,301	26,905,464	56	656,380	630,129	48	1,596,258	2,838,212	220	12,003,663	23,437,123
LIBERIA	155	7,718,963	14,705,746	18	294,884	290,181	27	834,739	1,437,785	110	6,589,340	12,977,780
BAHAMAS	49	2,543,831	4,691,273	19	218,584	178,290	—	—	—	30	2,325,247	4,512,983
BRITISH DEP. TER.	15	1,377,952	2,715,082	—	—	—	9	508,792	945,256	6	869,160	1,769,826
FRANCE	7	709,920	1,402,368	—	—	—	—	—	—	7	709,920	1,402,368
PANAMA	20	434,327	843,998	7	46,645	65,722	5	68,387	122,976	8	319,295	655,300
UNITED KINGDOM	23	647,776	1,111,592	—	—	—	3	38,380	55,327	20	609,396	1,056,265
AUSTRALIA	6	243,751	402,216	—	—	—	—	—	—	6	243,751	402,216
SINGAPORE	9	143,553	253,309	2	20,763	26,202	—	—	—	7	122,790	227,107
NORWAY	2	86,668	159,629	—	—	—	1	76,906	140,832	1	9,762	18,797
MARSHALL ISLANDS	1	103,907	229,727	—	—	—	—	—	—	1	103,907	229,727
ARGENTINA	3	4,895	11,910	—	—	—	—	—	—	3	4,895	11,910
NETHERLANDS	2	65,754	130,448	—	—	—	2	65,754	130,448	—	—	—
ISLE OF MAN	17	50,881	89,783	—	—	—	—	—	—	17	50,881	89,783
MALTA	1	32,194	59,806	—	—	—	—	—	—	1	32,194	59,806
ITALY	3	49,476	35,026	3	49,476	35,026	—	—	—	—	—	—
ST. VINCENT	8	29,328	40,296	7	26,028	34,708	1	3,300	5,588	—	—	—
GERMANY	1	7,297	13,339	—	—	—	—	—	—	1	7,297	13,339
FINLAND	1	4,468	6,954	—	—	—	—	—	—	1	4,468	6,954
HONDURAS	—	—	—	—	—	—	—	—	—	—	—	—
JAPAN	1	1,360	2,962	—	—	—	—	—	—	1	1,360	2,962
*Includes 3 passenger ships.												
Source: Maritime Administration												

*Includes 3 passenger ships.
Source: Maritime Administration

U.S. PARENT COMPANY, FOREIGN FLAG MERCHANT SHIPS UNDER CONSTRUCTION OR ON ORDER							
(AS OF JANUARY 1, 1993)							
U.S. Parent Company Direct Owner/Hull No./Name	No. Ships	Class	Where Building	Gross Tons	Deadweight Tons	Flag Of Registry	Due Date
Grand Total:	28			1,079,450	2,037,800		
AMOCO CORPORATION	1						
2059 (Mitsubishi)		Tanker	Japan	144,500	289,000	Lib.	June '93
CASTLE AND COOKE INC.	2						
(Singapore S & E)		Ro-Ro	Singapore	Unk.	Unk.	Unk.	Feb. '93
(Singapore S & E)		Ro-Ro	Singapore	Unk.	Unk.	Unk.	June '93
CHEVRON CORPORATION	5						
163 (Ishibras)		Tanker	Brazil	352,500	705,000		
164 (Ishibras)		Tanker	Brazil	75,000	150,000	Lib.	Sept. '93
(Ishibras)		Tanker	Brazil	75,000	150,000	Lib.	June '93
(I.H.I.)		Tanker	Brazil	66,000	132,000	Lib.	Oct. '93
(Astano)		Tanker	Japan	74,000	148,000	Lib.	Mar. '93
CHIQUITA BRANDS INTERNATIONAL INC.	10						
710 (Danyard)		Reefer	Denmark	121,100	121,100		
711 (Danyard)		Reefer	Denmark	13,100	13,100	Bah.	Mar. '92
712 (Danyard)		Reefer	Denmark	13,100	13,100	Bah.	June '92
714 (Danyard)		Reefer	Denmark	13,100	13,100	Bah.	Sept. '92
1061 (Sch. Seebeckwft)		Reefer	Germany	13,100	13,100	Bah.	Nov. '92
1061 (Sch. Seebeckwft)		Reefer	Germany	12,350	12,350	Bah.	Dec. '92
115 (Kvaerner Kleven)		Reefer	Germany	12,350	12,350	Bah.	Mar. '93
116 (Kvaerner Kleven)		Reefer	Norway	11,000	11,000	Bah.	Feb. '92
(Kvaerner Kleven)		Reefer	Norway	11,000	11,000	Bah.	'91
(Kvaerner Kleven)		Reefer	Norway	11,000	11,000	Bah.	Dec. '92
(Kvaerner Kleven)		Reefer	Norway	11,000	11,000	Bah.	Dec. '92
CONOCO INC.	4						
1083 (Samsung Sb.)		Tanker	South Korea	190,000	380,000		
1084 (Samsung Sb.)		Tanker	South Korea	47,500	95,000	Lib.	Feb. '92
(Samsung Sb.)		Tanker	South Korea	47,500	95,000	Lib.	Apr. '92
(Samsung Sb.)		Tanker	South Korea	47,500	95,000	Lib.	July '93
MARINE TRANSPORT LINES	2						
(Malaysai Shpyd.)		Tanker	Malaysia	6,200	12,400		
(Malaysai Shpyd.)		Tanker	Malaysia	3,100	6,200	IsM.	Dec. '92
MOBIL OIL CORPORATION	1						
1185 (Sumitomo H.I.)		Tanker	Japan	3,100	6,200	IsM.	Feb. '93
OMI CORPORATION	1						
N2022 (Mitsubishi)		Tanker	Japan	140,000	280,000	Lib.	Dec. '93
PHILLIPS 66 NATURAL GAS / GAS USX-MARATHON	2						
3015 (I.H.I.)		LNG Tanker	Japan	70,150	140,300	Lib.	Mar. '91
3016 (I.H.I.)		LNG Tanker	Japan	70,150	140,300	Lib.	Mar. '91

Source: Maritime Administration

IC Awards Contract Samson Tug & Barge worth \$10 Million

The Navy's Military Sealift Command (MSC) has awarded a \$10 million contract to Samson Tug and Barge, of Seattle, Wash., for U.S. g liner service.

Escape Path Lighting for Cruise Ships Meets SOLAS Specifications

Loctite Luminescent Systems, Inc. (LLS), a leading supplier of escape path lighting for the commercial airline industry, has now developed a low location lighting system that meets the current proposed SOLAS specifications for cruise ships.

The proposed regulations require all new hulls as of 1994 to be equipped with low location lighting by 1997. LLS's Lifeline electroluminescent (EL) lighting system, a solid-state source of surface illumination, meets the proposed SOLAS specifications and UL1994 standards.

EL is reported to be one of the most effective sources of lighting or escape path marking because it is an area of source illumination with light emitted from the entire surface of the luminescent strips. Extensive military tests have proven that EL light is more readily seen through smoke than incandescent or other point sources of light.

Using EL light that does not require bulbs or filaments, the LLS Lifeline system can withstand extremes of shock, vibration and temperature changes without failure. The system is now being used on oil rigs in the North Sea.

According to Loctite, installing this Lifeline system in cruise ships is a logical extension of a well-established product.

Salco Introduces Intrusion Security System For Ships

Salco Industries, Sarasota, Fla., recently announced the availability of its Security Control Panel for applications in large vessels such as tankers, ferries, cruise liners, military ships, megayachts and gaming vessels.

Developed for the U.S. Coast Guard, the system M-800 incorporates the latest advancements in microcomputer technologies to function in hostile marine environments and which is housed in a weather-proof enclosure. The M-800 is capable of monitoring eight hard-wired protective sensors.

When activated, the system activates a siren and communicates the alarm via telemetry radio to a rapid deployment wireless receiver processor located up to five miles away. When in port the receiver processor

Model RDS-8LR is carried wherever you go and is always functioning in-transit on back-up battery.

Coast Guard Issues Final Rule For Prince William Sound Pilotage

The U.S. Coast Guard issued a

final rule that requires most vessels entering Alaska's Prince William Sound to have two licensed officers on the bridge if a federal pilot is not on board.

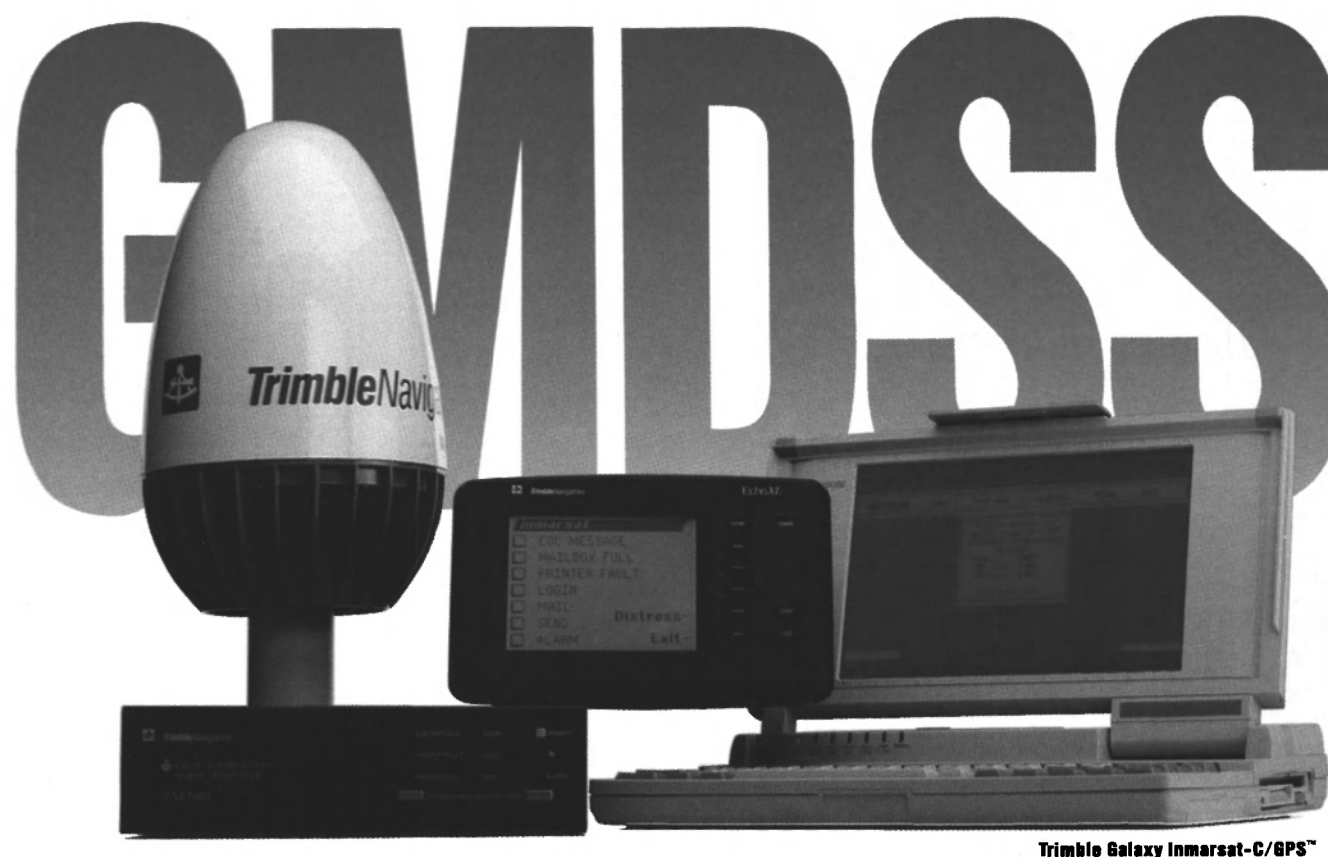
The rule became effective April 9, and is mandated by the Oil Pollution Act of 1990. It provides for the safety of pilots by recognizing the danger of attempting to board large vessels from small pilot boats in the treacherous waters of the Sound's

entrance.

The rule also requires that a pilot with a federal license, who is not a member of the vessel's crew, be on board the vessel when it is navigating between Bligh Reef and the port of Valdez. Bligh Reef is the site of the 1989 Valdez oil spill.

The final rule, published in the Federal Register, may be obtained by calling (202) 267-6740 or by faxing requests to (202) 267-4624.

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The tracking and communication capabilities of Galaxy give fleet operators a powerful new tool for managing their ships. The home office can broadcast up-to-the-minute routing information to specific ships, redirecting them to suit changing

business opportunities. And since messages from the ship can include GPS position, the office can precisely monitor the movements of every ship in the fleet.

In an emergency, the push of a button on the Galaxy remote alert panel transmits a distress message to the selected Rescue Coordination Center. Included are the ship's identity, its position, speed, course, and the time and type of distress. No time is wasted, and with GPS position information rescuers will know right where to look.

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Minimum Standards Set By Ship Insurer Group

New rules on minimum operating standards have been set by Standard Steamship Owners' Protection & Indemnity Association (Bermuda) Ltd. due to the recent dramatic increase in maritime accidents.

The Standard Club is expecting that members have written procedures to follow on the expected per-

formance of officers and crew and on the operation and management of each ship. The Standard Club currently provides liability coverage for about 3,000 vessels.

The Standard Club has compiled a list of recommended publications covering international industry standards that ships should make available to its crew. Other standards set by the club are that each ship should have a regular maintenance schedule, a safety policy as well as a safety

officer, and a contingency plan to cover major casualties.

Presently, the club claims that approximately one-quarter of its members do not have guidelines or procedures for its crew concerning the testing of navigation equipment, staffing the engine room and bridge, and checking cargo hatches, among other important and necessary tasks.

Members of the Standard Club include J. Lauritzen A/S, Blue Star Line Ltd., Carnival Cruise Lines Inc.,

and Canada Steamship Lines. The club cites the poorly maintained, aging fleet crewed by unqualified disloyal workers as reasons for deteriorating operational standards.

Hollywood Marine Earns ISO 9002 Certification

Houston-based Hollywood Marine, Inc. became certified to the ISO 9000 series of international quality standards. The certification was awarded by ABS Quality Evaluations, Inc.

Hollywood Marine is one of the largest tank barge companies in the U.S. Its 600 employees operate a fleet of more than 225 tank barges and 100 towboats serving the petroleum, chemical, LPG, black oil and ship bunkering markets.

ABS Quality Evaluations, Inc. and its quality mark are part of the 130-year tradition of the worldwide American Bureau of Shipping, one of the world's leading marine classification societies and a longstanding proponent of quality assurance in the marine industry.

Decommissioning Proposed For Great Lakes Icebreaker

The Coast Guard's icebreaker Mackinaw (WAGB-83), based in Cheboygan, Mich., will be decommissioned at the end of next year's icebreaking season, pending approval of the Coast Guard's fiscal year 1994 budget by Congress.

At 290 feet, and displacing 5,340 tons, the cutter Mackinaw is the largest Coast Guard vessel on the Great Lakes.

The decision to decommission the 50-year-old Mackinaw is based on the age of the vessel, its annual operating costs, and the need for engineering and habitability upgrades, an option which would cost approximately \$15 million.

The annual operating cost of the Mackinaw is approximately \$5 million, including \$2.2 million in salary and benefits for the 75-person crew, and about \$500,000 in fuel costs. The remainder of the \$5 million is required for general operating expenses.

The Mackinaw, built in Toledo, Ohio in 1944 at a cost of \$10 million, was commissioned to keep the shipping lanes open on the Great Lakes during the winter months.

As the Coast Guard introduced five new 140-foot Bay Class cutters on the Lakes in the 1980's, it became apparent that they could accomplish the icebreaking mission nearly as well as the Mackinaw at an annual operating cost of \$900,000 per vessel. They are able to break ice in about 95% of the situations encountered by the Mackinaw, but more efficiently.

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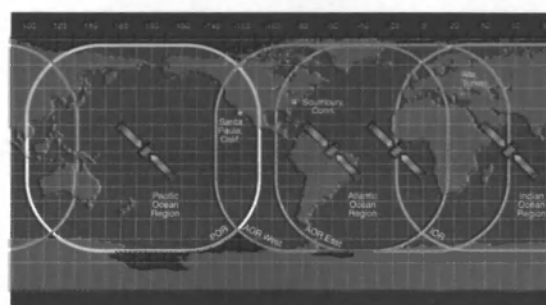
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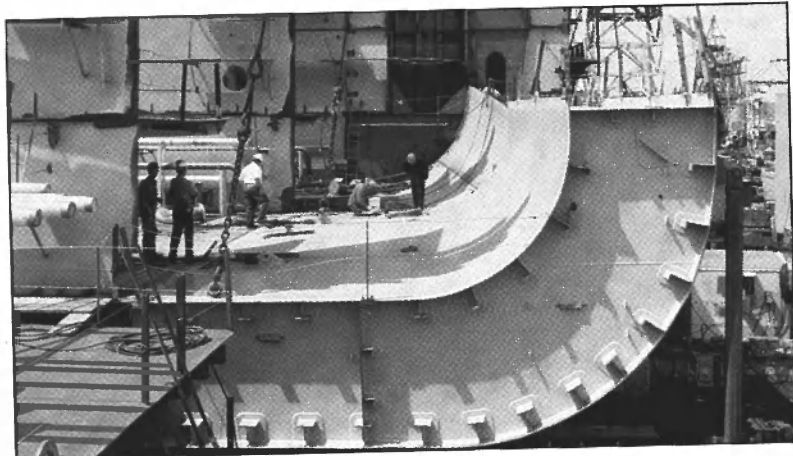
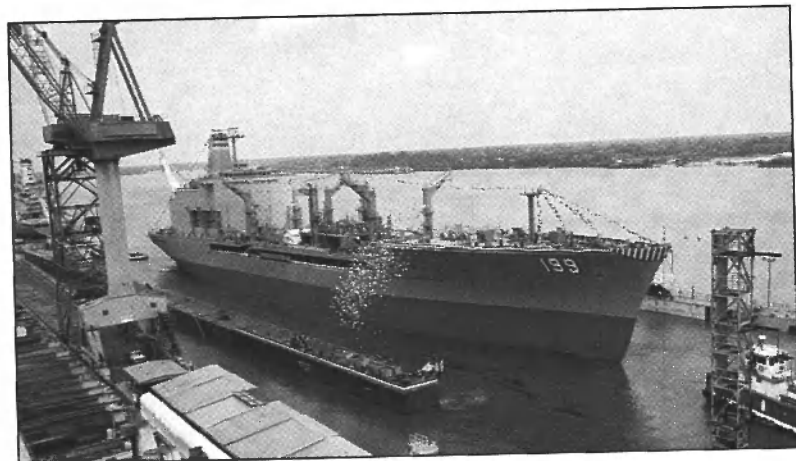
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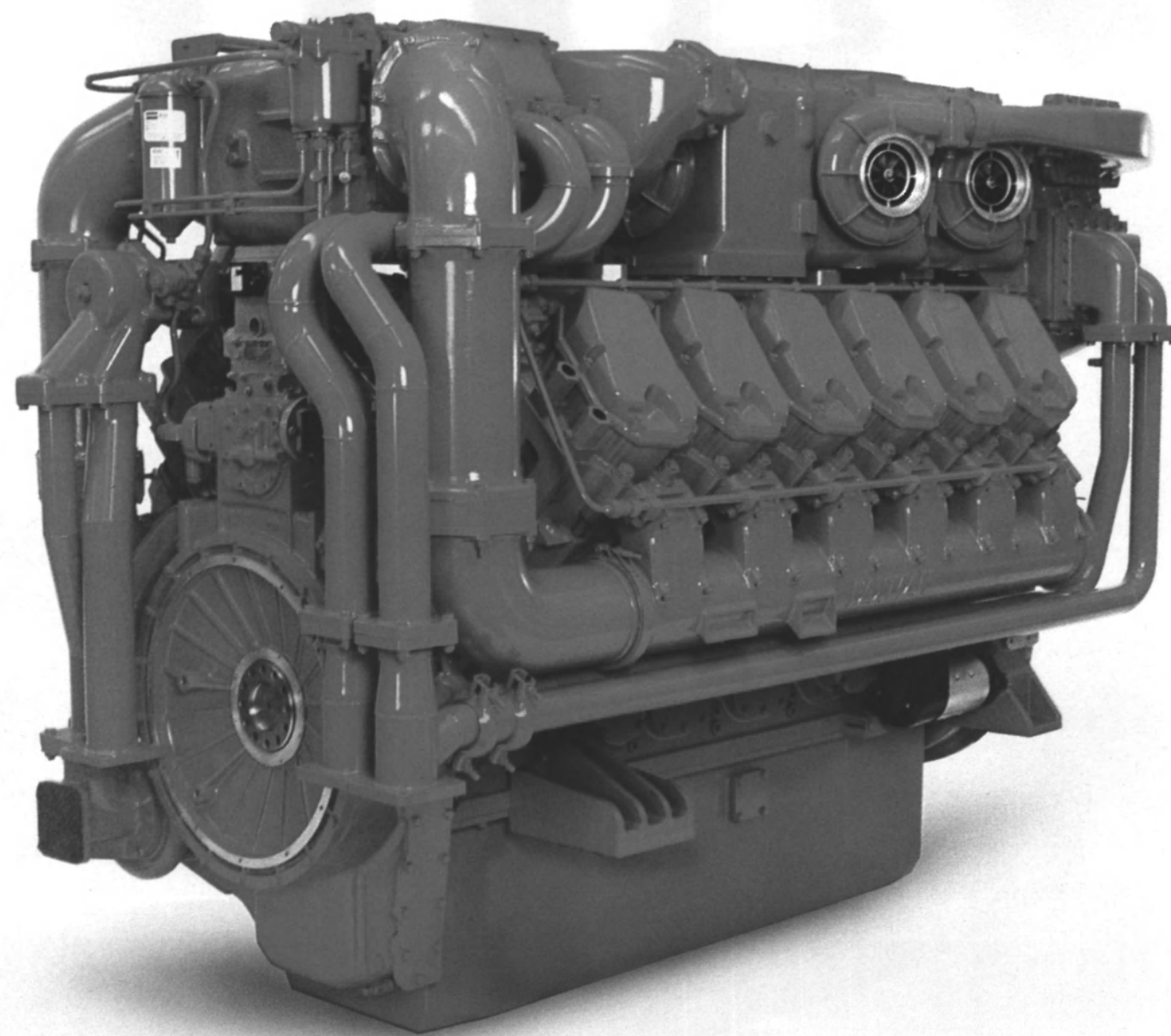


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G E C A L S T H O M

PAXMAN DIESELS

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ernotional Marine rriers Awarded ARAD Contract

International Marine Carriers, c. (IMC), a world leader in ship management and marine transportation services, has been awarded a contract by the Maritime Administration (MarAd) - the latest in a series of major assignments given the firm. The new contract calls

for IMC's services to MarAd for three Ro/Ro vessels which will become part of the Ready Reserve Fleet. This six-phase program prompted an expansion of its staff to include additional marine technical and administrative members.

Phase I of the MarAd contract, which is already underway, has IMC surveying the vessels in order to verify all modifications and upgrades necessary for registering the vessels in the U.S. During Phase II of the contract, IMC will be accepting de-

livery of all vessels on behalf of MarAd at U.S. ports. Phase III will consist of specification preparation for the vessel's refitting, equipment renewal or modification, drydocking and general repairs, activation and sea trials, and deactivation for placement into the Ready Reserve Fleet. Phase IV will involve the awarding of a contract to a shipyard to accomplish the tasks set forth in Phase III. In Phase V, IMC will manage and supervise all refitting and repairs being per-

formed in the shipyard. In the final phase, IMC will assume management of the day-to-day operations of the vessels while in the Ready Reserve Fleet.

The three vessels were built in 1977 at Kawasaki Heavy Industries (Japan) and are 648 feet long with a beam of 105 feet and a gross tonnage of 14,483. Incorporating twin medium speed Kawasaki/MAN diesel engines with a maximum horsepower of 28,000, their normal design service speed is 18 knots.



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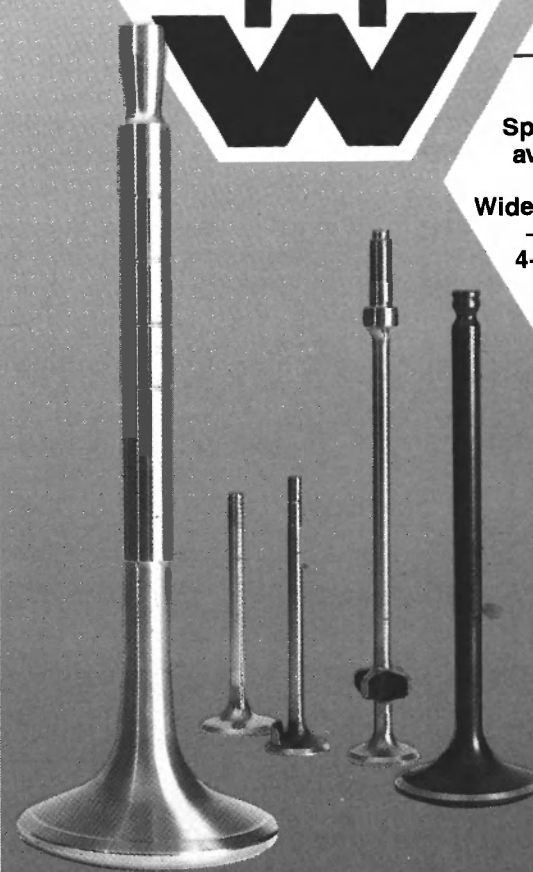
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Cerberus Pyrotronics Receives USCG Certification For Life Saving System

Cerberus Pyrotronics of Cedar Knolls, N.J. received U.S. Coast Guard approval for its MXL early warning life safety fire system. This certification provides Cerberus Pyrotronics with exclusive analog fire detection service certification

for marine applications in the U.S. The MXL is an integrated fire safety system offering dynamic supervision of all devices. This supervision includes calibration readings, voltages, device type and pinpoint location.

The MXL is one component of Cerberus Pyrotronics' IntelINK systems and services. These systems are intelligently linked through the power of computer technology.

For more information about the MXL fire safety system,

Circle 13 on Reader Service Card

Passenger Vessel Safety Act Approved

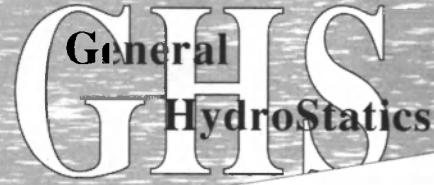
The Passenger Vessel Safety Act of 1993 (H.R. 1159) was approved by

the Subcommittee on Coast Guard and Navigation after one amendment was added.

Under current law, passenger vessels weighing more than 100 gross tons which carry one or more passengers for hire must meet Coast Guard requirements, be Coast Guard documented as a passenger vessel and be Coast Guard inspected. In the past, vessel owners have avoided Coast Guard regulation using recreational vehicles which are not required to be Coast Guard inspected.

H.R. 1159 will require all passenger carrying vessels to be licensed by the Coast Guard, chartered vessels to obtain some form of passenger vessel certification and/or safe inspection, and will give the Coast Guard the authority to regulate non-recreational vessels in the passenger carrying trade.

The only amendment attached to the bill would require that all chartered vessels of over 100 gross tons carrying 12 or less passengers receive a Coast Guard document and would be subject to general safety lifesaving and firefighting equipment requirements. The same restrictions would apply to chartered vessels weighing less than 100 gross tons but are limited to six passengers.



1993 Prediction...

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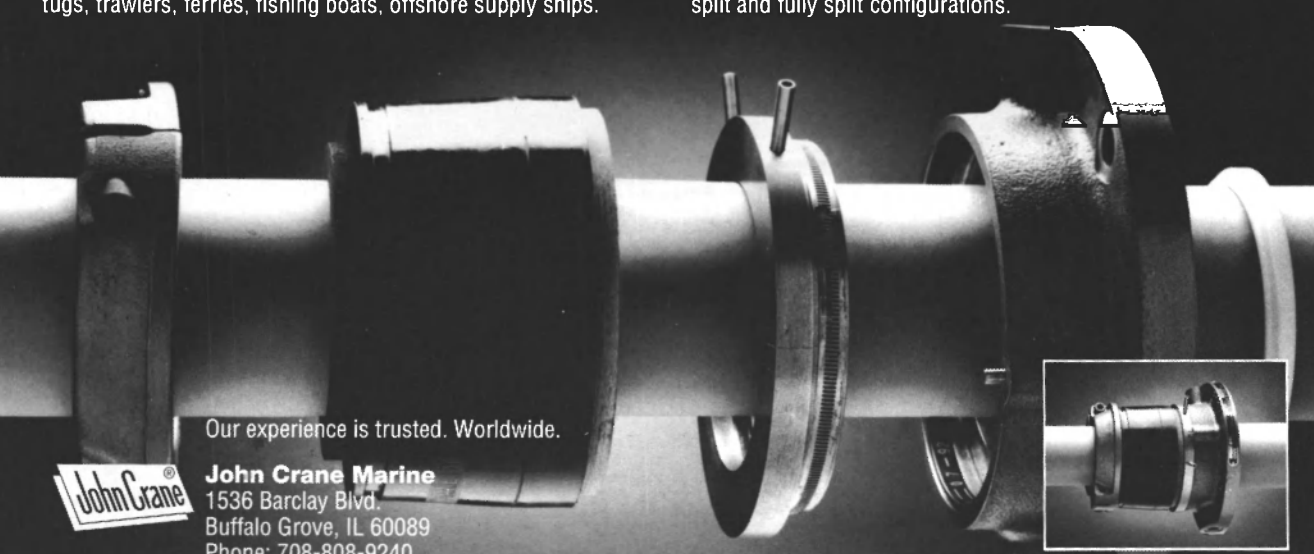
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Corroless Anti-Corrosion System From Unitor

Corroless International and Unitor's Maritime Division have joined together to meet the corrosion control requirements of the shipowner and fleet operator.

Corroless International's marine corrosion specialists and experienced project management teams are ready to provide the most effective solutions to all marine corrosion problems. With 59 branch offices supplying more than 800 port locations throughout the world, Corroless International and the Unitor network can provide high performance, anti-corrosion systems directly to your fleet, whenever and wherever they are required.

Corroless Rust Stabilisers contain an active anti-corrosion pigment which stabilises firmly-adherent rust, creating an inert layer of magnetite and eliminating virtually all sub-film corrosion. Corroless Reinforced Finishes use a patented technique of self-leaving glassflakes to form a protective barrier against chemicals, abrasion and aggressive environments. Corroless Corrosion Inhibitors can be incorporated into a wide range of media to reach and control inaccessible areas of corrosion damage.

For more information on Corroless Anti-Corrosion System,

Circle 12 on Reader Service Card

Maritime Reporter/Engineering News

Wartsila Introduces Ship Machinery Documentation System

Eldoc™, Wartsila Diesel's new electronic documentation integration system for on-board machinery, was the featured topic at a recent joint meeting of the Society of Naval Architects and Marine Engineers, New York Metropolitan Section, and the Institute of Marine Engineers. **Karl F. Yannes**, vice president responsible for Marine Engines for Wartsila Diesel North America, presented elements of the system and explained its features.

Eldoc™ is designed to provide immediate, on-line access to comprehensive ship documentation through an interactive, easy-to-use computer interface. Maintenance manuals, spare parts catalogs, plus Wartsila's existing diesel engine and ship monitoring systems are all instantly accessible by the user. Eldoc uses a Microsoft® Windows™ format and digital video to display maintenance procedures. According to Mr. Yannes, the interactive feature allows users to access information from several different files as needed, thus providing an easy, efficient guide to maintenance and repair problems. The video feature adds a new dimension to troubleshooting, with users able to observe the action - not simply still images. "With Eldoc, users finally have a system that operates the way people actually think. They are truly amazed at how simple the system is to use," Mr. Yannes notes.

For more information on Wartsila's Eldoc system,

Circle 14 on Reader Service Card.

Selantic Introduces New Lifesaving Evacuation System

Selantic Industrier A/S will be presenting its new design of SES-3 Marine Evacuation System for cruise ships, passenger ferries and cargo vessels.

The Selantic Evacuation System SES-3 ensures safe evacuation for passengers of all ages. Based upon trials and tests, this high capacity MES allows 350 persons to evacuate in a single chute, in accordance with the SOLAS requirements. To meet the new demands for high capacity MES for the new designs of high speed vessels, Selantic has developed a new SES-3 Twin Chute which evacuates 400 persons in well under 20 minutes, it was reported.

The Selantic Evacuation System is a self-contained, totally integrated unit occupying very little deck space. The user friendly operation with controlled launching offers the option of lowering the system as a one batch unit, including the number of liferafts fulfilling the capacity of the MES system.

Selantic Evacuation Systems are easily installed inboard or outboard on all types of vessels with no limitation to freeboard height.

Based on several years of experience on offshore installations in the North Sea, Selantic Evacuation System SES-3 is a safe evacuation solution for passenger ferries and cruise ships, and contributes to increasing the safety on board for each and every passenger and crew member.

For more information on Selantic,

Circle 8 on Reader Service Card

Weeks Marine, Jamestown Marine Announce Consolidation

Weeks Marine, Inc. and Jamestown Marine Services announced a consolidation of assets and experience to meet salvage and firefighting response requirements of OPA 90.

Weeks Marine and Jamestown Marine have participated in the salvage response operations of the Exxon Valdez, the World Prodigy, the American Trader and the Bahia Paraiso. Most recently they have worked together in response to the Chiarrá, grounded in Buzzard's Bay in December 1992.

Weeks Marine, Inc. of Cranford, N.J., presently owns and operates the largest salvage fleet on the eastern seaboard.

Its salvage fleet consists of more than 20 vessels, 120 barges, more than 40 floating cranes and Derrick rigs with heavy lift capacities up to 700 tons, and all necessary auxiliary equipment.

Jamestown Marine Services of Jamestown, R.I., is a marine services company of unique ability, especially in salvage engineering, naval architecture and salvage operations.

Jamestown Marine assisted with the development of the U.S. Navy Program of Ship Salvage Engineering, marketed commercially as HECSALV.

For firefighting response, Weeks/Jamestown is standing up a salvage action response team (SART), highly portable (by helicopter or over the road to the nearest port), self contained with pumps, foam, and prepackaged life support

and firefighting equipment.

The combination of equipment and experience places Weeks/Jamestown in the forefront of salvage and firefighting response.

For more information on Weeks Marine

Circle 6 on Reader Service Card

For more information on Jamestown Marine

Circle 7 on Reader Service Card

Kvaerner Enters In Cooperation Agreement With Russian Shipyard

Kvaerner A/S, the Norwegian shipping, offshore and mechanical engineering firm, has concluded a cooperation agreement with the Russian Sever shipyard at Severodvinsk.

The agreement covers development of expertise at the Russian yard and fabrication of offshore structures, fish processing equipment and fishing vessels. Production pursued under the agreement will be divided between Norway and Russia, which Kvaerner says will help the Russian yard in its conversion from naval to civilian production. Kvaerner has been in discussions for some time with the naval shipyards in Severodvinsk to develop petroleum fields on the Russian continental shelf.

Kvaerner A/S is a shipping, offshore and mechanical engineering firm in Norway.

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Drew's MAGNAKOTE® Rust Preventative Receives ABS Approval

Adding to a list of certifications from major classification societies and organizations worldwide, Drew Ameroid Marine's MAGNAKOTE® rust preventative has been awarded a "Type Approval" for corrosion protection of ballast tanks and void spaces by the American Bureau of

Shipping (ABS).

Other organizations that have formally recognized Drew's rust preventative include: Det Norske Veritas, Germanischer Lloyd, The Register of Shipping (formerly USSR Register of Shipping), the Polish Ship Register, the Korean Register of Shipping and Nippon Kaiji Kyokai.

MAGNAKOTE penetrates through oxidized deposits and bonds to the base metal, forming a long-lasting barrier that halts new corro-

sion as it descales existing rust. The rust preventative requires minimal surface preparation, can be easily applied by either float-coating or spraying, and cures within 48 hours to a transparent film that facilitates inspection.

It remains flexible after curing and will not crack or peel like conventional coatings. Areas prone to severe abrasion or exposure can be easily touched up, if needed; hot work can be done in treated tanks.

For more information on MAGNAKOTE rust preventative

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Coast Guard Publishes Next OPA 90 Rulemaking

In response to section 4109 of OPA 90, a Notice of Proposed Rulemaking (NPRM) concerning minimum plate thicknesses and periodic gauging of tank vessels was published in the Federal Register on March 23, 1993. The proposed regulation will apply to all tank vessels carrying petroleum oil cargoes and will require periodic gauging of these vessels beginning at 30 year of age and re-gauging every five years thereafter.

Although the regulations apply to all tank vessels, both domestic and foreign, they will most directly affect the domestic U.S. unclassified tank vessel fleet, estimated to be 2,643 barges and 37 tankers. The age profile of that fleet suggests that the average service life of an unclassified tank vessel is 50 years; 45 percent of the fleet is already more than 30 years old.

The proposed regulations establish minimum steel thicknesses for various structural members and plating on a tank vessel. Beginning at age 30, and every five years thereafter, these vessels must be gauged to demonstrate that the minimum steel thickness and longitudinal strength requirements are being met. The Coast Guard estimates that the initial gauging survey and engineering analysis will cost \$4,000 per barge and that subsequent surveys will cost \$3,000. The five-year re-gauging interval is intended to allow the gauging surveys to coincide with the vessel's normal drydocking schedule, thus avoiding any additional lost time out-of-service.

The minimum thickness requirements will be effective immediately and apply to all tank vessels of any age. The periodic gauging requirements will be phased in over a period of approximately three and a half years.

Vickers Seeks MarAd's Permission To Sell Barge

The Maritime Administration has received an application from Vickers Towing Co., Inc., Lake Ferguson, Greenville, Miss., for permission to sell the 1,579-gt tank barge DON to Compania Central Financiera Importadora Y Exportadora S.A., Panama City, Panama. The vessel would be registered in Argentina, Panama, or Paraguay.

The vessel was built in 1971 in Neville Island, Pa. It will be used in movement of petroleum products on the Panama and Paraguay Rivers in Argentina and Paraguay, and other rivers in South America.

MarAd's permission is required by section 9 of the Shipping Act of 1916, as amended.

Maritime Reporter/Engineering News

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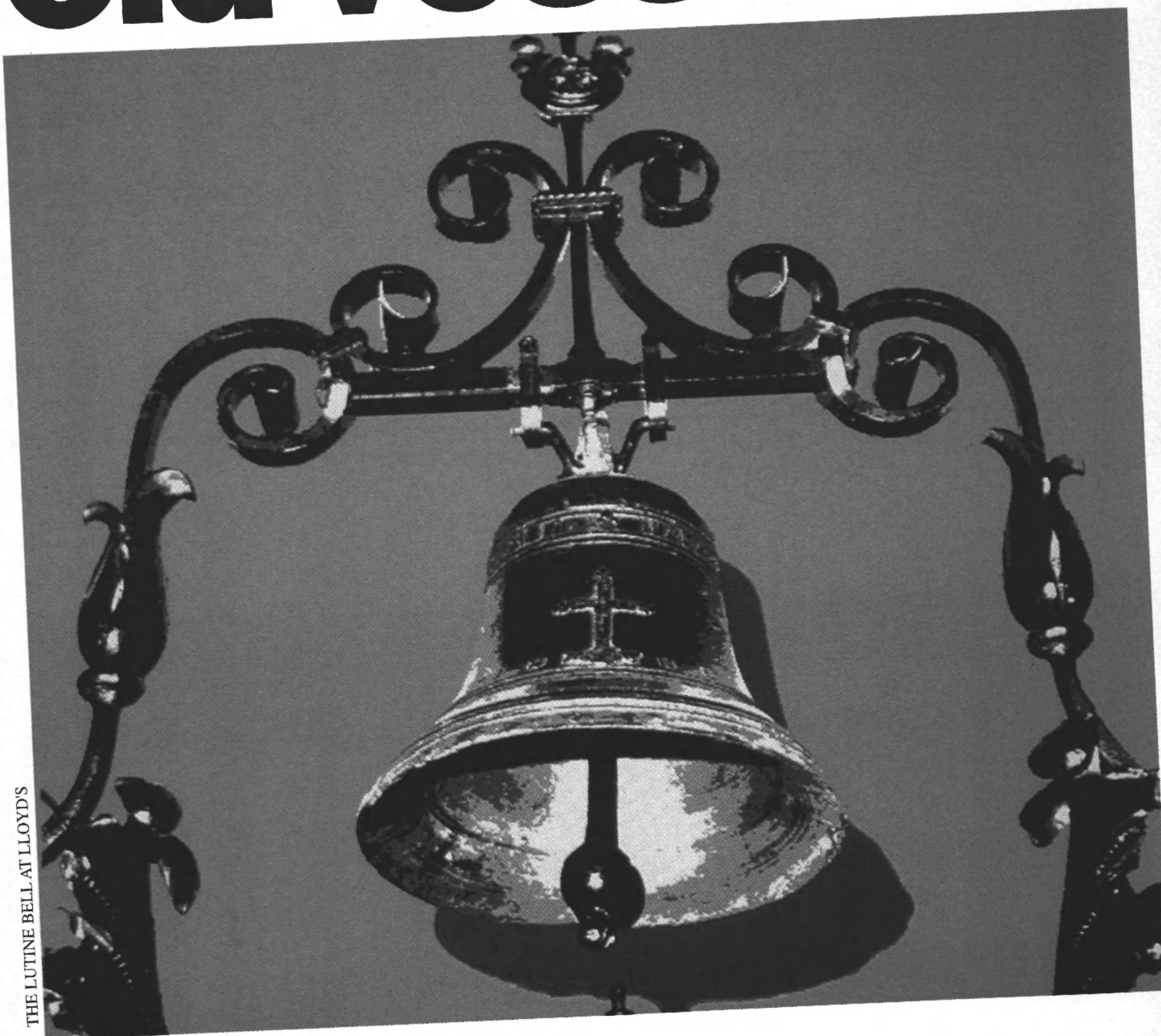
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OFFSHORE RIGS SURVEY



OFFSHORE MOBILE DRILLING UNITS
UNDER CONSTRUCTION OR ORDERED

	Jackups	Barges	Semisubmersibles	Ships	TOTAL
By Area Of World (Location of Shipyard)					
U.S. Gulf of Mexico	0	2	0	0	2
Middle East	1	0	0	0	1
U.S.S.R.	2	0	3	1	6
TOTAL	3	2	3	1	9
By Delivery Date					
1993	3	2	2	1	8
1994	0	0	0	0	0
1995	0	0	1	0	1
1996	0	0	0	0	0
Undetermined	0	0	0	0	0
TOTAL	3	2	3	1	9
With No Drilling Contract					
1993	0	0	1	0	1
1994	0	0	0	0	0
1995	0	0	0	0	0
1996	0	0	0	0	0
TOTAL	0	0	1	0	1

Source: Offshore Rig Locator

Source: The Offshore Rig Locator, published by Offshore Data Services, Inc., P.O. Box 19909, Houston, Texas 77224; telephone (713) 781-2713; and telefax (713) 781-9594.














MOBILE RIGS UNDER CONSTRUCTION


Rig Owner	Rig Name	Design	Water Depth	Shipyard	Estimated Cost (\$MM)	Delivery Date	Contract
BARGES							
ENSCO	Ensko 09	Maracaibo type, over the bow drilling.	125'	Texas Drydock — Orange, TX, USA	\$16.0e	4/93	Lagoven — 5 years — Previously 'Ensko B'.
ENSCO	Ensko 10	Maracaibo type, over the bow drilling.	125'	Bender Shipbuilding — Mobile, AL, USA	\$16.0e	5/93	Lagoven — 5 years — Previously 'Ensko D'.
JACKUPS							
NATIONAL IRANIAN DRIG	Iranian Unnamed Jackup 01	Rauma-Repola, 3 triangular legs, cantilever.	300'	Iran Marine Industrial — Neka, Iran	\$70.0	4/93	NIOC — Owner operated.
RUSSIA	Russia Unnamed Jackup N402	CD&EB — Coral Design, Arctic Class, 3 legs, cantilever.	300'	Vyborg Shipyard — Russia	\$67.0	6/93	Sahalinmor — Owner operated.
UKRAINE	Tavride N610	CD&EB — Coral Design, 3 legs, cantilever.	250'	Nikolaav Shipyard — Nikolaav, Ukraine	\$60.0e	4/93	Chernmor — Owner operated.
SEMISUBMERSIBLES							
AZERBAIJAN	Shelf 07	CD&EB — Coral Design, 6 columns.	1,000'	Astrakhan Shipyard — Astrakhan, Russia	\$80.0e	4/93	Caspmor — Owner operated.
AZERBAIJAN	Shelf 09	CD&EB — Coral Design, 6 columns.	820'	Astrakhan Shipyard — Astrakhan, Russia	\$80.0e	1/95	Caspmor — Owner operated.
JAN - ERIK DYVI & KVAERNER	Iliad	CD&EB — Coral Design, 6 columns.	650'	— Vyborg, Russia	\$80.0e	11/93	Available — Previously 'Shelf 12' owned by Russia.
SHIPS							
UKRAINE/RUSSIA	Unnamed Ship 01	Soviet Design, dynamic positioning.	1,000'	Kherson — Ukraine	\$60.0e	4/93	Arcticmor — owner operated. Construction previously halted; now nearing completion.

Source: Offshore Rig Locator

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Liner Service Expected to Boost Houston's Container Volume

The Port of Houston's container volume is predicted to increase at least 20% with the addition of a new weekly liner service. Under a joint agreement that will link North Europe, the U.S. Gulf Coast and Mexico, Transportacion Maritima Mexicana (TMM), Tecomar, Atlan-

tic Container and Hapag-Lloyd will call at the Barbours Cut Terminal.

Hapag-Lloyd will supply two vessels to kick off the service, and TMM will provide four ships.

The Barbours Cut terminal was down from 433,191 20-foot equivalent units (TEUs) in 1991 to 391,788 in 1992. Containerized cargo was down from 3.96 million in 1991 to 3.61 million in 1992. Barbours Cut has more than 350,000 trucks moving through it yearly and 600 to 700 ship calls annually.

Mentor Engineering Appoints New Board Members

The board of Mentor Engineering Consultants Limited, a subsidiary of McDermott International, Inc., has announced the following appointments to the Board.

James J. Wildasin is elected chairman. Mr. Wildasin is president and chief operating officer of McDermott Marine Construction and is responsible for worldwide

construction operations, including the company's HeereMac and McDermott-ETPM joint ventures.

E. Allen Womack is appointed to the board. Mr. Womack is service president and chief technical officer of McDermott, responsible for maintaining the company's strategic technical leadership in all areas of operation.

Continuing as members of the board are David L. Pridden, managing director; **Anthony R. Cousir**, technical director; and **James Law**, who is also managing director of McDermott Engineering (Europe) Limited.

Mentor Engineering Consultants Limited is a design and management consultancy for subsea technology headquartered near London. McDermott International, Inc. is a leading worldwide energy services company. The company and its subsidiaries manufacture steam-generating equipment, environmental equipment, and government and aerospace products. They also provide engineering and construction services for industrial and utility facilities onshore, and offshore to the oil and gas industry.



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Oceaneering International Chosen By DOE For Two Projects

Oceaneering International, Inc., has been notified by the U.S. Department of Energy (DOE) that it has been selected to perform two research and development projects in the area of environmental restoration and waste management in support of DOE efforts to clean up the Nation's nuclear weapons complex.

Oceaneering Space Systems (OSS) has been selected to develop and demonstrate an advanced worker protection system, and Oceaneering Technologies, Inc., (OTECH) has been selected to research, develop, and demonstrate a full-scale tethered robotic vehicle system to clean radioactive surfaces.

The Oceaneering group of companies supplies a comprehensive range of integrated technical services to a wide array of customers requiring intervention underwater or in harsh environments. Principal services are directed to the offshore oil and gas industry and include drilling support, subsea construction, production systems, facilities maintenance and repair, survey and positioning, engineering and specialized inspection, both offshore and onshore.

Oceaneering Technologies, Inc. specializes in advanced engineering, development, and deepwater search and recovery for a broad base of international customers in the telecommunications, insurance, salvage, theme park and other non-oilfield industries, in addition to governmental groups, both foreign and domestic. Services range from high-level conceptual design and computer analysis to construction

Maritime Reporter/Engineering News

l operation of sophisticated deeping remotely operated vehicles (RVs) and towed systems, speciald underwater tooling, and landesed robotic hardware. Deepwater rations include search, recovery, derwater inspection, and seafloor upping to depths of 25,000 feet, as llas the maintenance, repair, and rial of undersea telecommunica-ms cables. For more information on eaneering International Inc.,

Circle 34 on Reader Service Card

like Metal Products delivers Transport Barge



Hike Metal Products' Aluminum Transport Barge

A 30-foot all welded aluminum transport barge was recently delivered to the National Park Service for Bighorn Canyon National Recreation Area by Hike Metal Products Ltd., Wheatley, Ontario, Canada.

The barge is custom built to provide multi-purpose transportation usage. Twin Mercruiser diesels D-219 with Bravo II outdrives push the boat at 30 m.p.h. with a 6,200 lb. load.

Specialized outfitting includes: forward cargo deck with inset hardwood tracks; full width double hinged bow loading ramps for loading & unloading vehicles and equipment at various terrain levels; forward push knees; side hinged dive platform; 500 lb. davit with sockets both sides; large capacity deck cargo winch; heavy duty rubber fender around deck edge; large wheelhouse with sliding door access aft; side bench seat/lockers for six crew; center helm position with Bostrom suspension seat; full controls and instruments.

Derbyshire Appointed East Coast Marine Distributor Of Foam Vests

Derbyshire Foam Systems Products has been appointed the American east coast distributor for the Maverick Foam Vest System by IMSSCO of San Diego, Calif.

This revolutionary system's centerpiece is a reusable foam-filled vest which proportions foam concentrates at the nozzle at the will of the firefighter. One person can immedi-

ately control foam or water spray with the flick of a lever.

The system eliminates restrictions of hose length, elevation and eductor pressure loss while maximizing mobility and efficiency.

The Maverick Foam Vest is also ideal for vapor suppression of hazardous materials.

By using Maverick Haz-Mat foam, the vest provides immediate vapor suppressing foam for hydrocarbons, polar solvents and certain chemi-

cals using fresh or salt water.

The Maverick Dispersant Vest is now in use for dispensing oil spill dispersants along with bio-remediation.

Derbyshire offers a four-page color brochure and video tape explaining the Maverick Foam Vest System.

For additional information on the Maverick Systems,

Circle 28 on Reader Service Card

Carrier Develops Container Airflow Transition Piece

A design breakthrough of the airflow transition piece by Carrier Transicold will reportedly save the refrigerated container industry \$100 per year, per unit, and also improve the unit's airflow capacity. For more information from Carrier,

Circle 89 on Reader Service Card

How A Band Of Zulu Warriors Fended Off Hurricane Hugo.

Hurricane Hugo brought 12 foot seas and 85 knot winds to Charleston, South Carolina, destroying ships, small boats and docks. At the U.S. Naval Base, Charleston, the ships moored at piers survived the storm, but their fender systems, made of timber or steel piles, suffered extensive damage, with replacement costs in the millions.

The exception was at Pier Zulu, where resilient foam-filled fender systems made by Seaward protected the ships as well as the

piers. Seaward's fenders at Pier Zulu not only performed admirably, but were fully functional even after the devastating hurricane.

Which is just what people expect from the world's largest manufacturer of foam-filled and elastomeric marine fenders and flotation products. Seaward's outstanding product lines have a 20-year history of performing well between a dock and a hard place.



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Intercon Offers Engineering And Manufacturing Services

Intercontinental Engineering-Manufacturing Corporation (Intercon) of Kansas City, Kan., offers diversified engineering and heavy manufacturing services for marine, military and industrial markets.

For more than 35 years, heavy duty cranes and deck machinery have been sold under the Intercon name to governments and commercial customers worldwide.

Intercon's manufacturing facilities provide heavy fabrication and machining of weldments and components weighing up to 150 tons. In-house CAD/CAM, stress relieving, assembly, testing and private barge facilities further support its turn-key capability.

Recent deliveries of twin cranes for seven Auxiliary Craneships (T-ACS) and weapons handling portal cranes for NAVFAC attest to Intercon's range of products and experience.

Current military projects include fabrication and machining of propulsion gear casings for the Arleigh Burke Class Destroyer (DDG-51). Deck machinery for naval applications include the assembly of vertical windlasses for new aircraft carriers (CVN) and customized deep ocean salvage systems (FADOSS). The FADOSS System incorporates advanced traction winch design, power supplies, and related line handling and storage hoists. This system is typical of Intercon's involvement in unique, special application deck machinery and material handling equipment. All manufacturing and quality control activities conform to MIL-1-45208A and related military standards.

Intercon's line of commercial deck machinery includes towing and anchor handling winches, windlasses, capstans, barge and rig mooring systems, and hose reel assemblies for pipelay and underwater construction.

For the tug/barge industry, Intercon offers its exclusive Mechanical Coupler System. This patented system provides a rigid connection for pushing, yet allows free pitch motion. Current production involves three complete coupler shipsets including 92-ton reinforced skeg modules which retrofit to barges. Installation work is underway on M/V Seafarer and the 260,000 barrel barge Ocean 255 owned and operated by Maritrans of Philadelphia, Pa. Two additional shipsets for Maritrans are expected for delivery in the second quarter of 1993. The Intercon Coupler System provides unmatched safety, speed, and versatility advantages for articulated tug/barge operators.

For more information on cranes and deck equipment from Intercon,

Circle 30 on Reader Service Card

Second \$7.9 Million Crane In Place At Southport

Port Everglades' 155-acre Southport Container Complex now has two \$7.9 million container gantry cranes in place and will soon be ready for Lift-on/Lift-off (Lo/Lo) operations.

Built by Samsung Companies Inc.,

the 1,300-ton cranes arrived fully assembled aboard vessels Dock Express France and Dock Express II and were off loaded onto the Southport crane rails shortly after arrival. Port Everglades received the first Southport gantry crane in February 1993, the second in March 1993 and anticipates a third arrival in May 1993. Lo/Lo operations are expected to be available late spring.

As one of the most important operational aspects of the seaport's

new 155-acre Southport Container Complex, the heavy lift cranes can move 35-45 containers an hour, and can easily handle Post-Panam vessels.

Each will utilize specially designed telescopic Bromma spreaders and provide a safe working load of 40 long tons with the spreader; 6 long tons under the hook. All three 151-foot tall cranes are designed to be low-profile to not interfere with adjacent airport operations.

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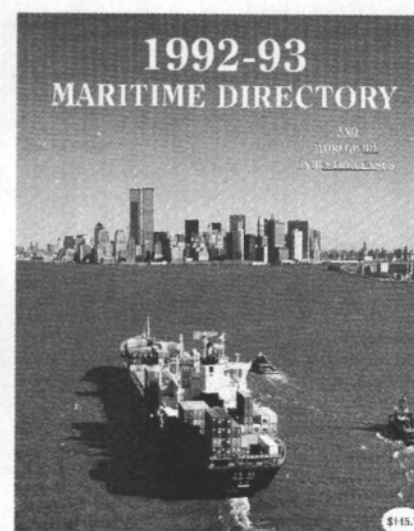
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Sonsub Expands Its Technological Capabilities

As part of its worldwide expansion, Sonsub has announced the formation of Subsea Production Systems (SPS), a new division which will specialize in the engineering, design, manufacture, testing and installation of subsea production systems. The principals of SPS, **Dana Beebe, William Parks and Gary Weathers**, all recently joined Sonsub to head up this new division. They bring with them extensive international experience in the development of advanced technology for major offshore and subsea applications.

Headquartered in Houston, Sonsub's Subsea Production Systems will take a systems approach to subsea development, providing project management, engineering design, system integration, testing, hardware, installation and remotely operated technology support on a worldwide basis.

The formation of Subsea Production Systems reflects Sonsub's commitment to maintaining a proactive position within the underwater industry by constantly modifying and adapting its services to meet changing demand and market conditions.

Sonsub specializes in applications where it is desirable to keep people removed from hazardous environments. The company provides remote technology for a wide range of activities associated with oil and gas exploration, search and recovery, defense, civil and industrial projects. Sonsub maintains offices in the U.S., the U.K., Norway, Australia and Southeast Asia.

For more information on Sonsub,

Circle 37 on Reader Service Card

Tom Mullins To Manage Blue Star Line In Eastern Canada



Tom Mullins, Assistant Vice President, Eastern Canada Blue Star Lines

Thomas Mullins has been named assistant vice president, Eastern Canada, for Blue Star Line (BSL). From his office in Montreal, Mr. **Mullins** manages all aspects of Blue Star's Eastern Canada trade, including sales and marketing, pricing, conference activities, operations and equipment control.

Blue Star Line provides both northbound and southbound shipping service between North America and Australia, New Zealand and several South Pacific Islands. Eastern Canadian cargoes move intermodally through Blue Star's

Philadelphia hub.

Mr. **Mullins'** appointment and his move to Montreal marks increased emphasis on the importance of Blue Star's Eastern Canadian markets. BSL has structured the region as a separate, autonomous "zone," with its own cost and market-development responsibilities.

"Eastern Canada is an area of great value and opportunity for Blue Star Line," said **Ray Tilley**, president of BSL.

Caterpillar's Engine Donation Benefits Maritime Service Academy Training

Caterpillar Inc. of Peoria, Ill. has donated a diesel engine to the U.S. Merchant Marine Academy (USMMA) that will enhance the federal maritime school's marine engineering program. The D379 diesel engine will be used as a training aid by undergraduate midshipmen as

well as by licensed seafarers who enroll in various continuing education courses at the Academy in Kin Point, N.Y. The Caterpillar D3 diesel is part of a series of engines used globally to power tugboats, fishing trawlers and other moderately sized vessels. It is also used as shipboard generator on larger ships to power a variety of auxiliary needs. Due to its popularity, there are more than 40,000 of this family of engines at work today.

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Maritime Reporter/Engineering News



The main deck casino on the Players Riverboat Casino, as designed by Directions In Design of St. Louis.

Gaming Boom Continues

Recent Developments: Service Marine Delivers Northern Star, First Major Casino-Owned Boat; ITT Sheraton Enters Gaming Vessel Arena

Optimism surrounding the gaming vessel market seemingly reaches new heights monthly, with news of legislation passed, contracts for vessels signed and new branch offices of ancillary suppliers opened.

Missouri Legislation Paves Way For Newbuilding

In a much anticipated move, the Missouri legislature passed a bill which authorized the formation of a state gaming commission, which in effect may pave the way for riverboat gaming to begin as early as the end of 1993.

The Missouri Senate and House approved a committee bill which would establish a five-member gaming commission, which would be charged with the duty to license gambling boat applicants.

As worded by the legislature, the law would allow for five boat slips, potentially allowing for continuous

docking, but a decision, both in number and terms, left up to the commission.

In Louisiana, the Louisiana Riverboat Gaming Commission has started to dole out the 15 available licenses to more than 35 hopeful applicants.

One of the higher-profile projects, a \$55 million project between the Hilton Hotels Corp. and New Orleans Paddlewheels Inc., was given the green light as it received its Certificate of Preliminary Approval, as reported in the May 1993 issue of Maritime Reporter.

The partnership will build the 2,400-passenger Queen of New Orleans riverboat casino, a 404-foot by 90-foot vessel, at Trinity Marine Group's Equitable Yard. Modeled after elaborate paddlewheel boats of the 1890's, the Queen of New Orleans is slated to open in the summer of 1994.

Finally, the Mississippi Gaming Commission recently granted final site plan approval for dockside ca-

sino development to Harrah's, the casino entertainment division of The Promus Companies.

The \$49 million project is to be located in Tunica County, Miss., approximately 20 miles south of Memphis.

Harrah's will be a 75 percent general partner in the project with Belz Enterprise of Memphis holding the other 25 percent. The proposed facility will feature 32,100-sq.-ft. of casino entertainment space with 1,460 slot machines and 54 gaming tables.

A Builder's Delight

Among the recent launching and newbuilding announcements was the launch of Harrah's Northern Star by Morgan City, La.-based Service Marine.

The 210-by-67-foot Northern Star has a certificate for 1,200 passengers plus crew and 800 gaming positions.

This is the first riverboat casino

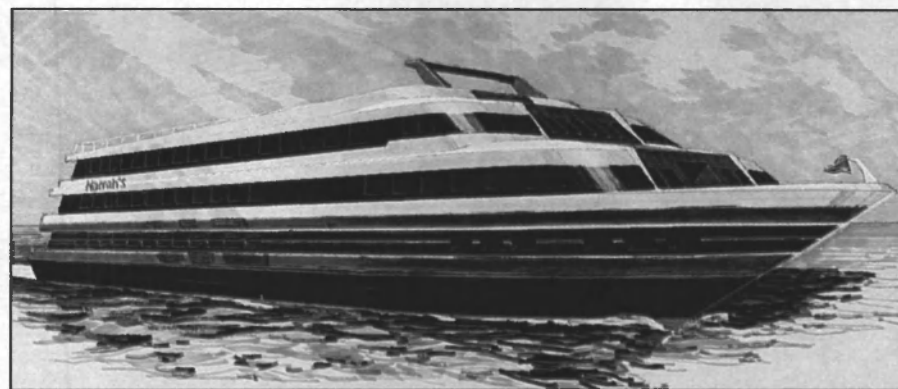
in the U.S. to be owned and operated by one of the nation's major casino entertainment companies.

The interior of the Northern Star, which will operate in Joliet, Ill., was designed by Morris and Brown of Las Vegas, and the vessel features an atrium, with a glass cab elevator, through the second and third decks. The boat has 460 tons of air conditioning provided by Carrier chillers and air handlers, and Service Marine has installed a smoke extraction system which changes the air in the boat every eight minutes to minimize the effects of smoking.

The Northern Star, which is the first of two gaming boats built by Service Marine for Harrah's, is powered by two 960-hp Caterpillar diesel engines through a flexible mounting system furnished by Lo-Rez.

In another deal Harrah's and partner Et River Corp. were awarded a Certificate of Preliminary Approval for a \$41.3 million gaming development in Shreveport, La., and construction of a 210-foot turn-of-the-

THREE ACES from Service Marine



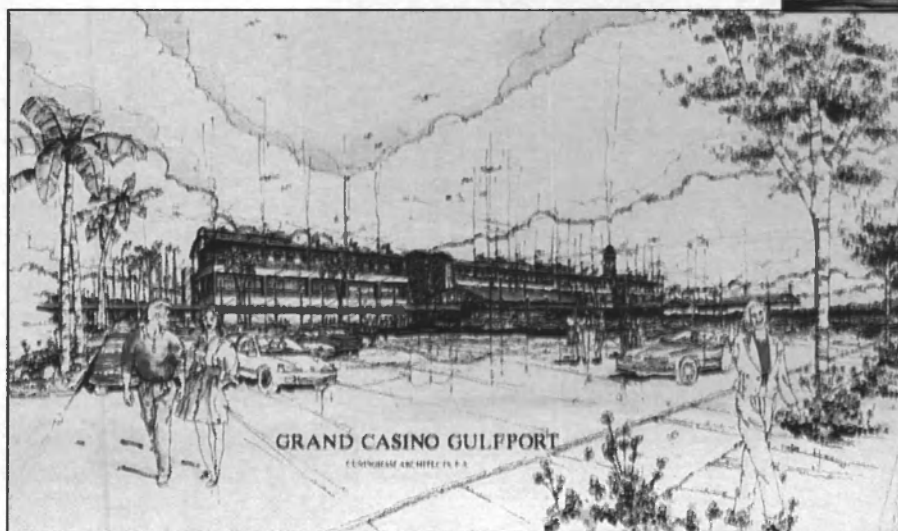
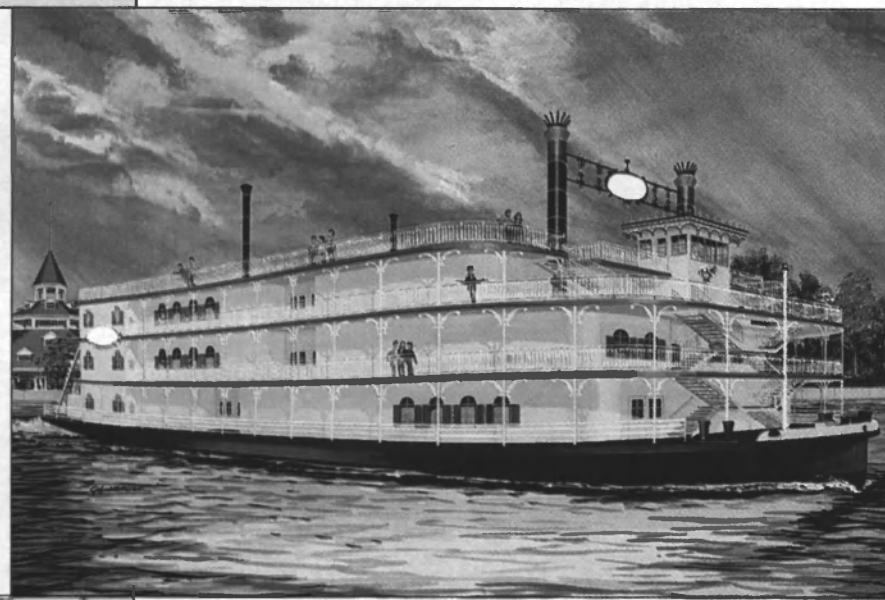
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ry style paddlewheel riverboat scheduled to start at the end of 1993. The new three-level cruise liner, called Alton Belle, accommodates 1,200 passengers compared to the 490 on the current Belle. The vessel measures 220 feet by 30 feet and features an interior design similar to a Las Vegas casino. Finally, the Joliet-based Empress riverboat divulged plans to build its current facility via a \$40 million project which includes the construction of a second vessel. The second boat, the Empress II, is a 300-foot vessel expected to be completed this fall.

This expansion news is on the heels of figures which indicate Illinois' earnings on riverboat casinos expected to be \$116 million higher than expected, with much of the earnings coming from the Joliet Empress, which at press time was making more than four times the amount anticipated.



Harrah's Northern Star was recently delivered by Service Marine.

Spreading The Wealth

While owner/operators and vessel builders are more often than not the names splashed across the headlines and immediately associated with the multi-million dollar contracts, service and product suppliers to the gaming vessel market have been grabbing their fair share of business and attention as well.

If expansion is a signal of success, both Universal Distributing and Bally Gaming have given the burgeoning gaming vessel market a

"thumbs up" with recent openings. In mid-February, Universal opened its sales and service office in St. Louis, and Bally opened a Biloxi, Miss. service office February 1.

Directions In Design, Inc. (DID), a St. Louis interior design firm specializing in marine hospitality and founded in 1975, has several current projects which involve substantial square footage devoted to gaming. The firm recently completed work on Players Riverboat Casino. DID's staff of 32 includes design professionals and support staff to

produce any size project in a timely, cost-effective manner. Currently the firm is working on 12 marine projects which are in various stages of design.

The Bud Jones Company is a full-service casino supply company, which has been family-owned and operated since 1965. Based in Las Vegas, the company occupies a large modern building which houses manufacturing, warehousing and administrative offices.

The Bud Jones Company features an in-house graphic arts department which enables quick approval of top designs, and the company is licensed to service casinos in Nevada, New Jersey, Iowa, Illinois, Mississippi, Connecticut and Washington State, with applications currently being processed for other gaming jurisdictions.

In 1973 the company introduced to the casino market a new concept in casino chips to satisfy a demand for a chip more counterfeit resistant than other conventional chips. In addition to being a major producer of dice and chips, the Bud Jones Co. is also a leader in customized casino tables and related accessories.

Sanko Orders Bulk Carriers From Nomura

Sanko Steamship, Japan, has placed an order with Nomura Shipbuilding for 10 handymax bulk carriers in a deal reportedly worth approximately \$250 million. Nomura is to deliver the series in the second half of 1994 and early 1995.

The new tonnage will enable Sanko to replace handysize tonnage that figured in its near-ruinous investment program of the early 1980s. It will also allow the firm to aug-

ment handysize capacity depleted through sales and return of chartered and leased vessels.

"Juan J. Sister" Delivered From Kvaerner Masa-Yards

The Ro/Ro-passenger ferry Juan J. Sister was delivered from Kvaerner Masa-Yards' Turku New Shipyard to the Spanish government-owned Compania Transmediterranea S.A. The vessel is the first Spanish ship built in Finland. The



Juan J. Sister Ro/Ro-passenger ferry.

22.4-gt Juan J. Sister is specifically designed for traffic between the Canary Islands and the mainland of Spain. The vessel can carry a total of 150 cars and 92 trailers. There is accommodation for 400 passengers in 139 cabins. The vessel has four cargo decks, twin stern ramps and one bow ramp. The vessel is pow-

ered by four Wartsila Vasa 32 diesel engines. Juan J. Sister is 495 feet long, with a breadth of 85 feet and a draught of 19 feet. Its top speed is 18 knots. The vessel complies with the latest SOLAS safety standards with double hull in required areas. Excellent maneuverability is achieved with two flap rudders and two bow thrusters. In addition, the vessel is equipped with fin stabilizers for passenger and cargo comfort in rough sea conditions.

MTU Australia Opens Plant Extension



Opening ceremony for MTU Australia's plant extension: Minister for Industry, Senator John Button (3rd from right) and Hans J. Walloschek, president of MTU Australia (right)

In 1992, MTU Australia received orders for a total of 20 Series 396 engines from western Australia's leading shipyards. MTU Australia is a subsidiary of MTU Friedrichshafen. Two 131-foot catamarans are currently under construction at Austal Ships. They are to carry 368 passengers each in the Hong Kong region. Together with these two new buildings, Austal has manufactured 11 boats with MTU propulsion for the Yuet Hing ferry company, which operates a fleet of ferries in China and Hong Kong.

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American Eagle Responds To 'Galveston' Collision

After colliding with the 593-foot Panamanian freighter Atticos at 3:30 a.m., approximately 1.5 miles south of Venice, La., the 180-foot crewboat Galveston immediately sank in 85 feet of water. Later that morning, the salvage experts at American Eagle Marine, Inc., of

Harvey, La., were called in for assistance and were on location by 11 a.m.

Contracted by underwriter's representative Technical Maritime Associates, American Eagle's independent divers faced eight-plus knot river currents and zero visibility as they entered the sunken vessel in search of three missing crewmen. By midnight of the same day, two of the three bodies had been recovered.

"Our quick response to this catastrophe could not have been possible without the assistance of the Coast Guard in redirecting river traffic, and the Corps of Engineers in relocating the wreck after the Galveston had slipped completely below the river's surface," said **Doug Adams**, operations manager for American Eagle.

Initially working from a 50-foot trawler to set the warning buoys and perform the initial diving,

American Eagle later transferred operations to its 180-foot, 100 lifting capacity derrick barge "Gory L."

According to Mr. Adams, the offloading of the Galveston prior to her salvage was made more difficult by her cargo of explosives and petroleum, used for downhole oil field work.

Coast Guard Uses Workboats Northwest Skiff To Tend Navigation Aids

The U.S. Coast Guard has taken delivery of four rugged 19-foot skiffs from Workboats Northwest, Inc., Seattle. The vessels will service aids to navigation in Pacific Northwest ports and rivers.

President **Bruce Reagan**, Workboats Northwest, Inc., reports that the Coast Guard "is extremely happy with their performance." The skiffs, which are 19 feet overall with a beam of eight feet, were supplied for their load ability, ruggedness and stability as a work platform.

Different options were supplied with each skiff depending upon the needs of individual Coast Guard stations. Among options provided were tow bits, tie-off rails and special cleats. All skiffs were built with heavy duty fendering, internal fuel cells and positive flotation. Workboats Northwest constructed the skiffs to ABS standards, stressing toughness and long life.

The Coast Guard uses the skiff to service and inspect buoys, day markers and both solar and battery powered lights along waterways. The skiffs tend aids to navigation in Astoria, Coos Bay and Portland harbors, and on the Willamette, Columbia and Snake Rivers. The skiffs are transported either by trailer or on the USCG Cutter Bluebell.

Freeman Marine Offers New Quick-Acting Door

Chain driven quick-acting doors from Freeman Marine, of Gold Beach, Ore., are the latest innovation from the firm specializing in high quality marine closures. The new door offers large windows, lightweight and diverse sizes.

The chain-driven mechanism can be located in the panel or bulkhead and provides design flexibility normally not found in quick-acting marine closures. The self lubricating, all stainless steel mechanism is easy to maintain, uses standardized components, can be manually or mechanically activated and a multiplicity of dogs can easily be accommodated. The door's sealing pressure is adjustable and it can be painted without disassembly of the mechanism. The activation handle can also be positioned in a variety of locations. Some special applications where fast-action, visibility doors are useful aboard ship include: engine rooms, crews quarters, storage areas, pilot house, etc.

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EMPRESS - 222' x 66' ultra modern gaming vessel was built for Des Plaines River Entertainment Corporation, Joliet, Illinois. Two ballroom-size casinos on the upper and lower decks provide comfort and enjoyment for the 1200 passengers cruising the Des Plaines River on gaming excursions.



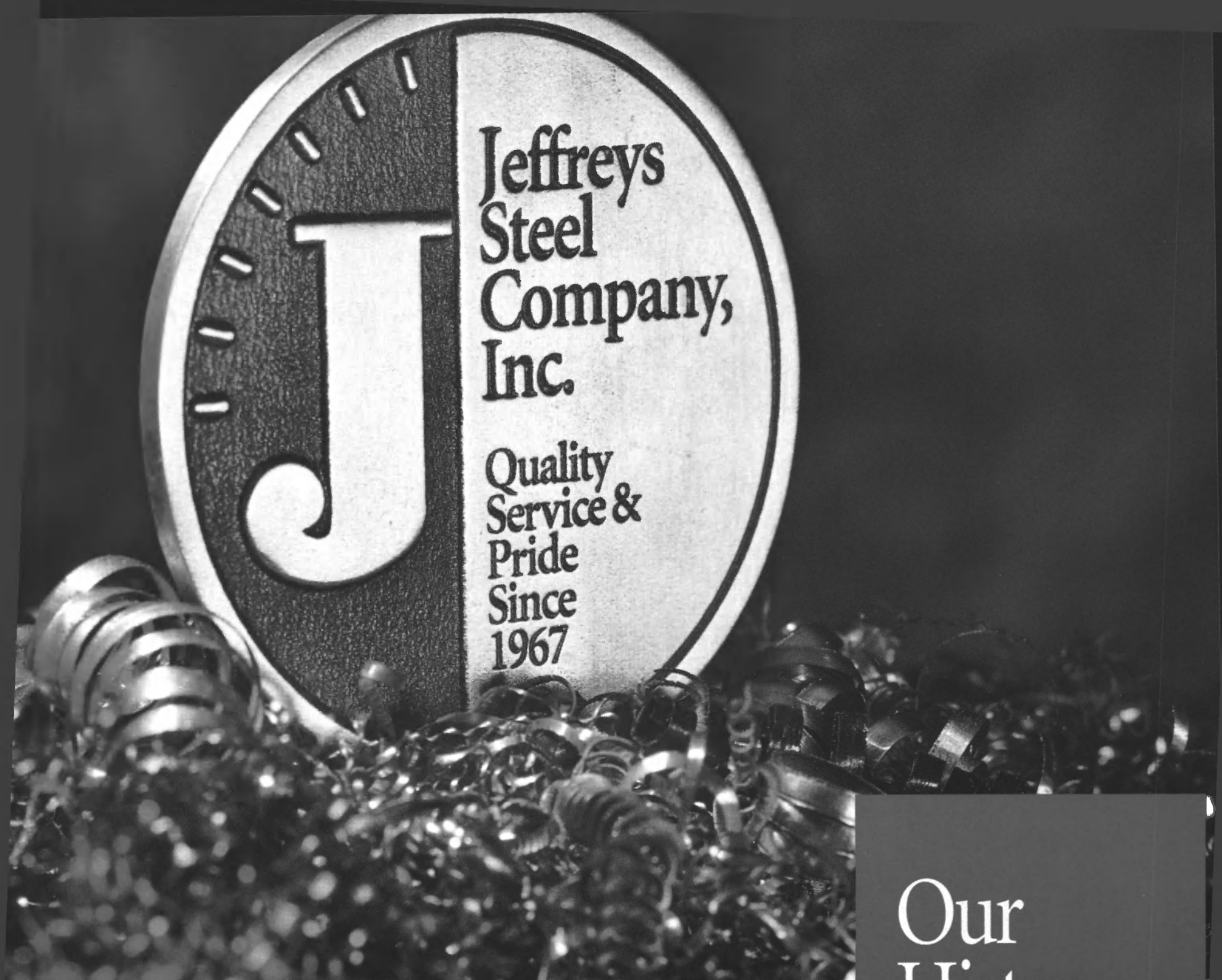
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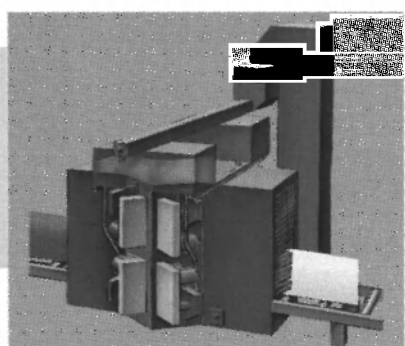
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**George G. Sharp, Inc.
Appoints Gluse As Director,
Fleet Support Operations**



Michael R. Gluse

George G. Sharp, Inc. of New York announced the appointment of Michael R. Gluse as director, fleet support operations, located in Sharp's Norfolk, Va. office. In this position, Mr. Gluse will provide focus and direction to those Sharp contracts which provide direct fleet support in areas such as planning, analysis, training, logistics, modernization, repair and maintenance. He is an active member of the Tidewater Chapter of the American Society of Naval Engineers, the Society of Naval Architects and Marine Engineers, the Portsmouth Rotary Club and has served on several civic service programs.

**Norwegian Shelf Oil
and Gas Expectations
Rise 12 Percent**

According to new estimates from the Norwegian Petroleum Directorate, resources on the Norwegian shelf have increased 12 percent and Norway will remain one of the largest oil producers in the world for at least another 45 years.

New calculations show that the Norwegian sector of the Continental Shelf contains extractable resources corresponding to about 10 billion tons of oil equivalents (toe).

In 1992, the total petroleum production of the Norwegian Shelf was about 132.9 million toe. Of this, the oil production was approximately 103.9 million toe, the sale of gas 25.8 million toe, and the production of LNG three million toe.

These numbers signify a large production increase over the previous year, when total production was 118.8 million toe.

**Additional Repair Work
Coming To H-DIL**

As work on the vessel Marinor has been completed at Halifax-Dartmouth Industries Limited's (H-DIL) Halifax Shipyard, the company is now looking forward to doing repair work on two more vessels.

The Marinor was docked for repairs to its rudder which was damaged by ice.

The Marine Atlantic ferry M.V. Caribou arrived at the Halifax Shipyard and was docked for rudder repairs.

Last month, the Imperial Oil tanker, Imperial Acadia, was docked for a refit.

Earlier, the Canadian Coast Guard vessel, John Cabot, was docked for a 30-day refitting and

repair work.

For more information on H-DIL,

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**MSC Charters The Largest
U.S.-Flag Tanker**

The U.S. Navy's Military Sealift Command chartered the U.S.T. Pacific, the largest tanker in the U.S.-

flag merchant fleet, to carry 2.5 million barrels of oil from the U.K. and Norway to the U.S. Gulf Coast.

The operation took more than four weeks and \$7.3 million to complete.

The Pacific is almost 1,188 feet long, the largest ship in the Navy's fleet. It has a 228-foot beam and a 75 foot draft. MSC operates these ships in three separate forces: the Naval Fleet Auxiliary Force; the Special Mission Support Force; and the Strategic Sealift Force.

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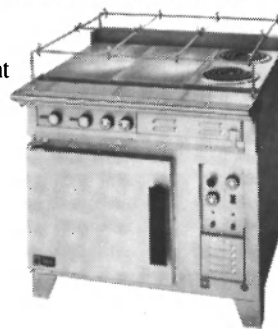
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Newport News Apprentice School Set To Celebrate Its 75th Anniversary

Just inside the 37th Street gate at Newport News Shipbuilding (NNS) in Virginia is a three-story, red brick building housing the yard's Apprentice School, which was established in 1919.

The school, set to celebrate its 75th anniversary next year, opened with 126 students and since then has never had less, and during World War II the student body ballooned to more than 1,000.

Today, when the first shift whistle blows at 7 a.m., 600 young men and women equipped with hard hats, steel toed shoes and books file into the brick building or go to a production job on the waterfront to study and work in 21 different trades.

As President Clinton looks for ways to successfully launch a federally-sponsored apprentice program, one NNS Apprentice School gradu-

ate, **Glen A. Davenport** (Class of 1968), who is now president of his own insurance company, thinks Washington should turn to NNS for ideas. "I remember reading how **Bill Clinton** commissioned a task force that did a study on why European industry was more productive," said Mr. **Davenport**.

"The task force reported that Europe's great competitive advantage was the apprentice system found in just about every industry. I remember thinking that he didn't need to send a task force to Europe to find this out; he just needed to look at Newport News Shipbuilding."

Just eight years after Newport News Shipbuilding was founded in 1886, it certified its first apprentice, **Norwood Jones**.

In 1911 the company initiated a system whereby apprentices and other company employees could at-



The Newport News Shipbuilding Apprentice School, which opened in 1919.

tend night classes at Newport News public schools.

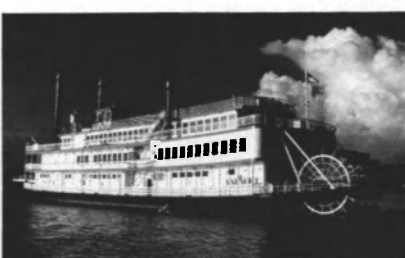
NNS is the largest and one of the most modern shipyards in the western hemisphere, and it currently builds some of the most complex

ships afloat, vessels which include nuclear-powered aircraft carriers and submarines, with state-of-the-art computer technology and production methods.

Over its history it has built hu-



Levee-built Belle of St. Louis



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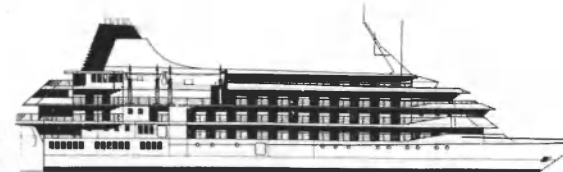
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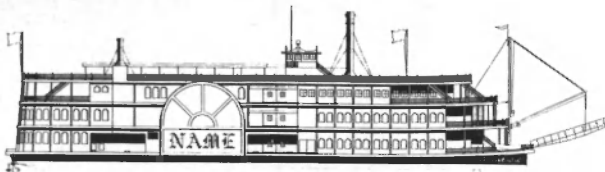
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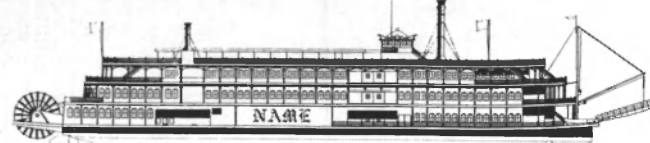
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Maritime Reporter/Engineering News

ds of navy and commercial ships, including the SS United States and Nimitz-class aircraft carriers. As technology of ships and shipbuilding has become more complex, the Apprentice School has kept pace with what it teaches and how it teaches in order to provide skilled people.

W.R. (Pat) Phillips, president and CEO of NNS and himself an apprentice School graduate (Class 1954), has said that "the Apprentice School has been the vehicle for achieving our core production technology to a continuous flow of young people through most of our company's history."

The three major components of the school's educational program are academic instruction, craft training and extracurricular activities.

A typical week for an apprentice consists of a combination of classroom instruction, craft training, production experience, and, perhaps, participating on an intercollegiate athletic team.

The academic curriculum includes a core of five semesters of course work common to all trades. All apprentices must complete courses in mathematics, drafting, marine engineering, shipbuilding operations and technical communications.

There is also an optional advanced curriculum for those who excel in the required course work.

By the end of their four-year apprenticeship, students can perform even the most complex jobs in their trades.

"Everything our apprentices do is related to their current or future work," said Mr. Phillips. "What they learn and accomplish gives them the opportunity to succeed, grow and become leaders at NNS or elsewhere."

More than 2,500 Apprentice School graduates work at the shipyard. However, not all graduates remain with the company.

But those who left still count their Apprentice School experience as important to their success, and the graduate roll consists of a long list of doctors, attorneys, professors, managers and business executives and owners.

James H. Wilson, Class of 1964, said "The Apprentice School gave me great training. It not only made me a competent shipfitter, but instilled in me the culture of the company, its work ethic and pride in what I am doing."

NNS does encourage Apprentice School graduates to continue their education beyond graduation.

They are helped by transfer-of-credit agreements between the school and two four-year colleges in the area.

Graduates of the school receive certificates of apprenticeship from the company and the Virginia Apprenticeship Council.

To ensure the sustaining quality of the program, it is benchmarked against other members of the American Apprenticeship Round Table, an association of more than 30 leading programs that NNS helped to

found in 1943.

"Many high schools emphasize college or nothing. Vocational or trade education is looked upon as an unworthy second choice...We try to correct that misconception," said Mr. Phillips.

"Let me tell you, there is no more valuable asset to this country than a skilled and educated person who can build the complex products that are at the heart of our country's

industrial future.

These are the people who will ultimately make or break our ability to compete in a global market. I think President Clinton is on the right track. At Newport News Shipbuilding we discovered apprenticeships 100 years ago.

We have nurtured that discovery and made it stronger. It could be the way of the future for millions of young men and women in America."

Crowley American Transport Receives \$13.6 Million Navy Charter Contract

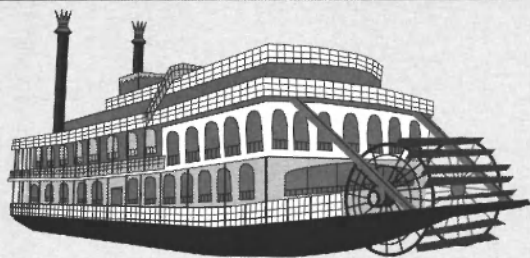
The U.S. Navy's Military Sealift Command (MSC) has awarded a \$13.6 million contract to Crowley American Transport, Inc., of Jacksonville, Fla., for the charter of two self-sustaining roll-on/roll-off ships.

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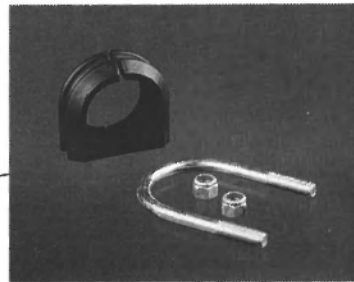
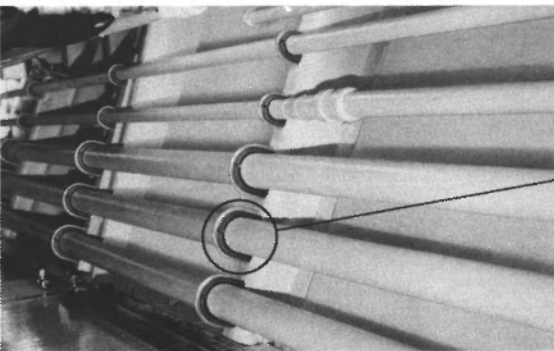
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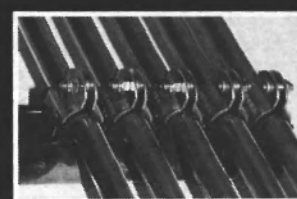
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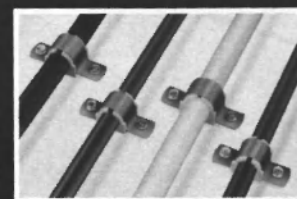
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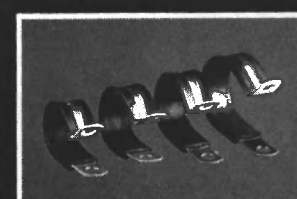
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Excursion Cat Under Construction At Metal Boat Of Vancouver

The latest multihull to take shape at Metal Boat in Vancouver, Wash. is a USCG-certified, 65 x 33-foot catamaran designed to provide water sports by day and dinner cruises at night. The owner is Fair Wind Inc. of Kona, Hawaii, a business that has been running coastal excursions on a modified sailing

trimaran for over 20 years.

According to Metal Boat president **Don Becker**, the 149-passenger design has been done in-house because the owner had exact specifications of what he wanted, and several architects questioned such requirements as the sail-assist rig, the water slide and the seamless-keel construction.

Power is twin Luger L6109A's, giving 600 hp at 2,300 rpm. Reduction gear is Twin Disk 2.5:1 with a 7 degree down angle, turning 30" x

22", four-bladed, bronze propellers. Cruising speed is estimated at 12 knots. 110 volt current will come from a bank of gel-cell batteries and an inverter, charged from the Lugers by a 200-amp alternator. 640 gallons of freshwater will be carried in 4 x 165 gallon tanks in the bridgedeck.

For more information on Metal Boat,

Circle 72 on Reader Service Card

Schottel Supplying Navigators Up To 200 kW With Hydrostatic Drive

The Schottel Group is now able to supply Navigators rated up to 200 kW with both mechanical (Rudderpropeller) and hydrostatic drive through its international sales and service network. This is the outcome of a cooperation agreement concluded recently with the French company Hydro-Armor. Hydro-Armor's experience with the construction of hydrostatic drives extends back to 1971.

Under the terms of the agreement, Schottel will equip its Navigators with hydraulically driven propellers built by Hydro-Armor and will market the complete package worldwide. Under the name Schottel-Hydro-Armor (SHA) These systems cover a power range of 62 - 200 kW and are designed for the propulsion of barges, pontoon ferries and fishing craft.

Both companies will remain completely independent and are convinced that this cooperation and their extended product ranges will improve their competitive position and market shares worldwide.

For more information on Schottel

Circle 76 on Reader Service Card

Count on Trimble GPS to get you into dire straits.

And out of them, of course.

Because if you're bold enough to steer your vessel through rocky channels, into fog-shrouded harbor entrances, or to the edge of international boundaries, chances are you're already more than familiar with the risks.

And you've probably heard about differential GPS—the technology that corrects errors caused by selective availability (S/A)

Trimble GPS products use differential GPS corrections to give you ultra-precise navigation in treacherous waters.

signal scrambling, to give you ultra-precise position and speed information.

Well, that's where Trimble's NavBeaconXL™ comes in. That and a few other products from Trimble.

The solution starts with differential ground stations along the shore, which compare their positions to those reported by GPS satellites. The stations calculate the difference, determine whatever corrections are needed, and broadcast that information out to sea via radio waves.

The NavBeaconXL then picks up these signals and passes the corrections on to your other equipment. For instance, Trimble's NavGraphicXL GPS™, NavTracXL GPS™, or even products made by other manufacturers.

Regardless, with Trimble differential GPS, your accuracy will be better than ten meters and a tenth of a knot.

Which is probably all you need to know when it comes to differential GPS technology. Unless, of course, you care to know more—in which case you can call Trimble at 1-800-949-9444 for a free book, *Differential GPS Explained*.

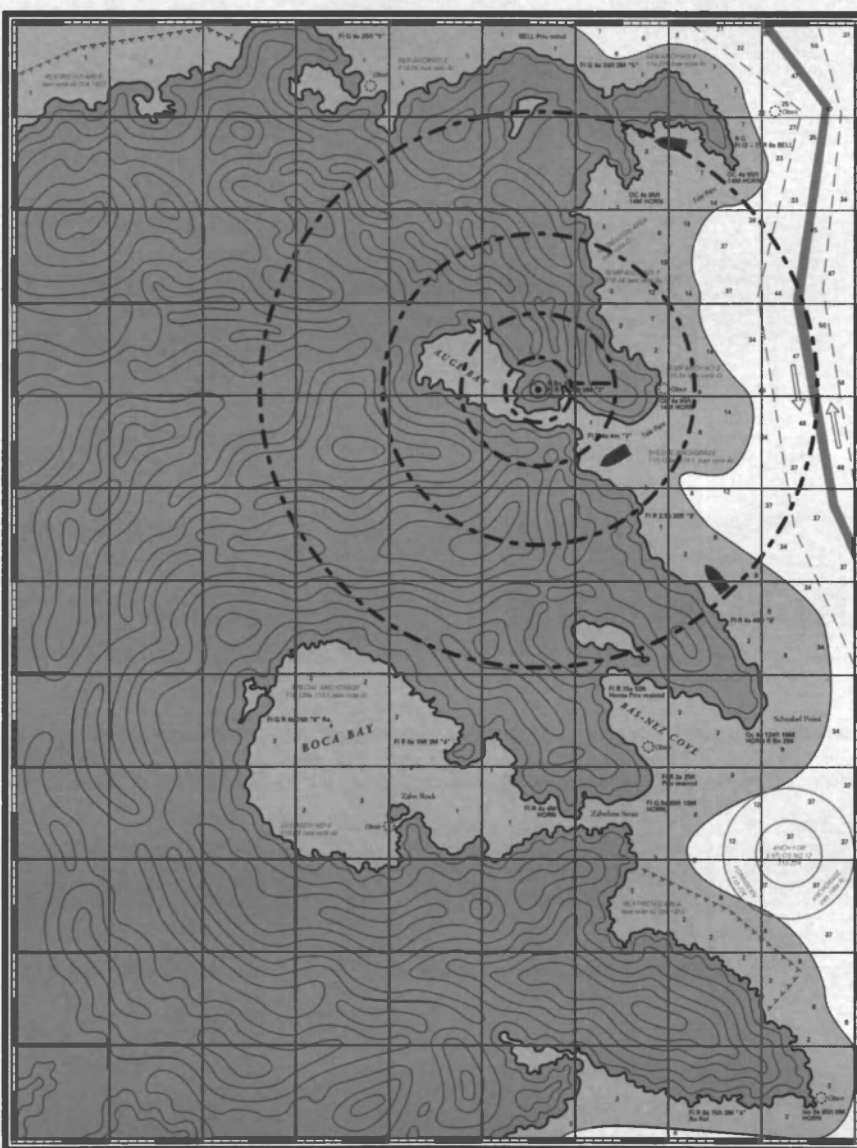
Or, you could just call for the name of your nearest Trimble marine retailer—and get ready to conquer those treacherous waters.



Trimble

The Leader in GPS Solutions

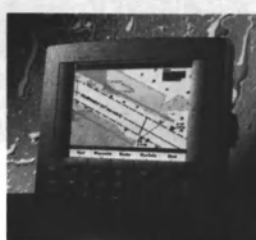
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The NavBeaconXL receives GPS corrections from differential beacons on land, and translates them into the RTCM SC-104 format accepted by many GPS receivers. This Trimble receiver is so sensitive that it's capable of picking up even the weakest of signals.



Thanks to NavTracXL GPS's innovative user interface, all you have to do is point your boat down the "road" on screen and you'll quickly see the best route to reach your destination. The NavTracXL shows all the information you need on a high-contrast display.



With the NavGraphicXL GPS, you can track a moving image of your boat on a real nautical chart. You can zoom in for delicate maneuvering or zoom out for an overview of your voyage—all on a high-contrast screen that's easy to read in direct sun or total darkness.

U.S. Company Buys Damaged Canadian-Owned Tanker

A U.S.-owned shipping company located in Singapore bought a Canadian-owned tanker that burned in a collision with a container ship in the Straits of Malacca in September 1992. The crash killed more than 20 crew members on the two ships and spilled about 13,000 tons of crude oil into the Straits.

The Neptune Orient Lines, which is controlled by the Singapore government, paid approximately \$7 million for the 95,900-ton Nagasaki Spirit. The current market value for a tanker of its size is \$12 million. The ship is to be renamed and will join the Neptune Orient Lines after repairs, reportedly costing \$29 million.

Rexroth Introduces New Pilot House Controls Equipment Catalog

The Rexroth Corporation, pneumatics division, of Lexington, Ky., has introduced a new 53-page catalog presenting its full line of pneumatic control equipment designed to provide pilot house control of main engines and reverse gears for optimum vessel maneuvering.

Technical specifications are provided for the wide selection of maneuvering control valves, pre-assembled Logicmaster® and Gearmaster® control units, and accessory devices required to provide complete shipboard control installations.

Ingalls Awards VLCC Design Package To Marinex

A contract has been awarded to Marinex International Inc. of Englewood, N.J., for the preparation of a design package for the bow and stern sections of a twin-screw very-large crude carrier (VLCC). Ingalls Shipbuilding, which awarded Marinex the contract, announced earlier it would team up with both Marinex and Metro Machine Corp.

of Norfolk, Va., the builder of "Marc Guardian" double-hull mid-bodies for VLCCs.

Blount Launches Circle Line Ferry

Blount Marine of Warran, R.I., recently launched a Circle Line Ferry to operate between the Battery, Ellis Island and the Statue of Liberty in New York City. The 800-passenger ferry is 132

feet long, 32 feet wide with a 9-foot draft. The main propulsion is two Cummins diesel engines. The ship's service power is two Cummins, 70 kW generator sets. The marine gear is Twin Disc MG-518. The steering system is supplied by Wagner Electric-Hydraulic.

Sap-Seal Products Offers Threaded Plastic Cap

Sap-Seal is a threaded plastic cap

for protection of nuts and bolts. It is filled with an anti-corrosive lubricant to prevent nuts and bolts from rusting and corroding. It can withstand temperatures from -40 to 200 degrees F. It helps protect against accidental thread damage, and thus can help reduce downtime costs. The product also saves stud/bolt replacement costs, and is designed to be used in virtually any application.

For more from Sap Seal,

Circle 44 on Reader Service Card

INTRODUCING THE NEWEST ADDITIONS TO THE JOHN DEERE DIESEL FLEET

Two new 6.8 L diesels join the growing line of John Deere marine engines.

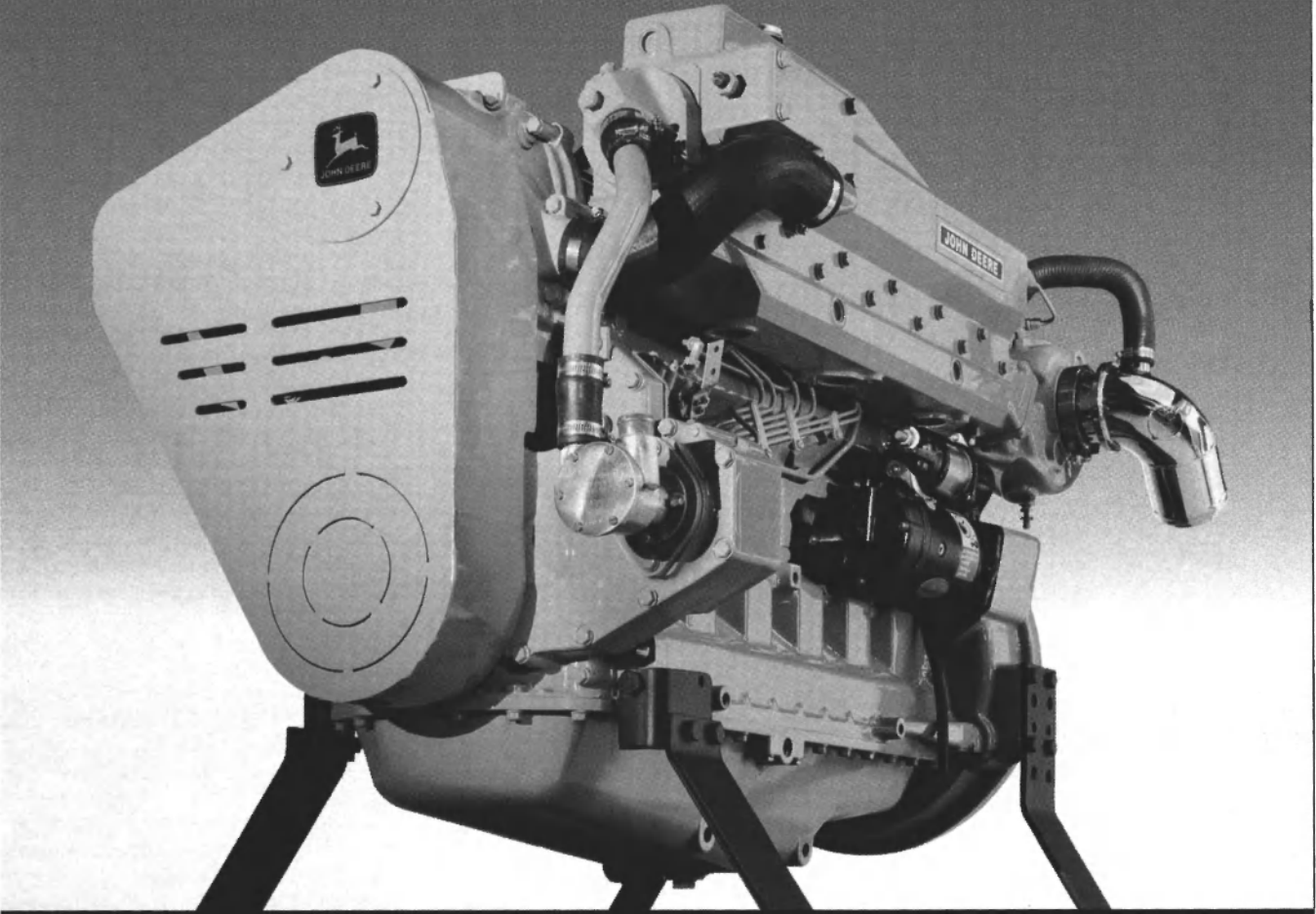
The naturally-aspirated 6068DFM delivers 130 horsepower, and the turbocharged 6068TFM produces 175 horsepower.

Like all John Deere engines, these quiet, smooth-running, 6-cylinder in-line diesels are loaded with features that will help keep your boat on the water.

One-piece blocks with seven main bearings, dynamically-balanced hardened crankshafts, individually replaceable wet

cylinder liners, and same-side service points provide reliable performance and simple maintenance.

Check the chart below for brief specs on all five of our engines, then contact your John Deere engine distributor for details. Or call Deere Power Systems, 319/292-6060. FAX: 319/292-5075.



MODEL	4039DFM	4045TFM	6068DFM	6068TFM	6076AFM
Displacement	3.9 L	4.5 L	6.8 L	6.8 L	7.6 L
Configuration	4 cyl	4 cyl	6 cyl	6 cyl	6 cyl
Power	80 hp	115 hp	130 hp	175 hp	250 hp
Aspiration	Natural	Turbo	Natural	Turbo	Turbo/After

To find out more about John Deere diesel engines for marine applications, contact one of our authorized distributors listed below.

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Tel: (314) 868-8620 • Fax: (314) 868-9314
CK POWER PRODUCTS CORPORATION OF FLORIDA
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IMSA Provides Technical Support For Marine Designers

The International Marine Software Associates (IMSA), formed in 1991, is an association to help marine designers with technical support on software.

First presented to the 1991 SNAME Marine Computers Symposium, the IMSA Definition File

(IDF), which is an ASCII-based standard offering a unique solution for passing hull-related data between cross-platform and cross-product environments, has since been adopted by commercial marine software developers and end-users from around the world, such as the U.S. Navy, the Canadian Defense Dept., Draper Labs, Northstar Software and others.

IMSA is currently composed of five companies, including

HydroComp, Inc. of Durham, N.H.; Design Systems & Services, Inc., of Annapolis, Md.; Creative Systems, Inc.; Albacore Research Ltd.; and Ross-McNatt Naval Architects.

Bender Shipbuilding of Mobile, Ala. has built a computer system based on IMSA software, Macola and in-house programming. "My relationship with the IMSA companies are really more comprehensive than just as software suppliers," said **Joseph H. Comer**, design group

manager at Bender. "They have been 110 percent responsive to support and are eager to provide custom options and improvements when other companies would not even know the possibility."

Established in 1982, HydroComp Inc. is a leader in applied propulsion design software. Its principal product, called NavCad, is a comprehensive program for resistance and powering, and propeller calculations. Design Systems & Services, Inc. has provided naval architecture design and analysis tools to more than 125 users in government and industry since 1983. Its prime product, FastShip, has been adopted by the U.S. Navy as the surface modeling tool of choice.

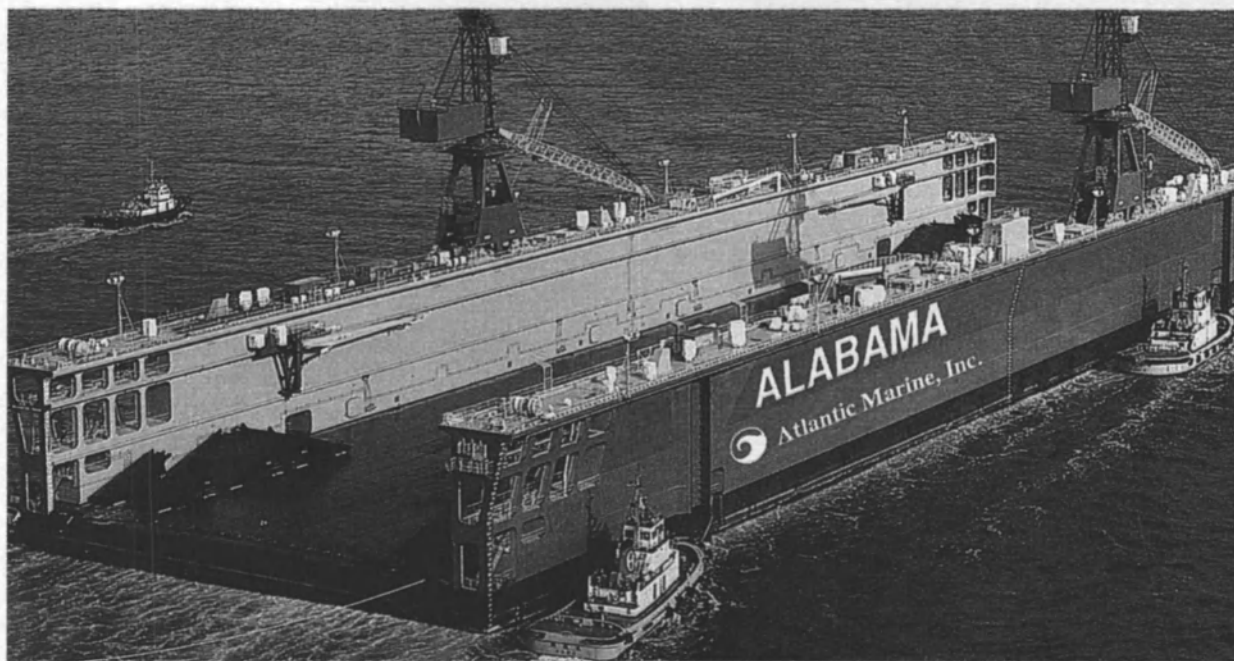
Creative Systems, founded in 1972, was established to improve the efficiency and accuracy of stability calculations available to naval architects. Development began with a product known as SCEND.

Albacore Research Ltd., Victoria, British Columbia, was established in 1990 and now conducts its own research and development maintaining close affiliation with the University of Victoria.

For more information on IMSA

Circle 43 on Reader Service Card

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Diesel Diagnostic System Introduced By Macsea

Macsea Ltd. of Stonington, Conn. has announced the availability of DEXTER (Diesel Expert Test Engineering Reasoner), an advanced expert diagnostic system for improving diesel engine performance and reliability. The PC-based computer system is designed to troubleshoot many diesel engine operating problems without the need for open physical inspections.

DEXTER is the outgrowth of a five-year research and development project with the U.S. Maritime Administration and American President Lines involving the application of artificial intelligence technology to engine diagnostics. Subsequent to the research, Macsea developed a commercial version of the diagnostic system and has recently begun marketing it to the marine industry.

DEXTER's primary function is to determine the root cause of alarm conditions, thereby assisting the engine operator in taking necessary corrective actions. Its built-in diagnostic functions conduct on-line engine measurements, evaluate engine performance, identify probable reasons for abnormal conditions, and suggest appropriate corrective maintenance actions. The system also conducts automatic trending analysis on all monitored engine measurements and is able to predict future alarm conditions and probable engine problems.

For more information on DEXTER from Macsea Ltd.,

Circle 48 on Reader Service Card

Thrustmaster Announces Triple Domestic And Foreign Contracts

Thrustmaster of Texas has been awarded several contracts of late, which include:

Houma Fabricators of Houma, Louisiana, contracted for the supply of two high-pressure tunnel thrusters for a casino ship, which is a repeat order of the equipment supplied by Thrustmaster for the Dubuque Casino.

Bender Shipyard contracted the supply of propulsion units and tunnel thruster for the dewatering casino vessel the yard building at its Braitwaite, Louisiana. Equipment to be supplied includes two hydraulically-powered, 180-degree steerable, through-hull mounted thruster units for propulsion assist and steering of the vessel.

Also to be supplied is a transverse mounted, hydraulically-powered tunnel thruster to be used only for assistance when docking and undocking.

Thrustmaster's recently appointed agent in Australia, Antelope Engineering Pty. Ltd., has announced its first order for Thrustmaster products: two 175-hp tunnel thrusters. Antelope Engineering, with offices in Sydney and Perth, have several other contracts under negotiation.

Finally, Thrustmaster's agent in Pakistan, Mansoor & Sons, Karachi, Pakistan, has recently won an order for two outdrive units from Karachi Shipyard and Engineering Works Ltd. These units are for the Pakistan Navy and are a repeat order of equipment Thrustmaster supplied two years ago.

For more information on Thrustmaster equipment,

Circle 45 on Reader Service Card

Rice Building Propellers, Nozzles and Rudders For Foss Maritime

Rice Propeller and Metaltec of Mazatlan, Mexico was given a contract by Nautican Enterprises, Ltd., of Vancouver, Canada to construct two sets of Patented Nautican nozzles and Nautican designed skewed propellers and triple rudders, to be installed on the M.V. Barbara Foss, owned by Foss Maritime of Seattle. Foss reportedly selected Nautican nozzle system because of the necessity to achieve maximum bollard pull and maneuverability without losing free running speed.

The nozzles and propellers will have a 108-inch diameter. The propellers will be constructed of grade 4 Ni Al Bronze, with a three-blade skewed design, and are ABS certified. The triple rudders made a Metaltec will also be 108 inches long and ABS certified.

The M.V. Barbara Foss recently went through sea trials to deter-

mine the effectiveness of all equipment.

For more information on Rice Propeller and Metaltec,

Circle 61 on Reader Service Card

James P. Colie Renovates The M/S Nordic Empress

Marine general contracting firm James P. Colie & Assoc., Inc. an-

nounced that it recently renovated the M/S Nordic Empress, which operates out of the Port of Miami.

Renovations to the ship, owned by Royal Caribbean Cruises Ltd., will include: an upgraded 10,200-sq.-ft. tri-level casino; a 500-sq.-ft. expansion of the conference facilities; a new V.I.P. meeting room to be called the "Compass Room;" a new 330-sq.-ft. video arcade; a 1,500-sq.-ft. photo gallery; gift shop modifications; and a new children's room in the theme of a space station.

The M/S Nordic Empress was in drydock at Norshipco in Norfolk, Va. for six days in May for the work.

James P. Colie & Associates, Inc. is a marine general contracting firm which specializes in cruise ship interiors and renovations. The company has completed more than 650 projects on 35 vessels. For more information on James P. Colie & Associates,

Circle 52 on Reader Service Card

Navigating the Maritime Market

Who will get you through?

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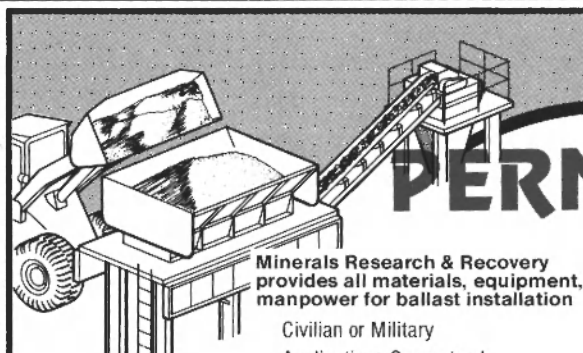
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Circle 176 on Reader Service Card

Saab Marine Electronics Grows With Control Systems

Installing its first Saab TankRadar system in 1976, Saab has since become a leading supplier of level gauging systems for tankers, reportedly garnering a 40 percent share of the global market since 1980.

More than 800 tankers have been equipped with Saab TankRadar systems, and approximately 98 percent

of Saab Marine's sales are exported to some 50 countries around the world.

Deliveries of Saab Cargo Control Systems increased during 1992. First installed on an asphalt barge in 1988, since then 35 ships have been equipped with the Saab Cargo Control System.

In October 1992, Saab Marine Electronics received a third-party certification for development, design and manufacture of radar-based level gauging systems in accordance

with ISO 9001 international quality standards.

For more information on Saab Marine Electronic's products and services,

Circle 50 on Reader Service Card

Viking Offers Array Of Safety Products

Viking Life Saving Equipment (America), Inc.'s marine safety prod-

ucts, manufactured according to standards of quality, include I Launchable and regular throw board SOLAS- and USCG-approved inflatable liferafts, single- and track marine evacuation slide manufactured under the AQ, and ISO 9001 requirements.

Viking of Miami also supplies other products such as water vated life jacket lights, life jacket immersion fire suits, TPA 1 emergency food and M.O.B. Re Boats, enabling the company to almost any demand concerning safety at sea.

For more information on Vik

Circle 51 on Reader Service Card

Vecom Offers Veclean Line To Help Comply With IMO OPA 90 Regulations



Farouk Nefzi,
Vecom product manager

Designed as an alternative to traditional cleaning products, the Veclean range of products is touted as able to perform all of the cleaning functions in the engine room, including carbon removal, electrical parts cleaning, tank cleaning, general cleaning, oil spill dispersing and oil spill clean-up equipment.

The Veclean products enable the residual water to be pumped overboard via the oily water separator and reportedly will not tie-up slob or sludge tanks with a lot of emulsion.

Using dispersants at sea has become a problem on the political and environmental fronts.

Therefore, Vecom has introduced a new dispersant to the shipping industry.

Approved by the Ministry of Agriculture, Fisheries and Food U.K. as a type II/III product and tested by Warren Spring Laboratory, the product has an extremely low marine toxicity, is totally biodegradable and contains no petrochemical solvents.

Finally, to assist shipping companies to comply with OPA 90 and IMO regulations Vecom has developed an oil spill kit.

Included in the kit are absorbents, pressure hand sprayer, scupper pipe plugs, deck mats, booms filled with organic material, oil seals, wipes, etc.

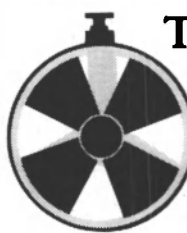
For more information on Vecom's environmentally sound products,

Circle 16 on Reader Service Card

Maritime Reporter/Engineering News

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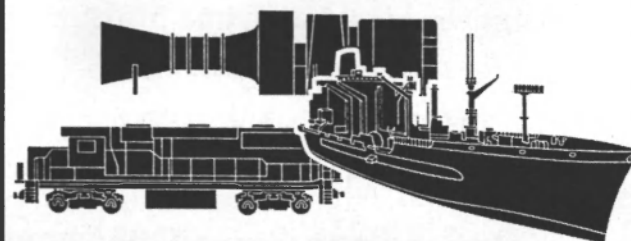
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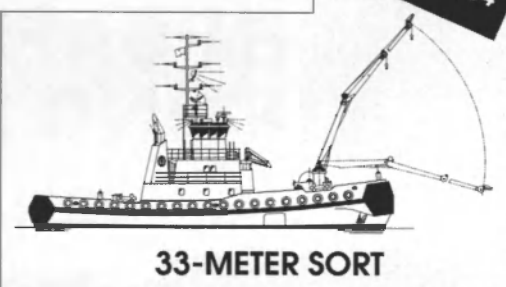
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FAST CAT 120

Circle 146 on Reader Service Card

Boats & Barges

SWATH Ocean System Delivers Pilot Boat To Houston Pilot



The Houston is a Small Waterplane Area Twin Hull (SWATH) Ocean System's 2000 class coastal pilot craft employing reportedly the world's first application of SWATH technology to offshore pilotage.

The craft is 67 feet long, with a maximum beam of 37 feet and full load draft of eight feet. Its maximum intermittent speed is 27 knots and its maximum range is 2,000 nautical miles. As a result of the twin displacement hulls and separation of propellers, the craft is able to "come along side" ships at speed for the transfer of pilots. Overcoming the suction encountered along

side a ship and pulling off is easily accomplished by the SWATH pilot. Directional stability, maneuverability and a design which is becoming widely accepted as a stable operational platform all combine to produce a craft ideally suited for the rigors of pilotage.

SWATH Ocean Systems is committed to product superiority and has earned a reputation in SWATH technology by lessons learned over two decades of research and development.

For more information on SWATH Ocean Systems,

Circle 79 on Reader Service Card

Argonautics Completes Transport Feasibility Study For CDNSWC

Argonautics Marine Engineering, of Sausalito, Calif., has recently completed a feasibility study on the transport of deployable waterfront facility (DWF) modules for the Carderock Division, Naval Surface Warfare Center (CDNSWC). The study identified the capabilities of presently existing commercial heavy lift barges and vessels with respect to transporting DWF modules.

The dry tow option by barge was compared to the dry transport option by self-propelled heavy lift vessel. Aspects such as load-out procedures, stability during (de)ballasting, cribbing and seafastening arrangements, etc., were addressed.

Alternative cribbing and seafastening methods were proposed to substantially reduce the time required for deck preparations and seafastening.

Frank van Horn, president of Argonautics Marine Engineering, said, "An athwartship's stowage of the modules is the most economical way, but this will result in a relatively large overhang. Design changes to the DWF modules were recommended to limit the effect of slamming on these overhanging parts of the hulls."

Centurion Could Be Configured As Special-Op Sub

According to Navy sources, the first of the proposed Centurion Class

nuclear attack subs may be configured for special operations missions, marking a radical departure from traditional U.S. submarine theory. The plan is supported by the Joint Chiefs of Staff, the Navy, leaders in the special operations community and some members of private industry. Under its "Recapitalization of the Navy" long-range acquisition plan, the service would start construction of a special operations submarine in fiscal year 1998 or 1999, with long-lead funding requested two years earlier to begin building its nuclear power plant. While the "Commando Centurian" would still be equipped with torpedo tubes and a combat system, space would be specially set aside for as many as 65 special operations troops. Following standard nomenclature, the sub would be called an SSPN and would be fitted with a diver lock-out chamber and a dry-deck shelter to carry one or more swimmer delivery vehicles.

The program would be useful to the U.S. submarine building base, as the SSPN's lack of a sophisticated fire control system and large torpedo load would keep its costs down, making it possible to have more than one sub built each year.

The Russians have two Uniform Class nuclear submarines especially configured for commando operations, a practice deemed unnecessary by the U.S. Navy who considered its boats to be capable of all types of missions equally well. The Uniform Class displaces 2,000 tons submerged, while the Centurian will probably be in excess of 6,000 tons. The Navy is looking to design the Centurian with modularity in mind, giving it the ability to tailor the sub for specific missions.

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Circle 306 on Reader Service Card

STC Intl. Marine Acquired By Global Group, Changes Name

STC International Marine has changed its name to Marine Technology International, and is now part of a global group of companies whose core business is mobile communications.

During its 65 years of operation, firstly as the International Marine

Radio Company, part of the ITT group, and later as STC International Marine, the company equipped such vessels as the White Star Liners, Cunard's Queen Mary and Queen Elizabeth, as well as the refit of the QE2. It was recognition of that leadership in the commercial shipping market, especially GMDSS, where last year STC International Marine equipped over 70 vessels to meet the new regulations that led to the radio and communi-

cations division being bought from Northern Telecom Europe by an international group which includes Mobile Telesystems Inc. of Washington, D.C.

An agreement was reached in January of this year to acquire the most important part of the business, the radio communications products division. Through the acquisition of STC International Marine's communications and products division, MTI has created a new major force in

marine communications.

Mobile Telesystems, Inc., leaders in satellite communications, provides the new company with a complete range of well known and proven systems, which include equipment for Inmarsat A and communications. To follow later this year is MTI's new Inmarsat Satcom for digital voice and data communications, and in 1994/1995 equipment to operate on the proposed Inmarsat B system.

The range of products and services offered by the new company includes GMDSS solutions.

For more information on Marine Technology International Ltd.,

Circle 54 on Reader Service Card



The world's top shipbuilders turn to New Zealand for waterjets

With waterjets the preferred propulsion system for new age fast ferries, work and patrol boats, commercial influences demand reliability and engineering excellence. That's why more and more shipbuilders are turning to New Zealand, the home of Hamilton Jet.

For Japan, a nation leading the way in advanced technology and quality assurance

techniques, the only choice when it came to selecting the propulsion system for a new ferry was Hamilton Jet. A 33 metre, 35 knot passenger ferry built by Goriki Shipyard, "Nyenufabushi" was commissioned to carry passengers quickly between offshore islands. Crucial design factors were high speed, reliability, passenger comfort and outstanding manoeuvrability. Construction had to be certified to NKK standards. All these were met using the advanced technology and innovative features found only in Hamilton waterjets, adding "Goriki Shipyard" to an impressive and ever growing reference list of satisfied customers worldwide.

Hamilton Jet has built its reputation on providing the best marine jet propulsion systems anywhere in the world. That's why designers from the most technically advanced nations recognise New Zealand quality and expertise and have confidence in specifying Hamilton Jet.



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Circle 166 on Reader Service Card

Alfa Laval Desalt Launches New Freshwater Maker For Drilling Rigs

Denmark's Alfa Laval Desalt recently unveiled its latest freshwater maker, a unit specifically developed for use onboard drilling rigs.

The new double-effect freshwater maker, D-PU-2-36-C-100/12, has been developed in direct response to the offshore drilling industry's requirements. Manufactured in corrosion-resistant materials, the unit reportedly offers pure freshwater at half the energy consumption as a single-effect unit.

Copenhagen-based Alfa Laval Desalt is well known in the offshore and marine industries as a leading supplier of freshwater makers, with more than 26,000 installations, including production platform units in the U.K. and Norwegian sectors of the North Sea and the Gulf of Mexico, for operators such as Statoil BP and EE Caledonia.

For more information on Alfa Laval Desalt's new freshwater maker,

Circle 59 on Reader Service Card

Hopeman Bros. Announces Letter Of Intent For Outfitting Of American Queen

Hopeman Brothers, Inc. and McDermott Shipyard, Inc. announced a letter of intent to provide turnkey interior outfitting for Delta Steamboat Co.'s "American Queen," formerly the "Belle of America." The vessel will be built by McDermott Shipyards and delivered in the spring of 1995.

The project marks the first sizable steam-powered riverboat passenger vessel built in almost 20 years. The "American Queen" will have a capacity of 420 passengers and 150 crew, and will be outfitted as a classic river steamboat reminiscent of the 19th century.

For more information on the services from Hopeman Brothers,

Circle 49 on Reader Service Card

Maritime Reporter/Engineering News

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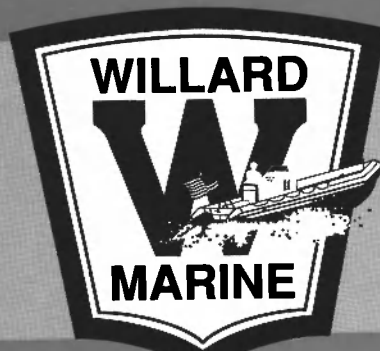
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Circle 310 on Reader Service Card

Simship Offers Consulting, Training To Maritime Industry

Simship Corp. is a marine consulting and training firm serving the maritime industry and naval community. The firm offers a range of products and services to improve the safety and effectiveness of marine and naval operations. Several products are offered to support ship-

board and shoreside personnel and operations, including: full-scale simulator training and certification services; turnkey desktop systems for in-house training and evaluation; productivity analysis and design of shipboard and ship-shore operations and organization; and forensic studies and demonstrations of ship operations and performance. Simship presently offers one of the world's most advanced and comprehensive marine simulation fa-

cilities, the Simulation Training and Research (STAR) Center located in Dania, Fla.

For more information on Simship,

Circle 47 on Reader Service Card

Castrol Introduces Advanced Grease For Marine Use

Castrol has recently introduced Castrol Spheerol SX2, a high-per-

formance calcium sulphonate complex base grease. Specifically developed for use in the highly aggressive conditions in marine and offshore environments, Castrol Spheerol SX2 is suitable for a wide range of applications including wire ropes, open gears, small to medium sized roller bearings, fairleads, chain drives, etc.

Extensive in-service and laboratory trials have proven the advanced properties of Castrol Spheerol SX2. These characteristics give optimum lubrication and corrosion protection over a wide operating temperature range of - 20 degrees to + 150 degrees C. The NLGI rating of this solvent free grease is 2 and drop point in excess of 300 degrees C.

For more information on Spheerol SX2 from Castrol,

Circle 57 on Reader Service Card

Adams Boat Co. Delivers Ferry Tender To Jumbo Barge



The "Diamond Island Ferry," recently built and delivered by Adams Boat Co.

Adams Boat Co., Inc., a Madison, Ind.-based custom boat builder, recently delivered a 40-foot by 12-foot ferry tender to Jumbo Barge Co. of Evansville, Ind. Named "Diamond Island Ferry," it will be used to push a 20-foot by 70-foot ferry flat to Diamond Island, Ky. on the Ohio River. It will carry farm and oil drilling equipment.

The hull is constructed of 5/16-inch plate with three watertight bulkheads. It is powered by a single Detroit 671 engine and turns a 30-inch four-blade propeller through 2.5:1 gears. Steering is hydraulic and there is one steering rudder and two flanking rudders.

A sister ship is under construction for Gough Farms of Henderson, Ky. For more information on the boat building capabilities of Adams Boat Co.,

Circle 65 on Reader Service Card

Japan's MHI To Build VLCC For Mitsui OSK

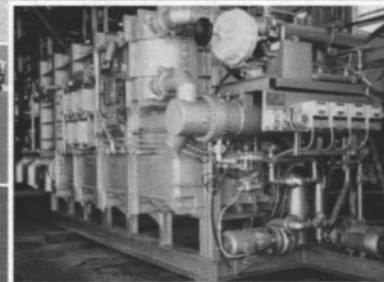
Mitsubishi Heavy Industries, Ltd. (MHI) has agreed to build a VLCC for major Japanese shipping company Mitsui O.S.K. Lines Ltd.

The tanker will be a single-hulled, 240,000-dwt tanker. It will be completed in early 1996 and will be hired by Mitsubishi Oil Co. to carry its crude oil.

The value of the ship was not disclosed, but a VLCC of this size generally costs around \$90 million.

MHI won an order in March of 1993 to build a similarly-sized tanker for Japan's Navix Line Ltd.

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Standard Communications Offers Nearly 25 Years Of Product Excellence



Standard Communications' HX220.

"Don't choose a maritime industrial handheld based simply on portability," said **Ken Ungar**, vice president of the Marine Products Div. of Standard Communications Corp. of Los Angeles. "The most important feature is reliability in hazardous environments. You need to be able to depend on your radio and communications capability in the worst case scenario."

The product commitment made by Standard Communications is to deliver the best in tough, reliable communications, a mission which the company has followed for nearly 25 years.

Standard Communications Corp. has been a marine electronics industry leader since the company introduced the first solid-state VHF marine radio in 1969. The Marine Products Division line of marine radios (called Horizon) is a top selling and reliable product. The company received the National Marine Electronics Association Award for Design and Engineering Excellence for its fixed-mount and handheld radios for the 10th time in 12 years.

Standard Communications meets marine communications requirements with a choice of handhelds, the HX220AS and the HX340. Both radios meet industry standards for use in hazardous environments and are backed by the company's three-year limited warranty on parts and labor.

The HX220AS, like the conventional HX220S, features all U.S., Canadian and International marine VHF channels.

The HX340 is available in UHF or VHF bands. Switchable power on the UHF version is four watts high and two watts low; on the VHF, five watts high, one watt low. The microcomputer circuitry is engineered for impact and vibration resistance to ensure performance.

For more information on Standard Communications' products,

Circle 55 on Reader Service Card

Harwich Haven Authority Chooses RMSL Traffic Systems For New System

Harwich Haven Authority, the harbor authority responsible for traffic movement in one of England's busiest shipping estuaries, has chosen RMSL Traffic Systems to supply and install a new system that, for the first time, will transmit real time raw radar video from one of the

remote radars of the Harwich Traffic Surveillance System (TSS), to port control.

The installation became operational last month.

"RMSL had the refreshing attitude of addressing our needs, rather than selling us a standard technical solution," said Captain **Ian Whale**, marine manager and harbormaster. He said one of the attractions of the new radar transmission solution proposed by RMSL will be its com-

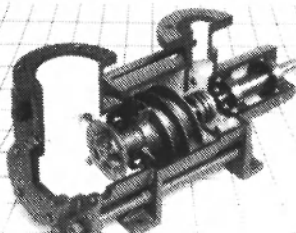
patibility with the existing radars. "It will cost less than fiber optic, which we also investigated, but promises to achieve the same quality of raw radar video over telephone circuits."

RMSL Traffic Systems is a fast growing traffic management company.

For more information on RMSL,

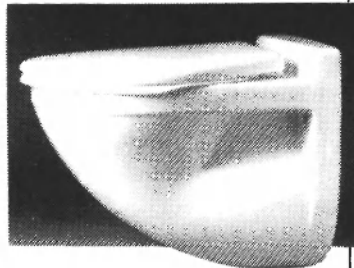
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The Tanker Market

Having to contend with an aging fleet, stricter environmental legislation, including both OPA 90 and MARPOL 73/78, as well as closer scrutiny by charterers, classification societies and insurers, the demand for tanker tonnage is expected to rise through the 1990's.

This demand will not only encompass the single- and

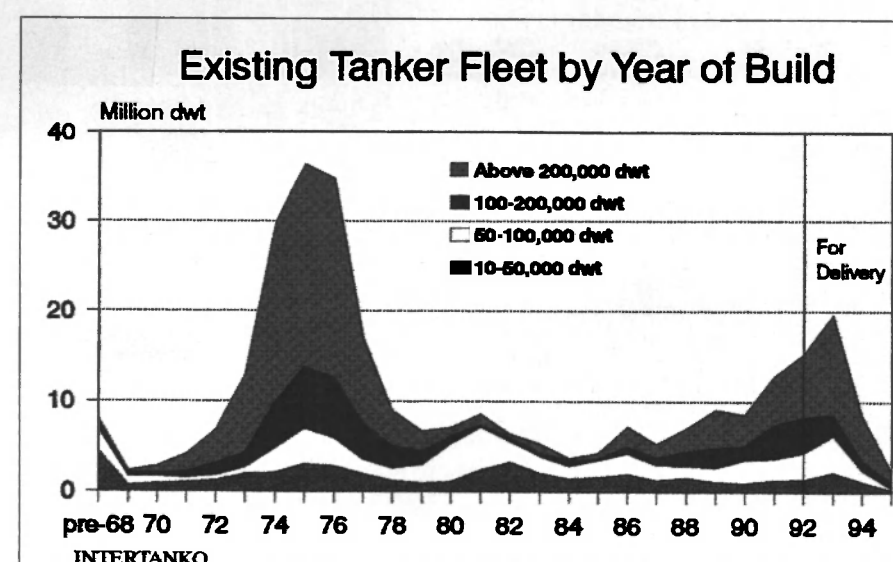
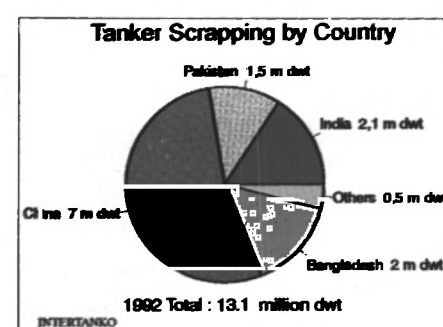
double-hull petroleum-carrying types, but also both LNG and LPG types.

Landmark contracts, such as the approximately \$1 billion deal between Kvaerner Masa-Yards and Abu Dhabi National Oil for four LNG tankers (see page 19, this issue, for further details) are just starting to roll in.

A breakdown of oil tankers completed during 1992, and possible indicator of future business, shows that Japan, not surprisingly, built the most with 141 tankers completed representing more than 4.6 million gross tons. Rounding out the top five, by gross tons completed, were: South Korea,

33 vessels, 2.5 million gross tons; Spain, seven vessels, 212,399 gross tons. (Source: Lloyd's Register)

The charts on the ensuing pages illustrate the current world order book for all tanker types.



TANKERS & COMBINED CARRIERS ON ORDER

(AS OF JANUARY 1, 1993)

Owners	DWT	Yard No.	Delivery	Name	Type	No.	Owners	DWT	Yard No.	Delivery	Name	Type			
ARGENTINA						8997	VELA INT. MARINE	300,000	148	4th Qtr. '94		Crude			
5	TRANS-ONA	30,000	Astilleros	67	1st Half '94	ONA-TRIDENTE		8998	VELA INT. MARINE	300,000	149	1st Half '95	Crude		
RAZIL						FINLAND									
0	PETROBRAS	33,000	Caneco	316	July '93	LOBATO	Products	8773	NESTE O/Y	91,000	Masa	1318	Jan. '93	NATURA	Cr./Prod.
1	PETROBRAS	33,000		317	July '94	LONDORNA	Products	GERMANY							
2	PETROBRAS	33,000		318	Sept. '94	LORENA	Products	9037*	RIGEL SCHIFFAHRTS	10,750	Math-Thesen	124	1st Qtr. '93	ELBESTERN	Products
5	PETROBRAS	55,000	CCN	188	1st Qtr. '93	PEDREIRAS	Cr./Prod.	8978	RIGEL SCHIFFAHRTS	10,750		125	3rd Qtr. '93	JADESTERN	Products
19	PETROBRAS	55,000		189	Mid '93	POTI	Cr./Prod.	8979	RIGEL SCHIFFAHRTS	10,750		126	4th Qtr. '93		Products
4	PETROBRAS	36,000		193	End '93	ITAMONTE	Products	INDIA							
15	PETROBRAS	36,000		194	1st Qtr. '94	ITATUBA	Products	8030	SHIPPING CORP. OF INDIA	85,200	Cochin	009	Aug. '95		Crude
18	PETROBRAS	43,000	EMAQ	407	May '93	ITAJUBA	Products	8811	SHIPPING CORP. OF INDIA	85,200		010	End '95		Crude
19	PETROBRAS	43,000		408	Sept. '93	ITAJUBA	Products	INDONESIA							
10	PETROBRAS	43,000		409	Mar. '94	ITAPERUNA	Products	9045*	UNITED TANKERS	16,000	Kodja		3rd Qtr. '94		Products
14	CHEVRON CORP.	132,000	Ishibras	164	Jan. '93	GEORGE SHULTZ	Crude	9047*	UNITED TANKERS	16,000			4th Qtr. '95		Products
12	CHEVRON CORP.	132,000		165	Oct. '93	CONDOLEZZA RICE	Crude	9046*	UNITED TANKERS	16,000			2nd Qtr. '95		Products
35	CHEVRON CORP.	150,000		166	Feb. '94		Crude	9048*	UNITED TANKERS	16,000			2nd Qtr. '96		Products
34	CHEVRON CORP.	150,000		167	Oct. '94		Crude	ITALY							
14	PETROBRAS	33,000	Verolme	8100	Sept. '93		Products	8516	M.E. MARITTIMA EMILIANA S.P.A.	11,500	Eserozio	777	Feb. '93	LADY MARIA LAURA	Chemicals
10	PETROBRAS	29,400	Imabari	895	2nd Qtr. '93		Products	8965	FINNAV	11,000		835	Sept. '93		Products
13	PETROBRAS	33,000		899	Mar. '93		Products	8966	J.O. ODFJEL	14,000		845	Dec. '93		Products
ULGARIA															
36	OSLO BASED GROUP	14,000	Bourgas	121	1st Qtr. '93		Products	8425	ALMARE DI NAV. S.P.A.	84,300	Fincantieri	5891	May '93	MAREA	Crude
37	OSLO BASED GROUP	14,000		122	Dec. '93		Products	8685	PREMUDA SHIPPING	84,300		5892	July '93		Crude
38	OSLO BASED GROUP	14,000		123	Dec. '94		Products	8757	ALMARE DI NAV. S.P.A.	84,300		5904	Dec. '93		Crude
39	OSLO BASED GROUP	14,000		124	Dec. '95		Products	8758	ALMARE DI NAV. S.P.A.	84,300		5905	April '94		Crude
88	NAV. MAR. BULGARE	29,000	Dimitrov	354	1st Qtr. '93	PARNAR	Chemicals	8769	ALMARE DI NAV. S.P.A.	84,300		5906	Oct. '94		Crude
89	FIONA SHIPPING	29,000		355	2nd Qtr. '93	ANDREA	Products	8428	ALMARE DI NAV. S.P.A.	84,300		5907	Mar. '95		Crude
HINA															
23	CHINA OCEAN SHPG. CO.	35,000	Bohai		2nd Half '93		Products	8814	FINAVAL S.P.A. DI NAV.	32,500		5918	4th Qtr. '93		Products
22	CHINA OCEAN SHPG. CO.	35,000			1st Half '94		Products	8779	FERMAR	30,000		5919	1st Half '93		Products
36	BOHAI OFFSHORE PET.	82,000	Dalian		3rd Qtr. '93		Crude	8774	AGIP	140,000	Venice	5925	July '93		Crude
52	TAIWANESE INTERESTS	44,000			1st Qtr. '93		Products	8775	AGIP	140,000		5926	Sept. '94		Crude
01	CHINA OCEAN SHPG. CO.	36,000		3401	Jan. '94		Products	8776	GAETANO D'ALESSIO	11,300		5929	Feb. '93	LILIANA D'ALESSIO	Products
02	CHINA OCEAN SHPG. CO.	36,000		3402	June '94		Products	8777	GAETANO D'ALESSIO	11,300		5930	Nov. '93	FRANCESCO D'ALESSIO	Products
47	CASEROS SHIPPING	44,000	PC 380/4		June '94		Products	9052*	GAETANO D'ALESSIO	11,300		5940	April '94		Products
190	LONG REACH SHPG. H.K.	44,000	PC 380/5		3rd Qtr. '94		Products	JAPAN							
42*	NANJING OIL CO.	19,900	T 199/1		Dec. '94		Products	8650	LYKARDOPULO & CO.	285,700	Hitachi	4855	Jan. '93	APOSA	Crude
02	PERTAMINA	44,000	Dalian	T355	Aug. '93		Crude	8691	MARINE MGMT. A/S	280,000		4859	June '93		Crude
195	DALIAN OCEAN SHPG.	60,000	TD 600/2		Mar. '93		Products	8681	H.K. MING WAH SHPG. CO.	280,000		4860	Mar. '93	NEW VICTORY	Crude
196	DALIAN OCEAN SHPG.	60,000	TD 600/3		Dec. '94		Products	8745	RAIANAN GOVT.	280,000		4861	Mar. '94		Crude
148	CHINA OCEAN SHPG. CO.	34,000	Guangzhou		1st Qtr. '94		Products	8713	WILH. WILHELMSEN	280,000		4864	Sept. '93		Crude
179	WORLD WIDE SHIPPING	60,000	Hudong	1195	Mar. '93		Crude	7916	NIPPON YUSEN KAISHA	240,000	IHI	3025	Mar. '93		Crude
154	CHINA OCEAN SHPG. CO.	34,000		1198	Mar. '93	DA QING 93	Products	8804	CHEVRON CORP.	148,800		3026	Mar. '93		Crude
155	CHINA OCEAN SHPG. CO.	34,000		1199	2nd Qtr. '94	DA QING 94	Products	8857	NAVIX LINE CO. LTD.	258,000		3028	Oct. '93		Crude
180	YANGTZE SHIPPING CO.	16,000	Jiang Zhou		4th Qtr. '93		Products	8876	NIPPON YUSEN KAISHA	258,000		3029	June '93		Crude
165	OMB NV SA	67,500	Jiangnan	2191	Jan. '93	CHEMOIL PRICE	Products	8989	NIPPON YUSEN KAISHA	258,000		3030	Mar. '94		Crude
166	OMB NV SA	67,500		2192	Mar. '93	DOUBLE GLORY	Products	8879	IDEMITSU KOSAN KK	258,000		3031	Aug. '93		Crude
ROATIA															
530	WESTERN BULK CARRIERS	110,000	3 MAJ	661	Sept. '93		Crude	8911	PERTAMINA	35,000		3032	Mar. '93	PERGWO	Crude
392	MARINE MGMT. A/S	40,000	Mosor	202	1st Half '93	MOSOR SAILOR	Products	8912	PERTAMINA	35,000		3033	June '93		Crude
326	LINA SHIPPING CORP.	40,000		204	1st Half '93		Products	8913	PERTAMINA	35,000		3034	Sept. '93		Crude
393	MARINE MGMT. A/S	40,000		205	Mar. '94		Products	8683*	UNITED SHPG. & TRADING	142,000		3036	Feb. '94		Crude
394	MARINE MGMT. A/S	40,000		206	Sept. '94		Products	8652	NEPTUNE ORIENT LINES	95,000	Imabari	1199	Feb. '93	NEPTUNE CORONA	Crude
522	I.C.B. SHPG. AB	137,900	Split	370	June '93	COMORE	Crude	9008	ROSCOE SHIPPING SA	92,000		1210	April '93		Crude
976	TANKERSKA PLOVIDBA	99,900		376	Nov. '93		Crude	8981	TEEKAY SHPG. (CAN.) LTD.	95,000		1212	Sept. '93		Crude
977	TANKERSKA PLOVIDBA	99,900		377	April '94		Crude	9055*	QUALITY TANKSHIP LTD.	91,500		1213	Oct. '93		Crude
017	INDUSTRIJA NAFT E INA	101,000		382	May '95		Crude	8982	TEEKAY SHPG. (CAN.) LTD.	95,000		1214	Dec. '93		Crude
016	INDUSTRIJA NAFT E INA	101,000		383	Oct. '94		Crude	8874	NEPTUNE ORIENT LINES	95,000		1216	May '94		Crude
524	SUNE JOHANSEN	40,000	Ujanik	399	July '93	SUN SAPPHIRE	Products	8875	NEPTUNE ORIENT LINES	95,000		1217	July '94		Crude
470	FLETAMENTOS MARTS.A.	39,500		400	Jan. '93	ACTINIA	Products	8960	MBK	35,000	Kanazashi	3290	Feb. '93		Crude
471	FLETAMENTOS MARTS.A.	39,500		401	Dec. '93	ANEMONIA	Products	8961	MBK	35,000		3295	April '93	BANDAR AYU	Crude
770	UNITED SHPG. SERVICES	40,000		402	Mar. '93		Products	8983	MBK	35,000		3300	June '93		Products
771	UNITED SHPG. SERVICES	40,000		403	Aug. '93		Products	8801	IDEMITSU KOSAN KK	258,000	Kawasaki	1436	Oct. '93		Crude
810	OANE-ANAPU	14,000		408	Feb. '93		Products	9027*	ORPHEUS TANKER CORP.	258,000		1439	July '94		Crude
806	CARCHI LIQUID SPA	14,000		409	May '93		Products	9036*	SEABULK	95,000	Koyo	2030	1st Qtr. '93		Crude
884	FLETAMENTOS MARTS.A.	40,000		410	Mid '94		Products	8829	JAPANESE INTERESTS	98,500	Kurushima	2734	1st Qtr. '93	NEPTUNE AURIGA	Crude
1985	FLETAMENTOS MARTS.A.	40,000		411	Mid '94		Products	8689	NEPTUNE ORIENT LINES	98,500		2735	Jan. '93	JIFRO SKY	Chemicals
DENMARK															
1711	TSCHUDI & EITZEN	76,300	B & W	942	Feb. '93	SIBOELF	O/B/O	9028*	Undisclosed	18,000		2766	May '93		Products
1939	TSCHUDI & EITZEN	80,000		944	April '93		O/B/O	8908	PERTAMINA	35,000		3290	Feb. '93		Crude
1949	NAESS JAFFE BLKRS INC.	80,000		945	Aug. '93		O/B/O	8909	PERTAMINA	35,000		3295	April '93		Crude
1993	TSCHUDI & EITZEN	80,000		946	Oct. '93		O/B/O	8910	PERTAMINA	35,000		3300	June '93		Crude
1994	TSCHUDI & EITZEN	80,000		947	Jan. '94		O/B/O	8796	MTSU O.S.K. LINES	39,400	Minami	622	Feb. '93	BRIGHT EXPRESS	Products
1567	A.P. MOLLER	288,000	Odense	141	Jan. '93	ELEO MAERSK	Crude	8943*	PROMISE SHIPPING	39,200		623	May '93	DYNAMIC EXPRESS	Products
1568	A.P. MOLLER	288,000		142	May '93		Crude	8658	AMOCO	280,000	Mitsubishi	2059	May '93	OCEAN GUARDIAN	Crude
1569	A.P. MOLLER	288,000		143	Sept. '93		Crude	8782	VELA INT. MARINE	280,000		2064	Sept. '93		Crude
1570	A.P. MOLLER	288,000		144	Dec. '93		Crude	8783	VELA INT. MARINE	280,000		2065	Nov. '93		Crude
1571	A.P. MOLLER	288,000		145	1st Half '95		Crude	8784	VELA INT. MARINE	280,000		2066	Feb. '94		Crude
1816	A.P. MOLLER	288,000		146	2nd Half '95		Crude	8850	SHINWA KALUN KAISHA	258,000		2071	Mar. '93	COSMOS DELPHINUS	Crude
								8864	TOKYO TANKER CO. LTD.	258,000		2072	June '93		Crude

TANKERS & COMBINED CARRIERS (CONTINUED)

No.	Owners	DWT	Yard No.	Delivery	Name	Type
JAPAN (cont.)						
9019	NIPPON YUSEN KAISHA	240,000		2076	June '94	Crude
8507	ENAR RASMUSSEN	147,900	Mitsui	1375	2nd Qtr. '93	Crude
8740	LONDON & OSEAS FRTR	150,000		1383	June '93	Crude
9032*	T & M MARITIME	107,000		1386	Jan. '93	Crude
9012	GOLDEN BELL MARITIME	258,100		1395	Dec. '93	Crude
8865	ENAR RASMUSSEN	80,000		1396	3rd Qtr. '94	Crude
8922	ENAR RASMUSSEN	80,000		1397	Nov. '93	Crude
8866	LEIF HOEGH & CO. A/S	103,700		1993	May '93	Cr./Prod.
8872	LEIF HOEGH & CO. A/S	103,700		1994	Jan. '94	Cr./Prod.
8706	SANKO KISEN KK	94,000	Namura	917	Jan. '93	Products
8907	MTSU O.S.K. LINES	67,000		920	Mar. '93	Crude
8867	SANKO KISEN KK	94,000		922	July '93	Crude
9020	NIPPON YUSEN KAISHA	94,000		924	Sept. '93	Crude
8975	SHINWA KAIUN KAISHA	69,000		925	Oct. '93	Crude
8990	MTSU O.S.K. LINES	147,000		926	Mar. '94	Crude
8605	BERGESEN D.Y. A/S	285,000	NKK	S 133	Mar. '93	Crude
8606	BERGESEN D.Y. A/S	285,000		S 134	Oct. '93	Crude
8964	SUNSHIP TANKER INC.	258,000		S 135	Mar. '93	Crude
8785	VELA INT. MARINE	280,000		S 137	Feb. '94	Crude
8786	VELA INT. MARINE	280,000		S 138	June '94	Crude
8787	VELA INT. MARINE	280,000		S 139	Nov. '94	Crude
9006	NIPPON YUSEN KAISHA	258,000		S 140	2nd Half '93	Crude
8878	PERTAMINA	17,500	Onomichi	367	April '93	Products
8658	MOWINKELS RED A/S	93,600	Sanoyasu	1114	April '93	Crude
8700	MOWINKELS RED A/S	93,600		1117	Sept. '94	Crude
8625	TEEKAY SHPG. (CAN) LTD.	280,000	Sasebo	S 385	Jan. '93	Crude
8750	H.K. MING WAH SHPG. CO.	276,000		S 386	June '93	Crude
8903	MTSU O.S.K. LINES	258,000		S 387	Dec. '93	Crude
8578	WILH. WILHELMSEN	280,000	Sumitomo	1179	Jan. '93	Crude
8626	BERGESEN D.Y. A/S	280,000		1183	April '94	Crude
8731	OLYMPIC MARITIME SA	280,000		1184	Mar. '93	Crude
8718	MOBIL OIL CORP.	280,000		1185	Nov. '93	Crude
9025*	OLYMPIC MARITIME SA	95,000		1191	Mar. '94	Crude

KOREA, SOUTH

8628	GOTAAS-LARSEN	300,000	Daewoo	5062	Jan. '93	Crude
8629	GOTAAS-LARSEN	300,000		5063	Jan. '93	Crude
8839	WORLD WIDE SHIPPING	280,000		5069	Mar. '93	Crude
8840	WORLD WIDE SHIPPING	280,000		5070	June '93	Crude
8894	WORLD WIDE SHIPPING	280,000		5071	June '93	Crude
8895	WORLD WIDE SHIPPING	280,000		5072	Aug. '93	Crude
8918	WORLD WIDE SHIPPING	280,000		5074	Oct. '93	Crude
8919	WORLD WIDE SHIPPING	280,000		5075	Dec. '93	Crude
9000	OE NATIONAL O. NAV.	280,000		5077	Jan. '94	Crude
8999	FIRST INT. CAPITAL GRP.	39,400	Haifa	179	Aug. '93	Products
8970	FIRST INT. CAPITAL GRP.	39,400		180	Oct. '93	Products
8971	FIRST INT. CAPITAL GRP.	39,400		197	Dec. '93	Products
8972	FIRST INT. CAPITAL GRP.	39,400		198	Feb. '94	Products
8991	FIRST INT. CAPITAL GRP.	39,400		199	Mar. '94	Products
8992	FIRST INT. CAPITAL GRP.	39,400		200	June '94	Products
8676	TEEKAY SHPG. (CAN) LTD.	105,000	Hyundai	743	Mar. '93	Cr./Prod.
8789	ELETSO CORPORATION	66,000		772	Jan. '93	Products
8830	ELETSO CORPORATION	66,000		773	April '93	Products
8881	PETROLEOS DE VENEZUELA	98,000		791	Jan. '93	Crude
8882	PETROLEOS DE VENEZUELA	98,000		792	Mar. '93	Crude
8883	PETROLEOS DE VENEZUELA	98,000		793	April '93	Crude
8884	PETROLEOS DE VENEZUELA	98,000		794	July '93	Crude
8885	PETROLEOS DE VENEZUELA	98,000		795	Sept. '93	Crude
8886	PETROLEOS DE VENEZUELA	98,000		796	Nov. '93	Crude
8889	PETROLEOS DE VENEZUELA	98,000		797	Jan. '94	Crude
8923	MARINE MANAGEMENT A/S	280,000		801	May '93	Crude
8900	S.G. LUNAROS	280,000		803	Aug. '93	Crude
8898	OVERSEAS SHIPPING GRP.	95,000		805	Nov. '93	Crude
8899	OVERSEAS SHIPPING GRP.	95,000		806	Feb. '94	Crude
9013	OVERSEAS SHIPPING GRP.	95,000		807	1st Qtr. '94	Crude
9014	OVERSEAS SHIPPING GRP.	95,000		808	2nd Qtr. '94	Crude
8962	CONSOLIDATED NAV.	280,000		810	July '93	Crude
8953	CONSOLIDATED NAV.	280,000		811	Sept. '94	Crude
9039*	VELA INT. MARINE	280,000		823	Mid '94	Crude
9040*	VELA INT. MARINE	280,000		824	3rd Qtr. '94	Crude
9041*	VELA INT. MARINE	280,000		825	4th Qtr. '94	Crude
8901	VELA INT. MARINE	280,000		841	July '94	Crude
9056*	VELA INT. MARINE	280,000		842	3rd Qtr. '94	Crude
9057*	VELA INT. MARINE	280,000		843	4th Qtr. '94	Crude
8659	DET NORDEN DIS	93,600	Samsung	1085	Jan. '93	Crude
8660	DET NORDEN DIS	93,600		1086	Feb. '93	Crude
8870	CONOCO INC.	93,600		1098	July '93	Crude
8871	CONOCO INC.	93,600		1099	Oct. '93	Crude
9007	BROKEN HILL PROP.	95,000		1100	Dec. '93	Crude

NORWAY

8848	J.O. ODFJELL	35,500	Kleven	250	Jan. '94	Chemicals
8849	J.O. ODFJELL	35,500		251	June '94	Chemicals
9038*	Undisclosed	18,600		253	Mid '93	Products
8958	STORU GROUP	35,500		258	Mar. '95	Chemicals
8959	STORU GROUP	35,500		259	Dec. '95	Chemicals
9024	EKTANK	18,000	Kristiansund		Sept. '93	Products

POLAND						
8292	NORSE MANAGEMENT	82,000	Gdynia	0563/02	May '93	Crude
8293	NORSE MANAGEMENT	82,000		0563/03	Oct. '93	Crude
PORTUGAL						
8706	SOPONATA	145,000	Solsnor	139	Mar. '93	Crude
ROMANIA						
7950	CZECH OCEAN SHPG.	85,000	Constantza	484	July '93	Crude
8831	PETROMAR	85,000		485	July '94	Crude
7998	PETROMIN SHPG. CO.	38,800	Galatz	799	1st Qtr. '93	Crude
8832	PETROMIN SHPG. CO.	38,800		814	June '93	Crude
8833	PETROMIN SHPG. CO.	38,800		815	Dec. '93	Crude
8834	PETROMIN SHPG. CO.	38,800		825	June '94	Crude
8835	PETROMIN SHPG. CO.	38,800		826	Dec. '94	Crude
8836	PETROMIN SHPG. CO.	38,800		827	June '95	Crude
8837	PETROMIN SHPG. CO.	38,800		828	Dec. '95	Crude
8905	CZECH OCEAN SHPG.	85,000	Mangalia	853	1st Qtr. '93	Crude
9034*	ARMINTER S.A.M.	16,000	Tulcea		Mid '94	Chemical
9033*	ARMINTER S.A.M.	16,000			1st Qtr. '94	Chemical

SINGAPORE

8914	SOFULMAR VAN OMMEREN	11,500	Sembawang	209	3rd Qtr. '93	Crude
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SPAIN

8762	MARINE MANAGEMENT A/S	75,000	Astano	267	Jan. '93	Crude
8759	KNUT KNUTSEN O.A.S.	123,000	Bilbao	288	June '93	Crude
8509	KNUT KNUTSEN O.A.S.	123,000		289	Dec. '93	Crude
8767	KNUT KNUTSEN O.A.S.	22,150		345	Jan. '93	Crude
8448	MARINE MANAGEMENT A/S	137,900	Puerto Real	57	Jan. '93	Crude
8472	EMPRESA NAC. ELCAÑO	137,900		60	Feb. '93	Crude
8473	EMPRESA NAC. ELCAÑO	137,900		61	Mar. '93	Crude
9053*	KNUT KNUTSEN O.A.S.	123,000		66	Mid '95	Crude
9054*	KNUT KNUTSEN O.A.S.	123,000		67	2nd Half '95	Crude
8846	KNUT KNUTSEN O.A.S.	22,150	Seville	282	July '93	Crude

TAIWAN

9021	CHINESE PET. CORP.	260,000	China S.B.	579	Feb. '95	Crude
9009	BERGSWANG SHIPPING	13,000	Ching Fu	006	4th Qtr. '93	Crude

TURKEY

8738	UM DENIZOLIK AS	160,000	Denizcik		1st Qtr. '95	Crude
8739	UM DENIZOLIK AS	160,000			3rd Qtr. '95	Crude

U.K.

8924	J.O. ODFJELL	35,500	Govan	305	Aug. '93	Chemical
8954	STORU GROUP	35,500		306	Dec. '93	Chemical
8955	STORU GROUP	35,500		307	Mar. '94	Chemical
8956	NATIONAL CHEM. CRS	35,500		308	June '94	Chemical
8957	STORU GROUP	35,500		309	Dec. '94	Chemical
7995	U.K. NAVY / RFA	32,900	H & W	1727	April '93	Fleet Rep.
8480	FRED OLSEN & CO.	133,000		1730	Feb. '93	Crude
8549	FRED OLSEN & CO.	133,000		1731	June '93	Crude
8550	FRED OLSEN & CO.	133,000		1732	2nd Qtr. '94	Crude
8284	U.K. NAVY / RFA	32,900	Swan Hunter	129	1st Qtr. '94	Fleet Rep.

U.S.A.

8378	U.S. NAVY / MSC	27,560	Avondale	2363	Dec. '93	Fleet Rep.
8377	U.S. NAVY / MSC	27,560		2364	Nov. '94	Fleet Rep.
8405	U.S. NAVY / MSC	27,560		2365	Feb. '93	Fleet Rep.
8406	U.S. NAVY / MSC	27,560		2366	June '94	Fleet Rep.
8407	U.S. NAVY / MSC	27,560		2367	April '95	Fleet Rep.
7902	U.S. NAVY / MSC	27,959	Tampa	001	1st Qtr. '93	Fleet Rep.
7903	U.S. NAVY / MSC	27,959		002	3rd Qtr. '93	Fleet Rep.

UKRAINE

9035*	INTER MARINE MGMT.	28,500	Admiralteisk		Dec. '93	Products
9049*	HASTINGS SHIPPING LTD.	28,500			3rd Qtr. '93	Products
9050*	MARYPORT SHIPPING INC.	28,500			4th Qtr. '93	Products
8936	ELETSO CORPORATION	68,000	Kerch	913	April '93	Products
8986	ELETSO CORPORATION	68,000		914	Oct. '93	Products
8987	ELETSO CORPORATION	68,000		915	April '94	Products
8753	FRAM SHPG. LTD.	28,400	Kherson	1422	Jan. '93	Products
8754	FRAM SHPG. LTD.	28,400		1423	June '93	Products
8755	TERKOLTANK	28,400		1424	3rd Qtr. '93	Products
8948	TERKOLTANK	28,400		1425	4th Qtr. '93	Products

TOTAL NUMBER OF SHIPS: 285

TOTAL DEADWEIGHT TONS: 30,977,968

* New entry.

Source: John I. Jacobs Pte

Risks And Rewards In The Tanker Market

Implications For Owners And Charterers

Risks and Rewards in the Tanker Market" is the latest survey to be published. The report demonstrates risks have risen through higher costs and poorer employment guarantees, and how the order of risks has moved from the market as a whole, to shipowners alone. It also plots the diminishing rewards observed by owners through letting out of their ships. In 1990-91, the Gulf crisis provided many shipowners with windfall profits. Yet by early 1992 freight rates had collapsed again and many vessels were failing to cover their running costs. As cost pressures continue to mount, the outlook remains highly uncertain. Consequently, the risks are increasingly falling on the owners alone, with few rewards in prospect.

It has not always been so. In the good old days charterers could offer owners long-term employment and were prepared to pay reasonable rates, even though the cost of freight was a greater proportion of the added cost of oil. And owners could improve profitability by regularly reducing costs through technological progress. This enabled fleet replacements and expansion to be readily financed.

However, the collapse in freight rates which followed the extraordinary peak seen in 1973, heralded a decline which has subsequently seen a restructuring of the market. Over the same period oil supplies have been increasingly sold under market-related formula prices with linkage to the spot market, and shipping needs have thus required more flexibility.

The major international oil com-

panies which once owned and controlled much of the world's tonnage, either through ownership or long-term charters, have become increasingly reliant on the spot market. However, the combination of rising oil prices and weak freight rates has meant that the freight element in the landed cost of oil has shrunk to historically low levels.

Obviously, in order to maximize revenues, it is in the shipowners' interest to operate vessels which are in the greatest demand but at the same time economical. In this way rewards should be maximized. The report shows the increasing cost of "quality" ships and examines whether or not those owners who are apparently being asked to provide ships of the highest quality are being rewarded for their efforts through premium rates.

There is a limit to the extent by which operating costs can be varied. Underlying operating costs are estimated to have risen by no less than 60 percent since 1988. And new-building costs have risen rapidly, while declining secondhand values have led to a risk of negative equity.

Independent shipowners cannot reconcile the risks of massive investment in new tonnage and few long-term contract opportunities with the insubstantial rewards currently being yielded by the market. If this situation persists, charterers might have to pay for their penny-pinching: eventually there will not be enough good ships for their needs.

For copies of this report contact:
Drewry Shipping Consultants Ltd.
11, Heron Quay, London E14 4JF.

LIQUID NATURAL GAS CARRIERS

(ON ORDER AS OF JANUARY 1, 1993)

Owners	Capacity M3	Shipyard	Delivery	Name
FRANCE				
PETRONAS	130,000	St. Nazaire	July '94	
PETRONAS	130,000	F. 30	Dec. '94	
PETRONAS	130,000	G. 30	Sept. '95	
PETRONAS	130,000	H. 30	Oct. '96	
PETRONAS	130,000	I. 30	July '97	
ITALY				
QATARGAS & SNAM*	65,000	Fincantieri	Dec. '95	
QATARGAS & SNAM*	65,000	5911	May '96	
JAPAN				
MARATHON & PHILLIPS	87,500	IH	June '93	POLAR EAGLE
MARATHON & PHILLIPS	87,500	3016	Dec. '93	
NYK / MOL / K-LINE etc.	125,000	Kawasaki	Mar. '93	LNG FLORA
ABU DHABI GAS	135,000	1438	Oct. '94	
MOSC. INT. LTD.*	19,100	1440	Feb. '96	
TOKYO GAS	135,000	Mitsubishi	June '94	
ABU DHABI GAS	135,000	2067	Mid '97	
AUSTRALIAN LNG	125,000	2074	Early '95	8th ship in series
SHELL TANKERS (UK)	125,000	Mitsui	Apr. '93	NORTHWEST SANDPIPER
ABU DHABI GAS	135,000	1390	Mid '94	
ABU DHABI GAS	135,000	1392	Mid '96	
NKK / MALAYSIAN SHPG.	18,800	NKK	July '93	
KOREA, SOUTH				
KOREA GAS CORP.*	130,000	Hanjin	Sept. '95	
HYUNDAI MARINE CO. LTD.	125,000	Hyundai	Mar. '94	
YUKONG LINE	125,000	761	Mar. '95	

TOTAL NUMBER OF SHIPS: 22
TOTAL CAPACITY: 2,422,900 CUBIC METERS

*New entry.
Source: John I. Jacobs Pte.

LIQUID PETROLEUM GAS CARRIERS

(ON ORDER AS OF JANUARY 1, 1993)

Owners	Capacity M3	Shipyard	Delivery	Name
BELGIAN				
HOLLING SHIPPING	12,000	Boelwerf	Dec. '93	
ITALY				
PETROL NAVI	21,000	Apulia	June '95	
SOC. GESTIONI NAVALI	10,500	M & B Benetti	1st Qtr. '93	EUROGAS QUARTA
SOC. GESTIONI NAVALI	10,500		2nd Qtr. '93	EUROGAS QUINTA
ITALIAN INTERESTS	11,800	Esercizio	Dec. '93	
UNIONE LIGURE	16,000		Mar. '93	
JAPAN				
KUMAMAI SENPAKU	75,000	Kawasaki	Feb. '93	OO-OP AKERON
NAVIX LINE	75,000		Mar. '93	MUSASHI GLORIA
KVAERNER	34,500		July '93	HEDDA
KVAERNER	34,500		Mar. '94	
KUMAY KOSAN	75,000		Mar. '94	
KOTC	76,000	Mitsubishi	Mar. '93	
KOTC	76,000		Sept. '93	
COSMO PETROLEUM GAS	78,000		June '93	ENERGY ORPHEUS
IDEMITSU	78,000		Jan. '93	
KOREA, SOUTH				
MELLITUS SHIPPING INC.	75,000	Hyundai	Mar. '93	
A.P. MOLLER	18,000		Mar. '93	
A.P. MOLLER	18,000		May '93	
A.P. MOLLER	18,000		June '93	
A.P. MOLLER	18,000		Aug. '93	
U.K.				
HAVTOR MGMT. A/S	56,000		Mar. '93	HAVIS

TOTAL NUMBER OF SHIPS: 21
TOTAL CAPACITY: 886,800 CUBIC METERS

*New entry.
Source: John I. Jacobs Pte.

Seaclear Industries Introduces New Heated Window System

Seaclear Industries, a company located in Edmonds, Wash., has recently announced a new addition to its line of high performance heated window systems to complement its product line.

Model HWSL is reported to be a lower cost, lower wattage system

intended for the operator who faces light icing, snow and condensation problems.

The company reports that the laminate easily installs over the inside of an existing window in about 15 minutes and plugs into any ordinary outlet.

The temperature is regulated by an electronically-controlled thermostat.

To resist scratching, the laminate has been hardcoated and reportedly will not fade or yellow with age.

Selby Develops Non-Skid Coating System For Use Onboard Ships

Selby, a division of Quaker Construction Products, has developed a state-of-the-art, high solids, low VOC epoxy non-skid coating system. The high performance system, SELBAskid, is applied over the revolutionary anti-corrosive marine primer SELBATITE.

It is a dual phase, high durability system designed to provide anti-skid protection over steel, aluminum, concrete and wood. SELBAskid is easily installed by roller and cures within 24 hours of application under normal conditions. SELBAskid can be used for exterior areas that are exposed to heavy traffic and harsh weather conditions. Typical uses include a variety of decks on marine vessels, offshore rigs, weather decks, flight decks and hangar decks, and loading/unloading areas.

Damen AluCat 1350 "Jacky" Built By Damen Shipyards In 15 Weeks



The Damen AluCat 1350 "Jacky".

Damen Shipyards of Gorinchem, Netherlands built the "Jacky," a vessel from the Damen AluCat 1350 series, in 15 weeks for her owner, Dredging Company Boskalis B.V. at Papendrecht in Holland, who will use her for hydrographic survey operations. Jacky is 45 feet long with a beam of 15 feet and a 3-foot draft. The all aluminum vessel can achieve speeds above 20 knots. The high speed enables the vessel to maneuver quickly in heavy traffic areas. The Atlas Deso echosounder fitted on board during trials functioned properly at both high and low speeds. The wheelhouse provides a clear view of both the survey desk and the helmsman position. The cargo well in the forward part of the vessel is made for carrying light equipment and for boarding of personnel. Platforms are placed on the top deck with foldable gratings for boarding high freeboard vessels.

Jacky Equipment List

Main engines	Caterpillar
Coatings	International Paint
Gearboxes	ZF
Waterjets	Hamilton
Engine controls	Kobelt
Bilge pump	Sihl
CO ₂ fire fighting system	Ajax de Boer
Ventilator engine room	Salor
Airconditioning	Carrier
Generator sets	Onan
Lighting	Aqua Signal
Liferaft	Viking
Compass	Plath
Radar	Furuno
VHF	Sailor
Depth Sounder	Lowrance
Echo Sounder	Atlas

New Westport Tour Boat Will Operate In National Park In Alaska

The latest model in Westport Shipyard, Inc.'s line of fast tour boats is the 90-foot x 22-foot "Kenai Explorer II." The Detroit Diesel powered, 27-knot boat was delivered to Kenai Coastal Tours in April 1993.

"I want to thank designer **Jack Sarin** and **Randy and Rick Rust**, who run Westport, for their responsiveness in incorporating the things we wanted into the vessel," said Captain **Edward Ward** of Kenai Coastal Tours. "Among improvements to a basic Westport vessel we wanted were more length, wider wheelhouse, and particularly a good turn of speed. The Detroit Diesel engines give us 27 knots and that means that we can take our passengers on a conducted tour of the Kenai Fjords in 5-1/2 hours as opposed to the usual eight hours."

100

The vessel's propulsion system employs two Detroit Diesel 16V92TA engines that develop 1,300 hp at 2,300 rpm. Engines drive 42X43, four-blade, Nibral propellers through DDC 332V 2.38:1 ratio reduction gears. Westport built the 16-inch wet exhaust and silencer system.

Controls involve MMC Micro Commander electronic propulsion systems and a Jastrum hydraulic steering system. Westport supplied its own foil-type, cast urethane rudders. A fairly extensive electrical system involves a 24-volt alternator on one engine and a 12-volt on the other; M-439D 36 kW Northern Lights generator; and M-843 12-kW Northern Lights generator. The electronics suite supplied by Northern Electronics encompasses Furuno 7040 radar, GP-70 GPS, LC90 MKII Ioran, and FCV-561/200 sounder; StephensSEA-UHF Standard Infinity VHF; ComNav 2001 autopilot; Aiphone four-station intercom; and ACR EPIRB and searchlight. **Jack Sarin**, Bainbridge Island, Wash., designed the



The Kenai Explorer II tour boat.

vessel based on an Airex PVC core fiberglass hull from a Monk-designed expandable mold.

For more information on Westport,

Circle 67 on Reader Service Card

J.M. Martinac Shipbuilding Completes Tug For Shaver Transportation

Shaver Transportation Company of Portland, Ore. recently took delivery of its new 3,000-hp ship assist tug Vancouver from J.M. Martinac Shipbuilding Corporation of Tacoma, Wash. The Vancouver will be an important addition to, and a significant upgrading of ship assist capability in the Port of Portland, and on the lower Columbia River. The new 12-knot tug was designed by Robert Allan Ltd. of Vancouver, B.C., Canada, and was based on the familiar Z-30 design developed by that firm for C.H. Cates & Sons Ltd. of North Vancouver.

The tug is powered by a pair of Detroit Diesel marine diesel engines driving a Z-drive rudder/propeller, Niigata Model ZP-2A, through a reduction gear and torsional coupling. The propulsion system was supplied by IMPEG of Vancouver, which represents Niigata Engineering Company Ltd. in Western Canada and the U.S. Northwest. The engines of the tug are mounted on Lo-Rez spring isolators, and the engine is connected to the gearbox through a Lo-Rez Type F/HF/8HLF flexible coupling.



The new ship assist tug M.V. Vancouver



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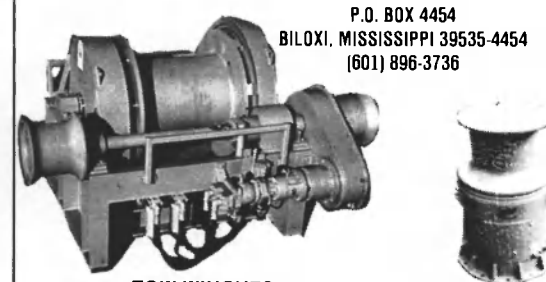
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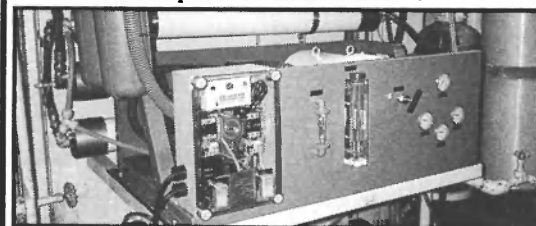


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O European Ferries cepts Delivery New Ferry

P&O European Ferries took delivery of the latest combi-ferry *Pride of Burgundy* from Schichau-Werke AG, Bremerhaven, Germany. The 588.5-foot ferry, originally named as a Ro/Ro-ferry, was converted into a combi-ferry as a consequence of the increased demand in capacity on the short-route Calais-ver.

Launched May 16, the ferry, which was named by its sponsor Mrs. Cherry Hambor, is capable of carrying 1,320 passengers, 120 trucks & trailers, and approximately 10 cars.

The vessel is powered by four 12-cylinder four-stroke diesel engines which drive a pair of stainless steel, air-blade variable pitch propellers. Propulsion is aided by a pair of 1,200 HP bow thrusters which help the ferry maintain a 21 knot service speed.

Comptek Awarded \$12.3 million Navy Contract

Comptek Federal Systems, Inc., a subsidiary of Comptek Research, Inc., has been awarded a contract by the U.S. Navy's Naval Surface Warfare Center, Dahlgren Division, valued at \$12.3 million.

Comptek will be the prime contractor for updating software for the LQ-32 Electronic Warfare System, which is installed on virtually all surface combatant ships in the U.S. Navy.

Comptek was the original software designer of the SLQ-32, and work on the contract will be performed by employees of Comptek in Goleta, Calif. and Dahlgren, Va.

Japanese Shipbuilders to Construct 77 Vessels

Japanese shipbuilders signed contracts to build 77 vessels with combined gross tonnage of 2,670,000 metric tons, according to the Japan Ship Exporters' Association. This latest total is 63% less tonnage than last year and the third lowest level in the past two decades.

The Association said that the continuing economic slump has been drastic enough to discourage ship owners from placing orders, especially for tankers, thus threatening that the much-needed replacement of aged VLCCs could be pushed even further into the future.

IMC Diversifies With New Commercial Operations Division

International Marine Carriers, Inc. (IMC), a leading ship management organization, recently announced its foray into commercial ship operations with the establishment of a new division.

William E. Peters, a 40-year

veteran in marine transportation and operations, has been named to head up the division as vice president of Commercial Operations. Mr. Peters' primary focus will be on the development of project cargo and international trade freight contracts, including spot, time and bareboat charters.

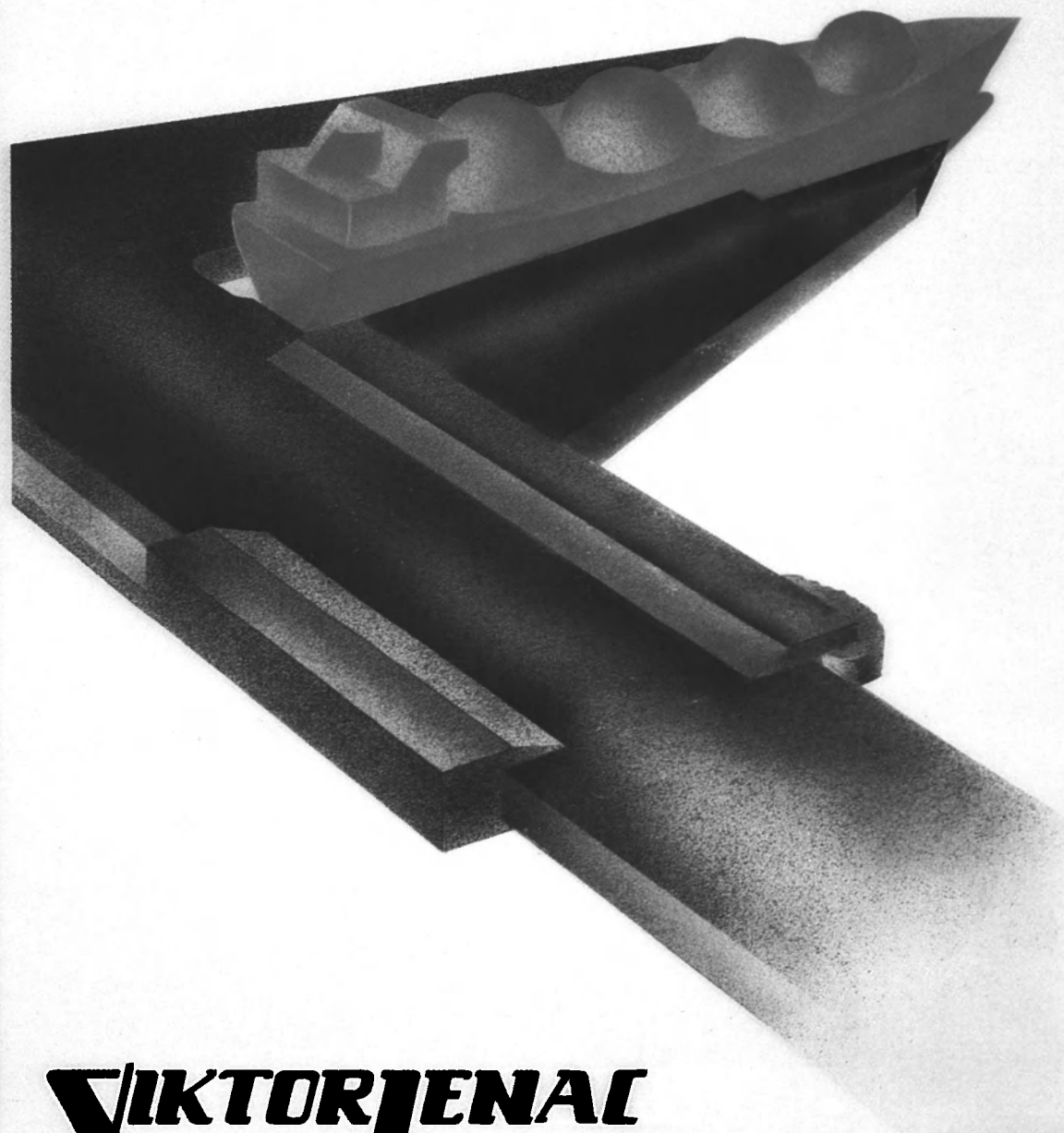
The announcement, made by IMC chairman, president and CEO **Robert Wellner**, comes at a time when the company is poised for expanded marine transportation opportunities

both domestically and abroad. "The increasingly receptive European common market and burgeoning Pacific Rim territories have opened up new channels for commercial shipping services," stated Mr. Wellner. "We intend to address these markets' needs with the same hands-on, high quality services as applied in our ship management. We're confident that **Bill Peters**, with his experience and network, will be a considerable asset both to our organization and this new client

base."

Prior to joining IMC, Mr. Peters directed his own commercial vessel operating, general agency and shipping consulting company, Telfair Marine Management Corp. in Wilton, Conn. He has also held executive positions with leading commerce and trading companies. They include a 16-year post as president of Golodetz Shipping and Chartering, Inc., New York, and a 17-year management position with the Alcoa Steamship Co., Inc., New York.

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NRC Announces Equipment Purchases

The National Response Corporation (NRC) announced equipment purchases which conclude the major part of its program for meeting OPA 90 requirements. The purchases include the following high capacity skimmers, containment systems and boom, storage barges and work platforms:

—15 Desmi DOP 250 Pumps

—37 High Capacity Vacuum Transfer Units
—12 28-ft. Kvichak Marine Boom Handling/Skimmer Support Boats
—15 Marco Belt Skimmers
—18 Vikoma Fastflo Skimmers
—12 Vikoma High Capacity, Adjustable Weir Skimmers
—1 50,000-ft. Oil Stop Inflatable Offshore Containment Boom
—1 100,000-ft. Containment Systems Nearshore Containment Boom
—17 Containment Systems Rope Mop Skimmers

—109 Flatbed and Box Trailers supplied by Island Equipment
—17 MEG Weir Disc Catamaran Skimmers

—58 40-foot x 8-foot x 4-foot Portable Barges

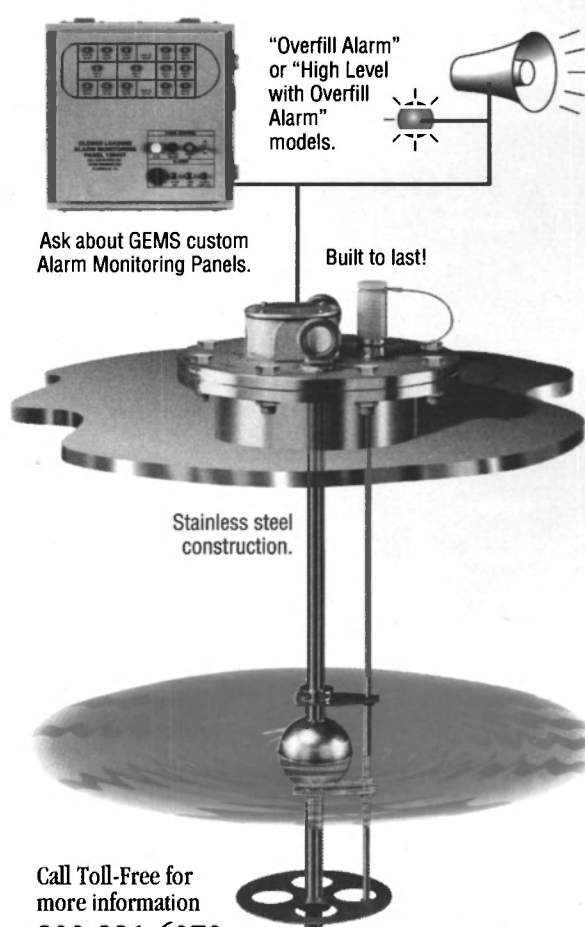
The Vikoma skimmers were purchased through Ocean Management Services of Gladstone, N.J., a distributor for the British-based manufacturer. The offshore containment boom supplier is Oil Stop, Inc., a subsidiary of W.R. Grace & Co. Of the 37 vacuum transfer units, 10 are

manufactured by FMT, Inc. Findlay, Ohio, and the remainder are manufactured by Guz Manufacturing, Inc. of Birmingham, Ala.

Mark Miller, president of NRC commented, "The completion of procurement program for equipment enables us to move forward toward OPA's August 18th deadline. expect deliveries to commence in 1990, with final delivery well before the OPA 90 target date."

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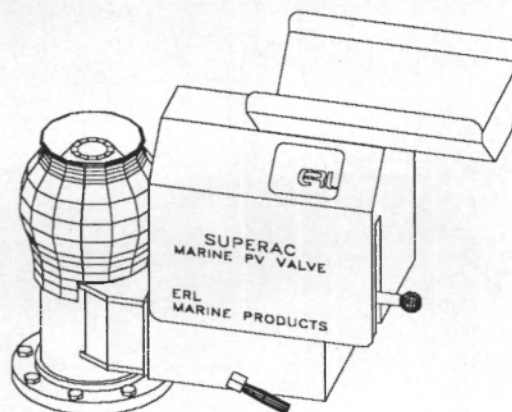
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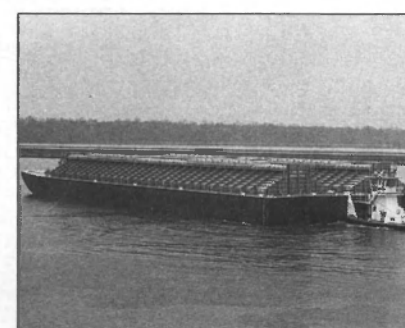
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Shearer & Assoc. Announce Delivery of Two Barges



Nashville Bridge Company built two 260-foot hopper barges.

Ed Shearer, president of Shearer & Assoc., Inc., announced that Nashville Bridge Company has delivered two 260 foot x 52 foot x 14 foot inland service covered hopper barges for use by Texasgulf, Inc., in moving products to and from the port of Morehead City, N.C.

Each barge has a capacity in excess of 3,100 short tons at 9.5-foot draft and will be used to carry bulk phosphate and other products for Texasgulf's Aurora, N.C. operation. The barges have integral ballast systems and are fitted with specially designed fiberglass covers from Syntech of Paducah, Ky. Although the barges are designed for inland service, the framing and extensive coating systems are suitable for operation in the salt water environment of the Atlantic Intracoastal Waterway.

Shearer & Assoc., Inc. developed the barge design after extensive analysis of Texasgulf's tonnage requirements, operating environments, cargo handling needs and barge strength and weight considerations. Shearer & Assoc., Inc. also provided full-time owner representation during construction of the barges and worked with Texasgulf's personnel subsequent to delivery.

Jurong Shipyard Wins Contract To Elongate Three Container Ships

Jurong Shipyard won a contract from Taiwan-based Evergreen Group to elongate three Panamax container vessels.

Maritime Reporter/Engineering News

The vessels are being built in Yamaguchi, Japan and will reportedly be delivered in March, July and September 1993. Following delivery each vessel, each will be sailed to Jurong Shipyard where a mid-section will be fitted increasing the tanker carrying capacity from 33 TEU to 4229 TEU. To date, Jurong Shipyard has carried out successful elongation works on more than 35 vessels.

Insurance Rates To Be Based On Tanker Age And Design

London underwriters reportedly have decided that pollution coverage rates for tankers carrying oil should be based on the tankers age and design features. The new rate structure will establish the insurance rates charged for the \$200 million of pollution coverage that may be purchased to supplement the \$100-million coverage provided by protection and indemnity clubs.

Under the new rate scheme, a single-hulled tanker that is over 25 years old and that trades in the U.S. will pay about 64 percent more per RT than a double-hulled tanker up to five years old.

For tankers older than 25 years, the corresponding figures are \$0.42 per GRT per voyage or \$2.85 per RT per year. Double-hull tankers built during or after 1987 will be eligible for a 15 percent reduction in the coverage rates, while double-bottom tankers will be given a 12.5 percent reduction. As a result, the oldest single-hull tankers trading in the U.S. will pay about 64 percent more for supplemental pollution coverage than new double-hull tankers of equal gross tonnage.

Japan To Fund Spill-Response Equipment For Southeast Asia

Japan has reportedly decided to provide six southeast Asian countries with approximately \$90 million for improving their spill-response capabilities. The Japanese government reportedly made the decision to provide the funds in the wake of the Maersk Navigator spill off Indonesia.

The countries receiving the aid - Brunei, Malaysia, Philippines, Singapore, Indonesia and Thailand - will reportedly use the money to purchase spill-response equipment and supplies they believe are most needed to fight pollution.

In a similar program, The Petroleum Association of Japan, in cooperation with Japan's Ministry of International Trade and Industry, is providing funding and technical assistance to private organizations in Southeast Asia to help them respond more efficiently and effectively to oil pollution.

Cospolich Refrigerator Co. Doubles Production Capacity To Offer Faster Service

Cospolich Refrigerator Co. of New Orleans, a designer and manufacturer of marine and institutional refrigerators, has more than doubled its production and warehouse space due to increased demand for the company's expanding line of refrigerators, custom refrigerator/freezer doors and quick chill cabinets.

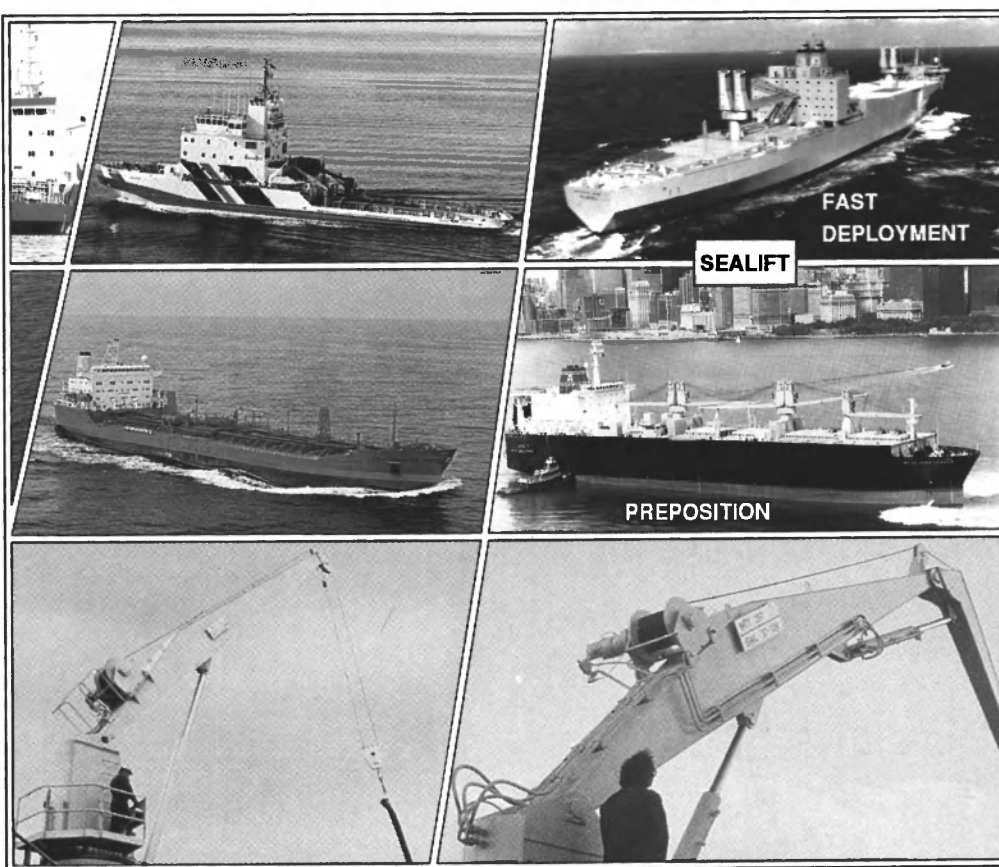
erators, custom refrigerator/freezer doors and quick chill cabinets.

Mark Whitfield, Cospolich president, said, "Once installed, Cospolich refrigerators are known for their trouble-free operation, durability and ease of maintenance. Another advantage is that the condensing unit is rail mounted in front of the unit, making maintenance, repairs or parts replacement quick and easy by ship's or galley personnel."

Cospolich was founded in New Orleans in 1937 and has experienced steady product and economic growth since then. The company builds and stocks a complete line of conventional refrigerators as well as modules for quick assembly and delivery.

For more information on Cospolich Refrigerator Co.,

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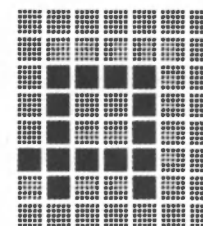
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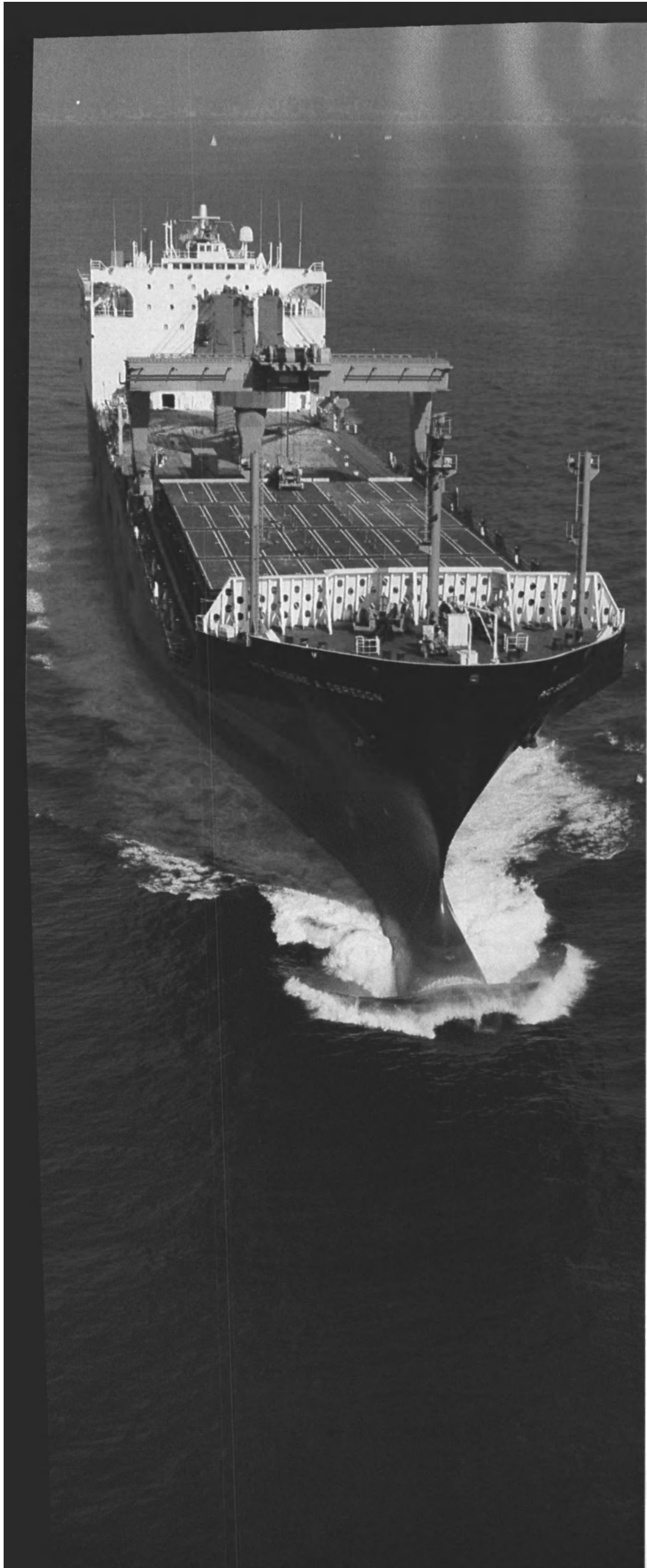
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DEFENSE CONVERSION

*Shipbuilders and Ship Machinery
Manufacturers To Benefit*

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

The Defense Conversion, Reinvestment, and Transition Assistance Act of 1992 provides a framework for assisting defense contractors in transitioning from military to commercial activity. To implement the Act, \$575 million was included in the 1993 defense appropriations to support defense conversion programs. Included in the budget is \$15 million to support applied research and development for commercial shipbuilding. This represents the kick-off of a National Shipbuilding Initiative which is ultimately projected to provide funding of \$2.2 billion over the next eight years.

Role of ARPA

Responsibility for coordinating programs under the Defense Conversion Act has been given to the Advanced Research Projects Agency (ARPA). This agency, created in 1958, functions as the central research & development (R&D) office in the Department of Defense (DOD). Its creation was motivated by the Russian launching of Sputnik. ARPA's task until recently has been to ensure that the U.S. stayed in front of the technology race for developing new military systems. This task has now been broadened to include assisting defense

firms in converting to commercial activities in order to ensure the continued availability for future military requirements. Until recently, ARPA has been known as the Defense Advanced Research Projects Agency. Reflecting its changed role, Defense was dropped from the agency's name in March of this year - and the organization reverted to the original name which it held through 1972.

ARPA is a small agency with a total staff of about 190. This small staff administers an R&D budget of \$2.4 billion in fiscal 1993. ARPA utilizes the professional capabilities of the Army, Navy, Air Force, NASA, DOE and other government agencies to evaluate and manage specific projects. Proposals sent to ARPA are distributed to appropriate individuals within other government agencies for review and evaluation. Contracts may be awarded directly by ARPA, or through the contracting offices of other government agencies.

Technology Reinvestment Project

In mid-March of 1993, ARPA announced the implementation of the Technology Reinvestment Project. This project is to be the vehicle for channeling government funds to U.S. companies for defense conversion activities. Nine programs have been grouped under the Tech-

1993 Funding For Technology Reinvestment Project	
Purpose	(millions of \$)
Defense dual use critical technology partnerships	\$81.9
Commercial-military integration partnerships	42.1
Regional technology alliances assistance program	90.5
Defense advanced manufacturing technology partnerships	23.5
Manufacturing extension programs	87.4
Defense dual use assistance extension program	90.8
Manufacturing engineering education grant program	43.6
Manufacturing experts in the classroom	4.6
Small business innovative research program	7.2

gy Reinvestment Project and 2 million has been earmarked under the government's share anticipated activities in fiscal year 3.

RPA issued an industry solicitation in mid-May, inviting interested firms to submit proposals for sharing activities.

Proposals are to be submitted by 23, 1993.

These proposals will be sent to various government agencies for review and evaluation. Selected contractors will be notified prior to the 1 of September 1993 so that contracts can be placed in this fiscal year.

Cost Sharing Required

Successful bidders will be required to cost share the R&D activities. All programs have cost sharing requirements of at least 50 percent. This cost sharing can be in a variety of forms:

—In-kind contributions may include matching funds from non-DOD sources, if statutes permit.

—IR&D may be included if using cooperative agreement or other transaction; and, if proposal would have been allowed as contractor R&D had there been no cooperative agreement or other transaction.

—The cost of technology transfer may be included subject to mutually agreed evaluation during contract negotiation.

—In-kind value of equipment and software may either be the purchase cost or the depreciation during the period of contribution. Depreciation method shall be the method used internally by the contributing organization.

The value shall be prorated according to the share of its total use on the proposed project.

—In-kind contribution of space shall not exceed the fair rental value and shall be prorated according to the share of its total use on the proposed project.

—Profits and fees on government contracts may be included as cash contributions.

Shipbuilding Technology Focus

Eleven technology areas have been identified by ARPA as most critical for meeting defense needs and having greatest potential for commercial product development. Shipbuilding has been identified as one of these areas. According to ARPA:

"While the international shipbuilding industry is booming, the nation's shipbuilding industry is on the verge of collapse. The U.S. shipbuilding industry has been assisted by large DOD shipbuilding efforts for many years. Current and projected Navy combatant/auxiliary ship construction is insufficient to maintain the industrial shipbuilding capacity required for mobilization. This effort is intended to assist the U.S. shipyards and related industries to become competitive in international commercial markets and thereby preserve a viable shipbuilding infrastructure for defense. The effort will address innovative ship design and construction pro-

cesses and ship systems technologies such as propulsion and auxiliary systems."

It is expected that a number of U.S. shipyards and marine machinery manufacturers will submit proposals to ARPA for funding under this program."

Long Term Plan For Shipbuilding Support

According to an action plan pre-

sented at an industry-sponsored conference, funding totalling \$185 million is projected to be available for shipbuilding initiatives over the next two years.

The level of funding is to rise to \$300 million in 1995 and \$400 million annually between 1996 and 1999.

This plan is, of course, subject to budget constraints and future spending priorities.


Among ideas under consideration

is creation of a National Maritime Center.

The purpose of this center would be to "wire together shipyard and vendors" in an effort to jointly develop new technology and share breakthroughs.


The goal of the National Shipbuilding Initiative is to ultimately enable U.S. shipbuilders to capture ten percent of the world shipbuilding market and create 250,000 new jobs.

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Kvaerner Masa-Yards Installs CAD System From Computervision Corp.

Finland's largest shipbuilder, Kvaerner Masa-Yards, Inc., of the Norwegian Kvaerner Group, is installing a new \$1.1 million computer-aided design (CAD) system provided by Computervision Corporation of Bedford, Mass.

The basic software, called Medusa, will be adapted for shipbuilding design, and Kvaerner expects to market the resulting shipbuilding CAD program to other shipbuilders.

Kobelt's Satellite Controller Permits Remote Steering

Kobelt Manufacturing Co. Ltd., Richmond, B.C., has introduced a

new remote steering controller which allows a captain to steer his vessel from anywhere on board.

Kobelt's Satellite Controller model #7168 is an electrical unit which hooks up to the ship's hydraulic steering system. Throttle levers control one or two main engines. A rotary dial directing rudder position and bowthruster controls can be integrated into the unit. The device can also be equipped with indicator lights, push buttons or toggle

switches to select various precision or steering modes.

The Satellite Controller is lightweight and easily portable. A shoulder strap allows it to be worn comfortably around the neck like a camera. Constructed entirely of brass and stainless steel, the unit is reported to be totally sealed to prevent damaging moisture from entering.

Caird & Rayner Clark Offers Flash Evaporators For Cruise Ships

Caird & Rayner Clark Ltd., England has designed and manufactured desalination systems over 100 years. The company offers the complete freshwater package required for a modern cruise ship comprising multi-stage flash and reverse osmosis desalination units together with water treatment equipment for neutralization, mineralization and sterilization.

The fresh water generators offered by the company have been installed on two new cruise ships built at Chantiers de l'Atlantique Saint Nazaire, France, for Kloster Cruise Limited. Each ship is fitted with two, 280-ton/day, six-stage flash evaporators and one, 150-ton/day triple effect evaporator, all utilizing engine jacket cooling water as the main source of heat, boosted by steam to compensate for low-load conditions of the engines.

Effer Offers New Range Of Marine Cranes

Effer Cranes Marine Division, a major producer of marine cranes has introduced a new range of stiffboom marine cranes.

The new cranes will have lifting capacities from 20 tons up to 500 tons, with a maximum outreach of 52.5 feet. The cranes can be built to meet the most extensive requirements of the customer at a price which is reported to be substantially lower than the knuckleboom crane range.

Murphy Oil Acquires Interest In Oil Project

Murphy Oil Corporation has announced that its Canadian subsidiary, Murphy Atlantic Offshore Oil Company Ltd., has completed the previously announced acquisition of a 6.5 percent interest in the Hibernia Oil Development Project, offshore Newfoundland.

Recoverable reserves from the field are estimated to be in excess of half a billion barrels of oil, with first production planned for mid-1997 and peak production of 125,000 barrels per day in 1999. The estimated share of remaining development costs for the company's interest is \$226.6 million, and the transaction includes a financial package offered by the government consisting of guaranteed loans and grants.

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Mitsui Develops Engine For Manned Submersibles

Mitsui Engineering and Shipbuilding Co., in conjunction with the University of Tokyo's Institute of Industrial Science, has developed a diesel engine system which reportedly allows robotic submersible to operate under water for a maximum of 24 hours.

Electric Motors To Power Conoco's Newest Tanker

Conoco's newest double-hull tanker, to be delivered to the company's Norwegian affiliate in 1995 from Samsung Shipbuilding and Heavy Industries of Korea, will be one of three crude oil tankers in the world to be powered by electric motors. Reportedly four diesel-powered electric generators will power a pair of 15,000-hp electric motors to drive the ship's propeller.

Tracor Gets \$36.7-Million, Five-Year Navy Contract

Tracor Inc. announced its Tracor Applied Sciences Inc. subsidiary received a five year contract, including options, with a total value of \$36.7 million to provide engineering and technical services to the naval Electronic Systems Engineering Activity operation in Ingleside, Md. The services will be in support of shipboard and shore-based "Identification Friend or Foe" systems and programs.

Unisys Unit Gets Three \$500,000 Navy Pacts

Paramax, a unit of Unisys Corp., received three \$500,000 contracts from the U.S. Space and Naval Warfare Systems Command for the Navy's Next Generation Computer Resources Program. The three fixed-price contracts total \$1.5 million, according to the company, and each contains options which bring the potential value of the relationship to between \$15 and \$39 million over the next five years.

Station Casino Has Preliminary Approval For Riverfront Project

Station Casino announced it received a permit from the Army Corps of Engineers which grants preliminary approval for construction of a riverboat dock as part of the company's proposed 52-acre St. Charles Riverfront Station project. The St. Charles project consists of a 387-foot riverboat with 24,000-sq.-ft. of casino space, and a capacity for 2,100 passengers. In addition, the company intends to develop a 90,000-sq.-ft. food and entertainment barge. The St. Charles Station is expected to open in late 1993 or early 1994, at a cost of \$50 mil-

lion. Long term plans for the Missouri River complex include the addition of up to three more riverboats.

Mitsubishi, Skaarup Study Debates U.S.'s Tanker Design Mandates

Tanker design provisions mandated by the U.S. may increase the

potential for environmental damage from major oil spills, a study dubbed "Tanker Design for Pollution Prevention" contends.

The study, prepared jointly by Mitsubishi Heavy Industries and Skaarup Oil Corp., declared that a mid-deck tanker would be at least as effective in some circumstances, and "definitely more effective" in preventing environmental damage than the Congressionally-mandated double-hull design.

The report also urges Congress to reconsider its position excluding all tanker designs except double-hull, in the face of overwhelming technical evidence from around the world that other designs may be equivalent or better.

For a complete copy of the recently released report from Mitsubishi,

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June, 1993

End Of Subsidies May Push APL To Foreign Flag

The decision by the Clinton Administration to end operating subsidies to U.S. ship companies by 1997 may cause Oakland, Calif.-based shipping company American President Lines to reflag. APL, which reportedly received more than \$69 million in operating subsidies last year, depends on the funds to offset

the costs of remaining a U.S.-flag carrier, including higher crew costs and taxes.

Offshore Systems To Outfit Bulk Carriers With ECPINS

Offshore Systems International (OSI) of Vancouver, B.C. and Seattle, Wash. concluded a deal for outfitting 11 bulkcarriers of Canada Steamship Lines (CSL) with

ECPINS (Electronic Chart/Precise Integrated Navigation System). The Montreal-based shipowner has an option to buy 20 additional ECPINS systems within a year. CSL reportedly owns the largest fleet of belt self-unloading bulkcarriers in the world. CSL operates vessels in the Great Lakes, the St. Lawrence Seaway, the U.S. coasts and worldwide. The commercial benefit of maintaining on-time deliveries to CSL's customers is very

significant. After evaluating competitive systems for this new ECD, CSL decided to buy OSI's ECPIN because it offers more advanced features, including an Anti-Grounding alarm. **Jim Andrews**, CSL's vice president of fleet management, stated, "I think OSI is on the leading edge of the technology as it exists today, and we are going to work with them to maximize the benefits of this powerful navigational aid." The contract calls for installing on the bridge of the self-unloaders an ECPINS console with 21-inch color display, integrated GPS and Differential GPS (DGPS) receivers and a remote display with independent operator controls. For more information on Offshore Systems Intl.,

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SeaArk Delivers Vessel To Corp of Engineers

The U.S. Army Corps of Engineers Cape Cod Canal Station, recently took delivery of a new 40-foot aluminum Patrol Boat, named Cataume and built by SeaArk Marine of Monticello, Ark. The vessel will be used to patrol the canal and the Buzzard's Bay approach channel.

Sperry Introduces RASCAR Clutter Reduction

Sperry Marine of Charlottesville, Va. has introduced a new clutter-reduction feature for its family of RASCAR Radar/ARPA's. The new device, dubbed Superscan, is now standard on all new Sperry Marine RASCAR systems and is available in kit form for upgrading existing systems. For more information on the new Sperry product,

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Schat Watercraft Appoints W.B. Arnold Co. As East Coast Reps

Schat Watercraft Inc. has appointed W.B. Arnold Co., Inc. of West Caldwell, N.J. as its East Coast representative for its full line of life saving and deck equipment. The Schat Watercraft Service Center in New Iberia, La. provides a full spare parts and after sales service to support all craft and davit installations. For more information on Schat Watercraft Products,

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MWB Refits Seismic Survey Ship

The MWB Motorenwerk Bremerhaven GmbH recently completed a major refit of the Panama-registered seismic survey ship the MV "Mintrop" in just 33 days. MWB, which has refitted and modernized more than 40 seismic ships, fitted

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ship, which is owned by the diverger-based Geco A/S, with a 10-ton, prefabricated, stronger helicopter pad. In addition, the entire computer room, along with recording and checking equipment, was renewed, and a complete overhaul was carried out on the engine room. The two original MAK type 6M 551 four-stroke engines were fitted with new mountings to cut vibration and noise. Also, a new Escher-Wyss variable pitch propeller and Kort nozzle were provided.

Tenmat's Feroform Bearings Pass Pressure Test

Tenmat Ltd. of Trafford Park, Manchester recently had inquiries from Germany and Australia for bearing material for use on submarines, where the bearings would be subjected to external sea water pressures at varying and very considerable depths. As tests on submarines in use, to check for swelling of material, was not practical, Tenmat was able to use the Isostatic press at its ceramics Division at Rugby to simulate the pressure. Following a series of tests in which Feroform T 12 and T 14 bushes in metal housings were subjected to pressures of 1,000-, 2,000- and 4,000-psi for a length of four days, the company reports the materials performed well and both customers were pleased.

For more information on Tenmat,

Circle 92 on Reader Service Card

Comsat Moves Offices to Maryland

Comsat recently announced the new address and phone numbers for its corporate offices, which were moved as of June 1st. Comsat Corporation, Video Enterprises, International Ventures and World Systems can now be reached at: 6560 Rock Spring Drive, Bethesda, Md. 20817, tel: (301) 214-3000. Comsat Maritime Services, as well as the divisions including: General Corp., Technology Services, Laboratories, Aeronautical Services, Mobile Communications and Land Mobile and Special Services, can be reached at: 22300 Comsat Drive, Clarksburg, Md. 20871, tel: (301) 428-4000.

REL Inc. Distributes SpilCAT Products

Reduced Environmental Liability, Inc. (REL), a New Jersey-based company, distributes SpilCAT products. SpilCAT, which takes its name from the abbreviation C.A.T. (Capillary Absorbent Technology), is non-hazardous, non-toxic, biodegradable, hydrophobic, non-flammable and absorbs 60 times its weight. It is used for containing, absorbing and disposing of spills, effectively minimizing cost and environmental impact. For more information on SpilCAT from REL Inc.,

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June, 1993

Meyer Werft Delivers Passenger Ship "Ciremai"

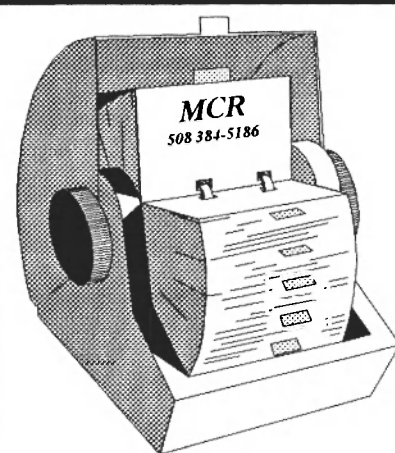
In May, Meyer Werft of Germany delivered the 11th passenger ship to the Directorate General of Sea Communication, Jakarta, Indonesia.

The vessel, named Ciremai, is the first in a series of five passenger ships for the Republic of Indonesia comprising two 14,000-gt units and

three 6,000-gt units. Upon completion of this series in the autumn of 1994 the yard will have built a total of 21 ships (15 passenger ships, five cargo/passenger ships and one gas tanker) for Indonesia. The Ciremai is 479 feet long, with a breadth of 76 feet and a draft of 19 feet. The ship is divided into four fire zones. A smoke and fire-detecting system is installed in the machinery spaces, cargo holds and air conditioning

rooms. The Ciremai is installed with a monitoring system by Siemens. The system is based on the Simatic S5 and consists of a central station and two self-sufficient substations in the engine room.

The ship is propelled by a twin engine plant, MaK 4-stroke diesels, with Renke Tacke reduction gear and Lips controllable pitch propellers. Each engine has an output of 6,400 kW (8,700 hp) at 428 rpm.



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Renk Tacke To Supply New Gear Units For Finnjet Superferry

Renk Tacke GmbH received an order for the delivery of a new gear unit system for the Finnjet by the Finnish shipping company group Effjohn Oy AB.

The CODELAG gear unit system (Combined Diesel-Electric and gas turbine) can be run diesel electri-

cally, only with gas turbine in combined operation according to the vessel's speed. To minimize fuel consumption, the most favorable propeller speed is achieved using three different gear unit ratios.

The Finnjet is a gas turbine propelled vessel which runs between Travemunde and Helsinki year-round and has a maximum speed of 30 knots.

The gear units will be delivered in April 1994 after a design period of

only 13 months. The exchange of the gear unit system must be completed within a basic overhaul of 14 days.

Bollinger Names Executive Appointments

Bollinger Machine Shop & Shipyard, Inc., long recognized as a ma-

jor southern repair facility for li-haul towboats as well as area gulf shore vessels, has named **Tillman Esteve** as vice president and general manager of Bollinger Quick Repair, Inc.

Established in 1947, Avond, Harvey Quick Repair was bought Bollinger Machine Shop & Shipyard, Inc. in March of this year.

The company also announced the **Mark Detillier** has been named the new vice president and general manager of the Larose Division, and **Paul Bailleaux** has been named yard superintendent of that facility. Finally, **Stephen Walker** has been named program manager of the Fiberglass Division.

The current fiberglass program is focused on a contract to build 133-foot rigid hull inflatable boats for the U.S. Navy.

For more information on the capabilities of Bollinger Machine Shop & Shipyard,

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ECPINS intelligently combines information from a variety of navigational sensors (GPS/DGPS, gyro, log, depth sounder, etc.) and displays "own-ship" position with great clarity on an authorized electronic vector chart. Navigational radar data plus ARPA data from existing bridge radar can be superimposed on the electronic chart display.



ECPINS projects an Anti-Grounding Sector ahead of the ship. When the operator inputs a safe depth, both visual and audible alarms will sound in case of shallow waters, or if "above water" chart features, such as rocks, land, piers, etc. are within the sector.

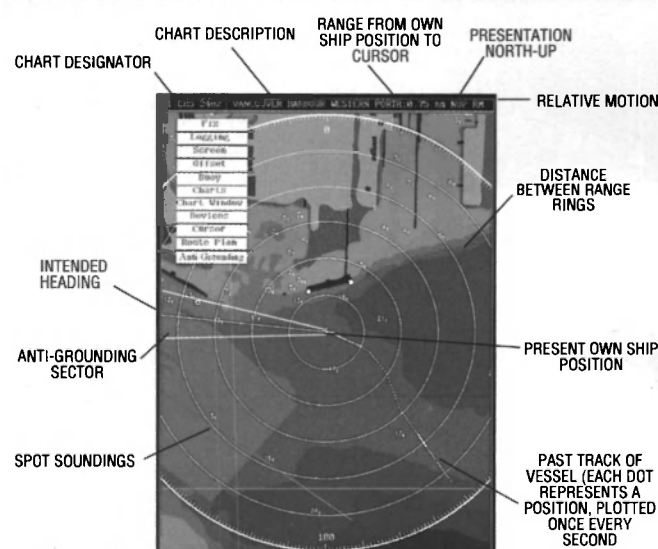
Chart data can be viewed on multiple non-overlapping windows at different range scales and presentation modes. All vital navigation data are summarized in a NAV display window. The system is easily operated via trackball cursor and built-in keypad. A 24-hour log is kept showing all vital sensor data.

ECPINS complies with all IMO performance standards for ECDIS. The result of over 10 years of research, ECPINS is used by shipping companies, ferries, and the U.S. & Canadian Coast Guard and Navy.



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HDW Acquires 55,000-Ton Floating Dock

Howaldtswerke Deutsche Werf A.G. (HDW) of Kiel announced that it has acquired a 55,000-ton floating dock from Cityvarvet, Gothenburg. The floating dock will be ready for service at HDW's Kiel Shipyard early next month.

The acquisition of the drydock was prompted by HDW's decision to improve and modernize its capacity for repairs and conversions of all types and sizes of ships.

HDW's new dock is 991 feet long and 180 feet wide.

HDW's four graving docks include one dock of 1,398 x 289 x 28 feet which, while mainly used for newbuilding, is also available at times for major repairs and large conversions.

For more information on HDW,

Circle 69 on Reader Service Card

Kvaerner Receives U.K. Naval Order Worth \$12 Million

Kvaerner A/S, a Norwegian engineering, shipping and offshore group, recently announced that its Kvaerner Govan unit of the U.K. will receive \$12 million to build a helicopter carrier for the British Royal Navy in a joint project with Vickers Shipbuilding Engineering Ltd. (VSE).

The new vessel will measure 656 feet, weigh 20,000 gt and will be classed as a landing platform helicopter carrier.

Kvaerner Govan will build the vessel to normal specifications, while VSE will supply and install all military equipment.

Maritime Reporter/Engineering News

it Megayacht Captain urse Completed

The first in a new series of simulator courses designed for captains of yachts measuring more than 70 feet was completed in Newport, R.I. The three-day course was signed by a team of experienced yacht captains in conjunction with MarineSafety International's professional training staff. MarineSafety (MSI), a subsidiary of YachtSafety International, has been conducting simulator-based handling training for the U.S. Navy and commercial clients at Newport for the past six years.

The YachtSafety™ course was developed for professional superyacht captains at the urging of yacht owners, management companies, insurance underwriters, yacht brokers and yacht builders. Many of these individuals were already familiar with FlightSafety International, a professional training organization for aircraft pilots.

For more information on MarineSafety International,

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Classification Societies Form New Group

Under the terms of an agreement signed in Paris on April 27, 1993, three international Classification Societies, Germanischer Lloyd (GL) (Germany), Registro Italiano Navale (RINA) (Italy) and Bureau Veritas (BV) (France) have established a European Economic Interest Grouping (E.E.I.G.).

With the establishment of this E.E.I.G., the Societies intend to enhance cooperation, particularly in the areas of research & development, classification rules, quality assurance procedures, surveyor training, and optimization of their worldwide representation.

E.E.I.G. Unitas has been chosen as the name of this grouping to symbolize the desire of all three members to combine their strength and assets and, more specifically, the technical and scientific resources needed to enhance their capacity within the international maritime community.

Each classification society will retain its own operational structures within this grouping, as well as its name and identity.

Magnum Boats Adopts Workskiff As Name Of Company And Boats

Magnum Boats of Bothell, Wash., which builds aluminum skiffs popular for use in severe environments, has adopted the name "Workskiff" for the company and its line of boats.

President **George Lundgren**, who said he originally picked "Magnum" because he designed the aluminum craft to be the "optimum" work skiff, pointed out there were a

number of companies in the market using "Magnum" both for products and name of firms and divisions.

"Fortunately, our boats have proven very popular; but as we sold over a wider area than our native Pacific Northwest, the name led to some confusion with several other boat lines and marine gear that carry the "Magnum" title," Mr. Lundgren said. "We considered several hundred names before deciding that the name should be plain, straightforward, and strong,

just as we designed the boats. "Workskiff" seemed to say it all."

Mr. Lundgren said, however, that the boats appear increasingly attractive to sportsmen who want a particularly rugged boat, and that Workskiff would more than likely pick an additional name that reflects recreational use of the boats.

At the same time, Mr. Lundgren said that his order book has forced doubling of his manufacturing space in Bothell. Mr. Lundgren will shortly release details of a new 23-

foot boat, a model for which he already has orders, he said.

Mr. Lundgren describes the 16- and 19-foot skiffs he developed as similar to "pickup trucks." He builds them to a standard design and customers can add equipment or features as needed. The heavy aluminum, monocoque-type skiffs have foam filled double bottoms. They are reportedly not only unsinkable, but are incredibly tough. The skiffs are so tough that Workskiff offers a lifetime warranty.

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(SHORT TONS, 000s OMITTED)

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Rank	Port	Volume	Rank	Port	Volume	Rank	Port	Volume
1	Houston (TX)	41,068	1	Hampton Roads (VA)	63,614	1	Hampton Roads (VA)	71,956
2	New York/New Jersey	38,431	2	Gramercy (LA)	39,731	2	Houston (TX)	67,560
3	Corpus Christi (TX)	30,345	3	New Orleans (LA)	29,727	3	Gramercy (LA)	61,172
4	Philadelphia (PA)	22,807	4	Houston (TX)	26,492	4	New Orleans (LA)	47,584
5	Gramercy (LA)	21,441	5	Baton Rouge (LA)	16,587	5	New York/New Jersey	46,238
6	Texas City (TX)	20,891	6	Long Beach (CA)	15,246	6	Baton Rouge (LA)	36,474
7	Baton Rouge (LA)	19,887	7	Tampa (FL)	14,631	7	Corpus Christi (TX)	36,159
8	Lake Charles (LA)	18,703	8	Baltimore (MD)	14,501	8	Long Beach (CA)	26,122
9	New Orleans (LA)	17,857	9	Portland (OR)	13,823	9	Los Angeles (CA)	25,231
10	Port Arthur (TX)	17,536	10	Mobile (AL)	13,582	10	Lake Charles (LA)	24,605
11	Pascagoula (MS)	16,894	11	St. Rose (LA)	12,783	11	Philadelphia (PA)	24,053
12	Los Angeles (CA)	13,097	12	Los Angeles (CA)	12,134	12	Baltimore (MD)	23,913
13	Paulsboro (NJ)	12,746	13	Tacoma (WA)	9,627	13	Texas City (TX)	23,547
14	Christiansted (VI)	11,549	14	Destrehan (LA)	9,490	14	Mobile (AL)	20,619
15	Long Beach (CA)	10,876	15	Seattle (WA)	8,483	15	Port Arthur (TX)	20,503
16	Baltimore (MD)	9,412	16	New York/New Jersey	7,807	16	Tampa (FL)	20,335
17	Boston (MA)	8,767	17	Charleston (SC)	5,937	17	Pascagoula (MS)	20,285
18	Chester (PA)	8,473	18	Savannah (GA)	5,906	18	Portland (OR)	16,773
19	Hampton Roads (VA)	8,342	19	Lake Charles (LA)	5,902	19	St. Rose (LA)	14,727
20	Mobile (AL)	7,037	20	Corpus Christi (TX)	5,614	20	Seattle (WA)	14,608
21	Freeport (TX)	6,519	21	Anchorage (AK)	5,516	21	Tacoma (WA)	14,522
22	Seattle (WA)	6,125	22	Duluth/Superior (MN/WI)	5,473	22	Paulsboro (NJ)	12,932
23	Portland (ME)	6,038	23	Toledo (OH)	5,333	23	Christiansted (VI)	12,666
24	Tampa (FL)	5,704	24	Kalama (WA)	5,284	24	Savannah (GA)	10,822
25	Wilmington (DE)	5,578	25	Longview (WA)	4,775	25	Destrehan (LA)	9,575

Note: Rankings are based on waterborne foreign commerce and do not include cargo moved domestically between U.S. ports
Source: U.S. Bureau of the Census

Plastic Shrink Wrap Reduces Waste At Southwest Marine



Closures of polyethylene fire-retardant heat shrink wrap capture particulates and reduce cleanup requirements at Southwest Marine, Inc., San Diego.

Creative use of plastic shrink wrap has increased productivity and, at the same time, enhanced air and water quality at major San Diego ship yards, operators say.

It was in 1989 when a ship yard subcontractor noticed a pleasure boat that was encapsulated in polyethylene fire-retardant heat shrink film.

The boat was at the time being towed at interstate highway speeds, and using the shrink wrap it was fully protected from weather.

The subcontractor, Ronald W. Little of West Coast Coating Corp., suggested major ship components and specially constructed platforms could be covered with a tight plastic enclosure in preparation for sandblasting and painting operations.

The enclosure captured fine sandblast grit and debris while virtually eliminating particulate emissions, and contained airborne paint mist and droplets that otherwise might overspray the neighborhood.

"Dust emissions are down to virtually zero," said Dana Austin, corporate environmental manager for Southwest Marine.

"We capture all the fine material in a dust collector, and we have extremely effective fugitive-emission-control for the protection of the environment."

Sheets come in four-foot-wide rolls that open up to 26 by 62 feet, and the tape measures up to six inches wide.

Sandblast clean-up is easy, according to Michael Chee, environmental engineering supervisor for NASSCO. With the enclosure still intact, workers use air lines and ventilation blowers to clean particles from the ship's surface, scaffolding and enclosure.

A dust collector traps fine materials at the base, and an industrial vacuum collects small debris.

NASSCO uses shrink wrap on repair projects and is evaluating the use of the process for new ship construction.

For additional information on the cost and environmental advantages of using shrink wrap,

Circle 27 on Reader Service Card

June, 1993

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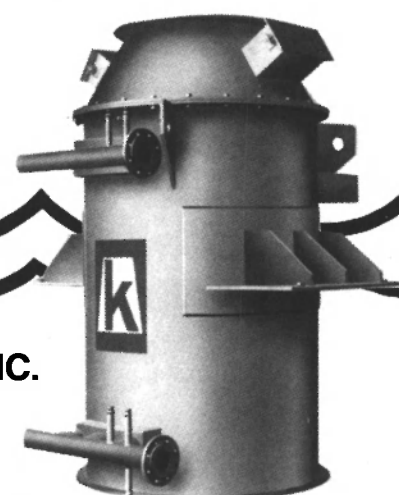
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KONUS heat recovery unit, above, used with a fired heater, part of custom designed systems for marine cargo heating

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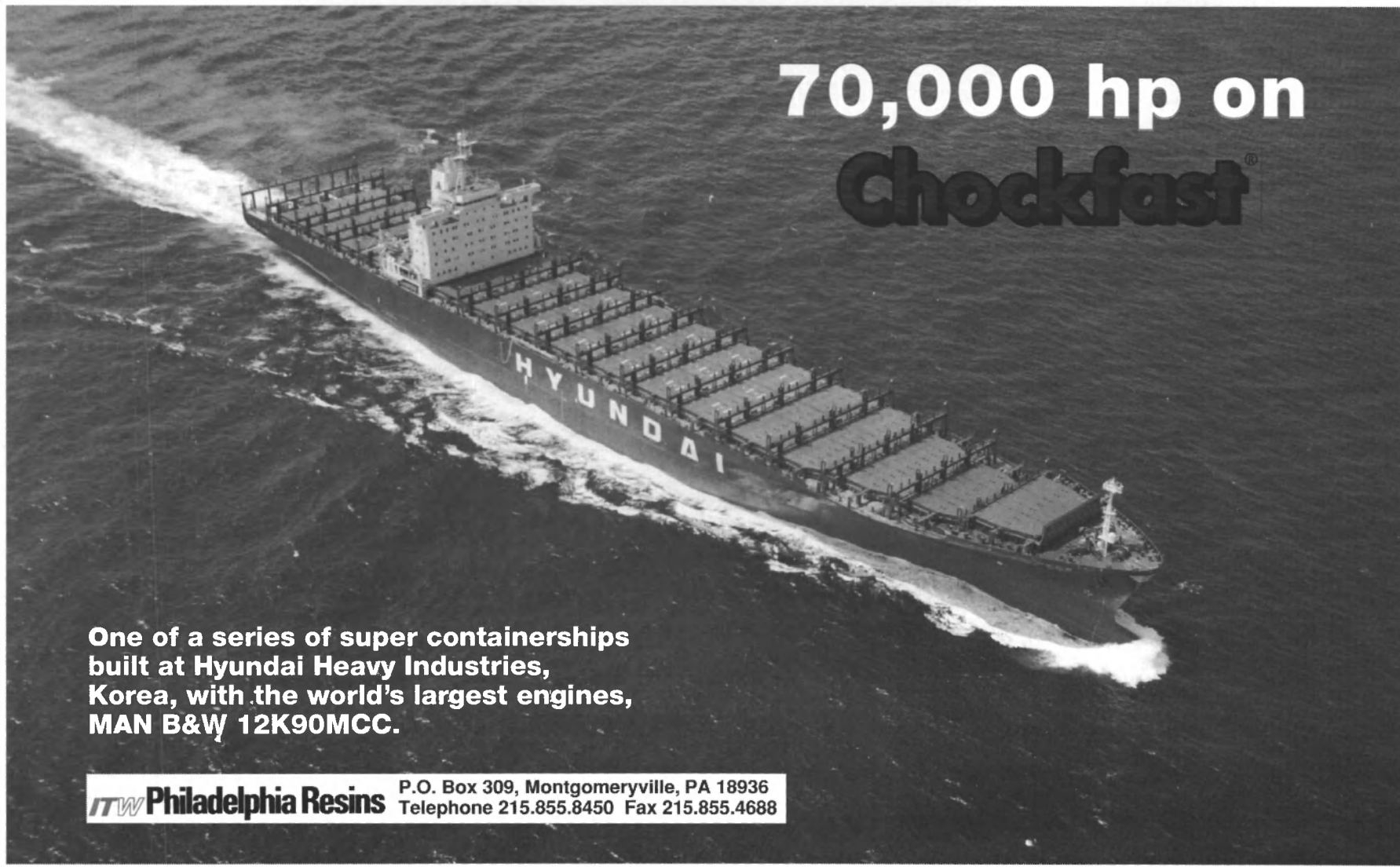
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U.S. WATERBORNE FOREIGN COMMERCE – 1991
PORT RANKING BY CARGO VALUE

(MILLIONS OF DOLLARS, 000s OMITTED)


IMPORTS			EXPORTS			TOTAL		
Rank	Port	Value	Rank	Port	Value	Rank	Port	Value
1	Los Angeles (CA)	\$45,129	1	New York/New Jersey	\$17,861	1	Los Angeles (CA)	\$57,375
2	Long Beach (CA)	37,020	2	Houston (TX)	14,280	2	New York/New Jersey	49,575
3	New York/New Jersey	31,714	3	Los Angeles (CA)	12,246	3	Long Beach (CA)	48,863
4	Seattle (WA)	20,201	4	Long Beach (CA)	11,843	4	Seattle (WA)	26,012
5	Tacoma (WA)	17,446	5	Hampton Roads (VA)	10,294	5	Houston (TX)	24,901
6	Oakland (CA)	10,821	6	Oakland (CA)	7,587	6	Tacoma (WA)	23,509
7	Houston (TX)	10,621	7	Baltimore (MD)	7,496	7	Hampton Roads (VA)	19,174
8	Baltimore (MD)	9,018	8	Charleston (SC)	7,206	8	Oakland (CA)	18,408
9	Hampton Roads (VA)	8,890	9	New Orleans (LA)	6,502	9	Baltimore (MD)	16,604
10	Charleston (SC)	6,748	10	Tacoma (WA)	6,063	10	Charleston (SC)	13,954
11	Port Huron (MI)	5,724	11	Miami (FL)	6,001	11	New Orleans (LA)	11,428
12	Savannah (GA)	5,475	12	Seattle (WA)	5,811	12	Savannah (GA)	10,591
13	New Orleans (LA)	4,926	13	Savannah (GA)	5,116	13	Miami (FL)	9,608
14	Jacksonville (FL)	4,903	14	Gramercy (LA)	5,097	14	Gramercy (LA)	8,034
15	Philadelphia (PA)	4,881	15	Portland (OR)	3,290	15	Jacksonville (FL)	7,483
16	Portland (OR)	3,738	16	Jacksonville (FL)	2,580	16	Portland (OR)	7,028
17	San Francisco (CA)	3,654	17	Baton Rouge (LA)	2,355	17	San Francisco (CA)	5,796
18	Miami (FL)	3,607	18	Wilmington (NC)	2,211	18	Port Huron (MI)	5,731
19	Boston (MA)	3,306	19	Anchorage (AK)	2,204	19	Philadelphia (PA)	5,704
20	Corpus Christi (TX)	3,118	20	San Francisco (CA)	2,142	20	Port Everglades (FL)	4,873
21	Port Everglades (FL)	2,886	21	Tampa (FL)	2,009	21	Baton Rouge (LA)	4,636
22	Gramercy (LA)	2,423	22	Port Everglades (FL)	2,007	22	Corpus Christi (TX)	3,946
23	Texas City (TX)	2,319	23	Wilmington (DE)	1,889	23	Boston (MA)	3,893
24	Baton Rouge (LA)	2,281	24	St. Rose (LA)	1,755	24	San Juan (PR)	3,723
25	Chester (PA)	2,251	25	San Juan (PR)	1,339	25	Wilmington (DE)	3,284

Note: Rankings are based on waterborne foreign commerce and do not include cargo moved domestically between U.S. ports.
Source: U.S. Bureau of the Census.



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New Director Of L.A. Port Construction And Maintenance Appointed

Joannie Mukai was appointed director of the Port of Los Angeles' Construction and Maintenance Division, announced **Dwayne Lee**, the Port's deputy executive director of development.

"The Construction and Maintenance Division is an integral and important component of the Port team, and it is a pleasure to be able to designate **Joannie** as head of that division," Mr. Lee stated.

As director of the Port's largest division, Ms. **Mukai** will oversee a staff of approximately 250 employees who are responsible for the alteration, reconstruction and repair of all Port-owned facilities.

Ms. **Mukai's** appointment becomes effective immediately.

A veteran of Los Angeles City service, including 13 years with the Port of Los Angeles, she has served as acting director of Port Construction and Maintenance for the past nine months following the retirement of the former director, **Roy J. Cootes**.

U.K.) is installing an Inmarsat-A terminal and Marinet communication system on its new European ferry service, The Pride of Bilbao.

The Pride of Bilbao will be operating as a business and conference center as well as a ferry service between Portsmouth & Bilbao. The vessel had previously been with Viking Lines, operating between Sweden and Finland. The 37,500-ton cruise ship will reportedly be the largest ferry operating from the British ports.

As part of the essential business communications on board the vessel, full fax and telex facilities will be made available to business and conference passengers. This has been made possible by using a Marinet system installed with the Inmarsat-A terminal.

The details of a fax or telex can be entered into an on-board PC and routed over satellite to the company's on-shore hub system and then on to the final destination at a fraction of the cost of standard satellite traffic.

For more information on Marinet systems,

Circle 70 on Reader Service Card

European Ferry Will Use Marinet For Satellite Communications

P&O Ferries Ltd. (Portsmouth,

JBF Scientific To Deliver Fast-Response Skimmers

JBF Scientific Company, Inc. of Southwest Harbor, Maine an-

nounced contract awards for six of its new oil spill recovery vessels designed to operate in the fast response and shallow water environment.

The State of Texas G.L.O. has contracted for five 22-foot skimmers, and Irving Oil Limited of St. John, New Brunswick, Canada has ordered the company's new 45-foot catamaran.

The State of Texas G.L.O. plans to position the shallow-water skimmers strategically along the gulf coastline for rapid response.

The skimmers operate with specially treated, industrial duty inflatable catamaran pontoons, and allow for retraction of the oil recovery module for fast response.

The new Irving Oil vessel will be the first of its kind in eastern Canada and is the result of a joint venture between JBF and Stenpro of Liverpool, Nova Scotia.

Constructed in aluminum, the 45 x 15-foot catamaran will be capable of collecting 11.314 bbls/day of water-free oil, transiting at 15 knots, and storing 4,000 gallons of recovered oil onboard.

Spurs Vessel Cutter Avoids Oil Pollution, Damage To Oil Seal Bearings

The Spurs line, net and weed cut-

ter, used by more than 40,000 commercial, Navy and pleasure boats worldwide, is now available for larger oceangoing vessels from Spurs Marine Mfg., Inc., Ft. Lauderdale, Fla.

The large vessel Spurs cutters are based on the original Spurs cutting principle, which was patented in 1982 and is in service by virtually every type of boat manufactured including a number of vessels which were used by the U.S. Coast Guard and Navy.

The new Spurs design developed for larger vessels has virtually no wearing parts.

The large vessel design consists of two small assemblies and is very compact and easily installed.

One cutter assembly is mounted on the propeller; while the other cutter assembly is mounted in the rope guard.

Oceangoing tug boats, cruise ships, containerships and other large vessels may now protect their shaft seals and running gear and avoid costly down time with the use of the Spurs propeller antifouling device. Easily-mounted, the hardened stainless steel cutters cut lines as large as mooring lines.

Large vessel operators now have protection from bearing and bearing seal damage with the use of the Spurs cutters.

The Spurs reportedly protects shaft seals which, if damaged, can cause oil to leak, costly repairs and idle drydock time.

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June, 1993

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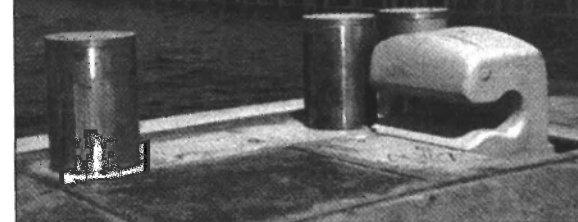
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YARD PROFILE



Avondale's 20,000-ton drydock.

Photo Credit: Ricky Kellum

AVONDALE: Turning To Quality, Productivity To Stay Competitive

Avondale delivered 16 vessels in a 19-month span, according to **Ron McAlear**, vice president of advanced programs and marketing, but this New Orleans-based builder is far from resting on its laurels. All told, 1992 shaped-up as an impressive year for the employee-owned company, and that momentum has continued into 1993.

The company's latest financial results indicate a \$348,000 first-quarter profit, versus a more than \$8 million loss for the same period just a year before. The Shipyards Division currently has approximately \$580 million on its orderbook, a total which includes eight newbuilds for the U.S. Navy (four T-AO's, three LSD's and one T-AGS 45) and one MHC for outfitting. While recent Department of Defense budget cuts strike an ominous tone for many U.S. yards, Avondale is aggressively exploring means to soften the blow.

"Defense cuts overall will hurt

the industry," said Mr. **McAlear**. "It is going to hurt, but perhaps it will hurt us less because we are so commercially oriented."

Currently the company has bids for: two tankers and two options with Texaco; up to 12 Sealift new construction ships; two sealift conversions; one polar icebreaker; and one LSD.

"We are in decent shape, because we have proven our ability in the past to diversify," said Mr. **McAlear**.

1992: A Good Year

Avondale Industries, in 1992, was recognized as one of the safest shipyards in the nation, as it was awarded, for the second consecutive term, the Occupational Safety and Health Administration (OSHA) Star Award. Avondale is also involved in OSHA's Voluntary Protection Program, and since the conception of the program, the lost workday rate

has dropped to 72 percent and the incident rate has dropped to 61 percent.

During a four-week period in May and June, the company successfully launched two ships, had one delivery and one commissioning, all for the U.S. Navy. That time period saw the commissioning of the USS Ashland (LSD 48), the launching of the USNS Tippecanoe (T-AO 199) and the USNS Waters (T-AGS 45), and the delivery of the USNS Big Horn (T-AO 198).

In all, the year also saw the Shipyards Division accomplish two keel layings, three launchings, five builder's trials, three acceptance trials, and deliveries of five ships and a floating prison.

A Long History; A Promising Future

Avondale's Shipyards Division began in 1938 as Avondale Marine

Ways, Inc., a small, independent barge construction and repair facility. Growing in response to demands created by the record expansion of south Louisiana's oil industry, and by the continued development of the Port of New Orleans, Avondale Marine Ways gathered together a corps of skilled employees, which eventually grew to become the Avondale Shipyards, Inc.

Today Avondale Industries Inc. is 5,700-employees strong, and the Shipyards Division facility totals 268 acres, containing three outfitting docks and supporting shops. There is an upper shipbuilding area which is capable of constructing ships up to 250,000-dwt or three conventional-sized ships concurrently, and a lower shipbuilding area which is capable of building five 792-foot LASH ships concurrently. Ships built in the upper area move laterally in three positions for launching by Avondale's large floating drydock. This dock is also used for repairs and has fre-

quently made three-vessel lifts, with a lifting capacity of 81,000 tons. Ships built in the lower yard move laterally toward the river and parallel to the river in five positions and are side-launched. A Panamax dock is moored at the lower end of the outfitting docks for the repair of ships and to support the docking requirements of new construction.

Avondale's metal fabrication, which is capable of fabricating up to 175,000 tons of steel per year, utilize three primary shops, the 178,000-sq.-ft. Plate Shop; the 27,700-sq.-ft. Tee-Beam Shop; and the 4,800-sq.-ft. Blacksmith Shop.

Avondale maintains a full-service Engineering Department of more than 350 employees skilled in all disciplines.

"The future of U.S. shipbuilding is becoming more competitive on the international markets, and the subsidies issue aside, U.S. yards must increase their productivity and quality to survive," said Mr. McAlear.

To keep abreast of changes, Avondale has invested heavily in facility improvements, with a total of more than \$258 million invested since 1970 and continuing investments of more than \$3 million per year.

In another effort to tap the international market, Avondale continues its technology transfer and investment program, and has completed its direct technology transfer program with Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI). The program was fully implemented in the construction of the T-AO 187 and LSD-41 class ships, including: extensive detailed advanced planning; package unit and zone design; process lane fabrication standardization; line heating forming techniques; the IHI system of accuracy control; heavy concentration in machinery and piping packaging; and post-outfitting by zone. The construction system is supported by the SPADES System of fairing and parts generation; CADAM drafting system; COPICS material control system; and the diversified CIPREC Management Information System.

NOL Shipyard Wins Contract To Build Three Clean Product Tankers

Atlantis Engineering & Construction, a shipyard subsidiary of one of Singapore's largest shipping lines, Neptune Orient Lines Ltd. (NOL), announced it has won a contract for three clean product tankers worth an estimated \$28.5 million.

Work on the first of the 6,500-dwt vessels is under way, and delivery is due early next year. The single-hull ships are designed for a 12-knot service speed.

The yard has built three other tankers, including a pair of 4,000-dwt vessels for Meridian Shipping and a 4,500-dwt model for NepTank Bunkering Services.

Brent Trans. To Transfer Tank Barge Registry

Brent Transportation Corp., Greenville, Miss., has received the Maritime Administration's (MarAd) permission for the transfer to Panamanian registry of the tank barge B-123. MarAd previously approved the sale of the barge by Brent Transportation to Compania Central Financiera Importadora Y

Exportadora S.A., a Panamanian corporation. The barge was built in 1966 in Tell City, Ind.

Higher Accuracies In Crankshaft Work Offered By In-Place Machining

In-Place Machining Company, Milwaukee, Wis., is now utilizing recently developed "Phase IV" equip-

ment and instrumentation for refining engine crankpin and main journals in-place in the engine.

"Phase IV" equipment, together with newly-developed instrumentation, is also being utilized to produce higher accuracies when line boring diesel engines. The new equipment reportedly assures shipowners, power plant operators and insurers that engine repairs are being accomplished to new higher standards of excellence.

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Titan's State-Of-The-Art Refloating Techniques Come Through In A Pinch

A specialist in wreck removal, Titan Maritime Industries, Inc. of Ft. Lauderdale, Fla. successfully raised two vessels recently, one marking its first job in Europe.

The first, the raising of the 8,000-ton M/V Frota Humaita from her

capsized positioning in the Port of Dunkirk, highlighted Titan's state-of-the-art raising techniques and capabilities.

The vessel was raised without the aid of external heavy lift equipment, a method which was declared impossible by a number of the company's competitors. In a sense, the vessel was raised by computer, as the extremely precise pumping sequence was determined by a purpose-designed computer program.

The physical results so accurately followed the computer projections that the vessel reportedly never had more than two degrees of heel off that which was anticipated. The 459-foot vessel was sunk in 59 feet, flooded in all compartments and listing 58 degrees. The ship was refloated 24 days after the official starting date.

More recently, in March of this year, the Ocean Princess struck a submerged obstruction shortly af-

ter departing her berth in Belem, Brazil. The resultant flooding required that the vessel be beached, and almost immediately the vessel started a nearly non-stop descent into the mud bottom.

Titan, acting on speculation, arrived with divers and equipment to undertake an immediate underwater survey, and two days later was awarded three simultaneous "day rate" contracts for pollution control and clean up, for diving services to survey damage, and for salvage services.

The intent was that contracts would terminate once terms for a lump sum, "no cure, no pay" contract had been agreed upon. Prompt action was needed at the outset, as the vessel was settling into the mud at the rate of more than three feet per day. The job was a race against the mud, as deck after deck disappeared under the surface. Pumping commenced after the contract was signed, and together with Titan's in-house salvage crew, naval architects and computer and computer operator, the vessel was re-floated and delivered to a safe anchorage with a nine degrees list to port just 38 hours later.

For more information on Titan Maritime,

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One-touch channel selection as well as direct access to channel 16 and the weather channels is so easy it can be done in heavy

gloves. The LCD display is oversized and backlit. And options like the external speaker/microphone which allows hands-free operation make it ideal for tankers, tenders and oil rigs.

The HX220AS is a lot of radio in a remarkably small and lightweight package. To find out more about it, or about Standard's intrinsically-safe eight-channel HX340 UHF and VHF handhelds, call or write today.

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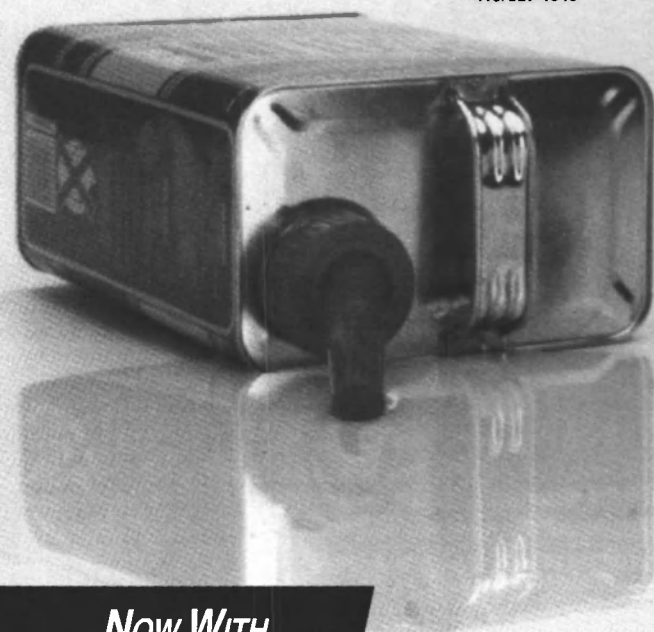
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Also available: the eight-channel HX340 UHF or VHF.



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Trellex Fender Opens New Office In South America

The Trellex Fender Division, part of Sweden's Svedala Industries, has opened a new office in Santiago, South America, to strengthen the position it has established there.

Trellex also has an office in Kuala Lumpur, which it opened in 1991, and continues to grow.

The Trellex V-fender is a simple design based upon a modular system with UHMW-PE low friction facing. The fenders are manufactured under high pressure and temperature, which makes the process unique. Trellex has won many contracts throughout the world and also has an exclusive marketing agreement with CRP of the U.K., which allows Trellex to promote foam-filled floating fenders.

Texas Drydock To Convert Rigs For Cliffs Drilling

TDI Offshore, a subsidiary of Texas Drydock, Inc., Orange, Texas, and Cliffs Drilling have entered into a construction contract for two rig conversions.

Construction work on the Cliffs Rigs 8 and 10 will be performed at TDI Offshore's Sabine yard. Work will involve the conversion of both rigs from the drilling to the production mode. With the delivery of these two conversions, TDI will have completed a total of three such conversions to date for Cliffs. TDI Offshore is involved in the new construction, repair and turnkey modification of offshore rigs, and the drydocking and repair of oceangoing barges.

Maritime Reporter/Engineering News

SHIP'S FINANCE

Making Ends Meet: Juggling With Finances Can Help Shipowners Achieve Profitability

If recent experience of the freight markets has taught us anything, it is that shipowners would get a better rate of return by putting their capital under the mattress than investing in new ships.

At the same time we know - because everyone involved keeps telling us so - that the world merchant fleet is in urgent need of replacement. Indeed, the spate of accidents involving old tankers and bulk carriers has confirmed this need.

Owners expect their tonnage to have a limited economic lifespan, and those serious about being in the business make arrangements and allowances to cover this. However, if owners cannot guarantee to recover new investment, let alone make any return on capital, how is this fleet replacement program to be effected? Who will fund it? What will it cost?

In a new report entitled "Finance for Ships," Drewry Shipping Consultants Ltd. takes a considered look

at the current mismatch in the ship finance sector: between owners who would like to borrow but can't afford to repay loans out of operating income, and banks who have money to lend, but are increasingly skeptical about lending to the shipping industry.

Estimates of newbuilding demand to the end of the decade, together with potential secondhand activity, suggest that owners may be looking to raise between \$240 and \$320 billion from lending institutions and other investors between now and the year 2000.

As many banks were stung in the previous market downturn in the 1980s, they are becoming more reluctant to lend funds for shipping investment and, given that they only have limited reserves available, they can afford to choose only the more secure projects and creditworthy borrowers.

It is enlightening to realize that, on the basis of representative costs

and income, a VLCC built in 1970 or 1971 quickly repaid the owner's investment, but since then there has never been an occasion when capital has been fully recovered over the normal working life of a VLCC. A similar, though less dramatic picture can be painted for smaller tankers and dry bulk carriers. This illustrates the importance of tax advantages offered to shipowners. Without tax advantages, investing in shipping would appear to hold no hope of making a profit as well as showing that flags of convenience

are, for many, a requirement rather than a luxury. Of course, sometimes it is better to pay the tax than invest in ships, and it appears that 1993 is one of those times.

On the other hand, for cash-rich companies and individuals looking for the possibility of a big return, the secondhand market offers many opportunities to pick up tonnage at what may well in a few years time seem bargain basement prices. However, the high-profile failure of a number of investment vehicles set up in the late 1980s to take advan-

Total Interest Payments Under Different Loan Terms

Basis: VLCC newbuilding ordered 1981, at \$67.7 million, repayments over 8.5 years (\$ million)

OECD standard terms	20.64
Commercial rate (Libor + 1%), 80% loan	24.56
Commercial rate (Libor + 1%), 70% loan	22.95
Commercial rate (Libor + 2%), 70% loan	25.33
Commercial rate (Libor + 1%), 70% loan, yen denominated	19.96
Commercial rate (Libor + 1%), 70% loan, 3 year capital moratorium	29.18
Commercial rate (Libor + 1%), 70% loan, 40% balloon	26.11
50% loan at Libor + 1%, plus 20% subordinated loan at Libor + 3% with 100% balloon	29.74

Source: Drewry Shipping Consultants Ltd.

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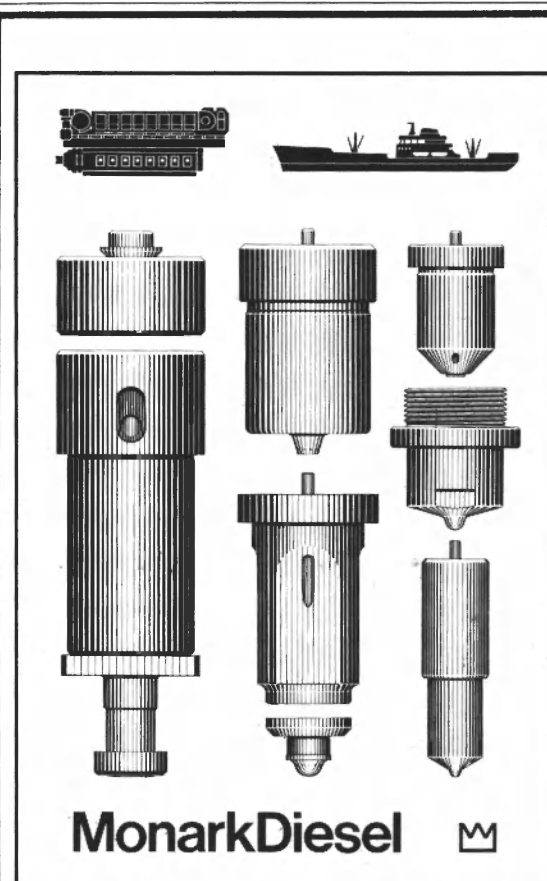
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tage of asset plays on the S&P market, meaning that private placements or public offerings of equity in such ventures are likely to be met with a stony response.

Owners do have the ability to exert some influence over the cost of their borrowings.

As the table shows, the total interest payments on a newbuilding can vary by as much as 50% - although the most expensive funding

arrangements tend to be those which offer lower repayments in the short term, and may be the only way to allow owners to run to profit.

The problem of adequate funding is central to the development of the shipping industry over the next decade.

The pace of investment in new tonnage will largely be determined by the ability of owners to raise funds from investors, and in turn

will provide a direction to the freight market. Anyone involved in the shipping industry will need to be aware of the scale of the problem and remain informed of the options available. Drewry's new report provides a valuable tool to all those with an interest in shipping, as owner, charterer, builder, or financier. For more information, contact Drewry Shipping Consultants Ltd., 11, Heron Quay, London E14 4JF.

Intermarine To Launch Third Osprey Class Minehunter

Intermarine USA recently launched the U.S. Navy Minehunter Oriole (MHC-55).

The Oriole, launched May 22 into the Savannah River in Savannah, Ga., is the third U.S. Navy ship of the Osprey class to be launched by Intermarine. The ships are designed for mine hunting under all environmental conditions and are the world's largest vessels to be constructed entirely of fiberglass. **Barbara Robinson**, wife of Baltimore Orioles Hall of Famer **Frank Robinson**, was the ship's sponsor.

Oriole is a larger version of the highly successful Lerici class Italian Minehunters that served in the Persian Gulf to assist in Operation Desert Storm mine clearance.

Intermarine USA of Savannah, Ga., is a subsidiary of the Ferruzzi Group. Ferruzzi-Montedison is a leading international industrial group, with worldwide aggregate turnover of \$25 billion.

Hagglunds Marine Wins Multiple Orders

A leading international manufacturer of cargo, service and offshore cranes, Hagglunds Marine has announced record orders during the first quarter of the year.

The first order was for 74 crane units for 18 vessels being built predominantly by German shipowners at yards in Poland, Germany and Korea. Dominating the orders (49 of the 74) are rope-luffing cranes type GL. GL is a container and cargo handling crane with a lifting capacity of five to 50 tons; it is totally enclosed and hydraulically driven. To date Hagglunds Marine has more than 6,000 cranes in operation and employs a workforce of 400. For more information on Hagglunds,

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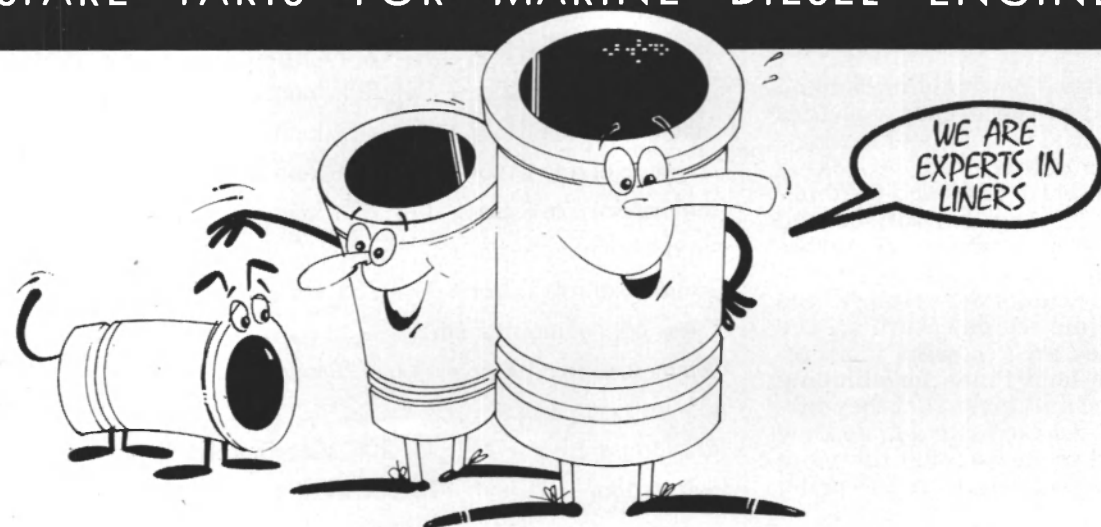
MagneTek Transformers Designed Especially For Marine Applications

MagneTek has announced its newest line of transformers designed specifically for the requirements of marine applications. The new marine-duty transformers are "ruggedized" for the environmental, noise and reliability demands of all types of commercial and pleasure ships, offshore oil rigs, dockside applications and other harsh environment settings. The marine transformers are dry-type, copper-wound designs. Features of the transformers include: low profile for easy integration; low noise design; internal bracing as required for shipboard duty; vibration mounting available; and 2.5, five and 10 percent taps available.

For more information,

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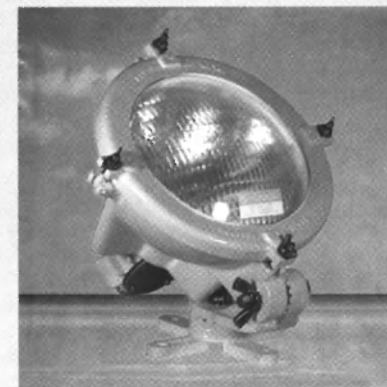
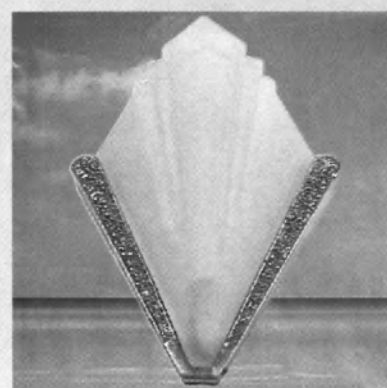
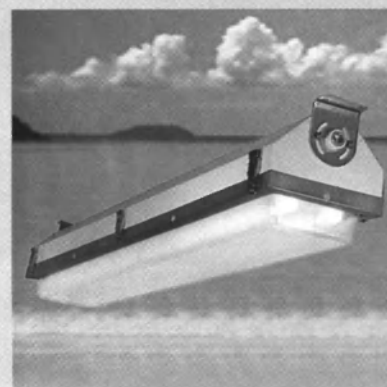
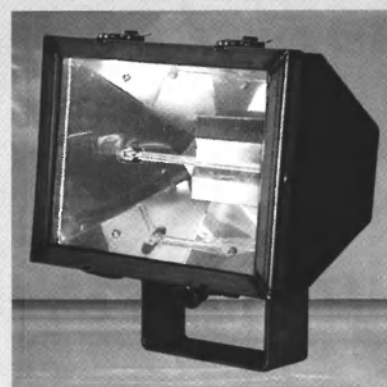
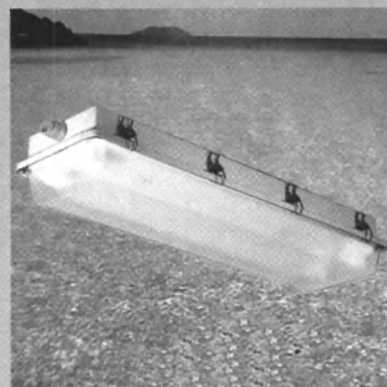
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Miller Electric Provides Economical Diesel Powered Welder/Generator

For field welding and power generation, the economical Bobcat™ 225D diesel powered engine driven welder/generator from Miller Electric Mfg. Co. provides multi-process welding capabilities and up to 8,000 watts of auxiliary power. Equipped with a Deutz/Ruggerini state-of-the-

art diesel engine for industrial application, the Bobcat 225D also features a Miller engineered alternator for excellent welding characteristics and 60 Hz 120/240 VAC power to operate lights, hand tools and more.

The Bobcat 225D delivers AC/DC weld output for SMAW (stick), DC GTAW (TIG) and noncritical AC GTAW (TIG) welding as well as providing GMAW (MIG) welding and flux cored arc welding (FCAW) from constant voltage setting with fine

adjustment. Rated weld amperes, constant current, at 100% duty cycle are: 225 amps AC at 25V, 210 amps DC at 25V; constant voltage output is 200 amps DC at 20V.

For smooth stick welding, the unit offers a six position range switch-AC/DC constant current switch with fine adjustment in each range. It can also weld with alloy and mild steel (including E-6010) electrodes. Additional features include a 12V electrical system and maintenance free battery, engine protection with

low oil safety automatic shutdown system, large 7.5 gallon fuel tank for hours of operation and durable construction with wrap-around base for maximum protection.

For more information on the Bobcat 225D,

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Circle 165 on Reader Service Card

Engine Room Fire Protection Systems Installed

The world's first water fog fire protection systems in a ship's engine room have been installed and commissioned in the new seismic vessels GECO Diamond and GECO Topaz by Marioff Hi-fog OY. The combined Hi-fog machinery and accommodation space system has been fully approved by the Norwegian Maritime Directorate and Det Norske Veritas and protects the engine room, emergency generator room, compressor room, incinerator room, galley, mess rooms and lounge. The GECO Topaz also has sprinklers in the cable and paint stores. The vessels have been built at the Norwegian yards Bratvaag and Flekefjord. A combined Hi-fog machinery and accommodation space system is also currently being installed at the Fosen Mek yard in Rissa, Norway on the Askoy RoRo ferry 'MS Bergen'.

For more information on Hi-fog from Marioff,

Circle 16 on Reader Service Card

MarAd Approves Farrell's Time Charter Request

A request by Farrell Lines, Inc. to time charter the foreign-flag vessel MV OOCL CHALLENGE has been granted by the Maritime Administration (MarAd). The request from Farrell Lines is for a one-way sail from the U.S. east coast to the Mediterranean carrying excess cargo from Farrell's scheduled vessels that are filled to capacity. Neither Lykes Bros. Steamship Co., Inc. nor Sea-Land Service, Inc. object to Farrell transporting this cargo on the foreign-flag vessel.

MarAd has also approved requests from Global Marine North Sea Inc. and Global Marine Nautilus Inc. to transfer three drilling barges to Panamanian registry. The three vessels will be used in offshore drilling operations in the United Kingdom sector of the North Sea.

Permission is sought from MarAd by Alpha Marine Services, Inc., of Galliano, La., for the transfer of the 1,573-gross ton research vessel GECO MARLIN to Vanuatu registry. If MarAd grants permission for the transfer, the vessel would be used in seismic and research operations in the Gulf of Mexico.

Coast Guard Considers Seven Port Zones For Establishing New Vessel Tracking System

Cost Estimate For A Total Of 23 Port Zones—\$327 Million

The Oil Pollution Act of 1990 (PL 101-380) directed the Secretary of Transportation to conduct a study to prioritize the U.S. ports and channels that are in need of new, expanded, or improved Vessel Tracking Systems (VTS). Research Special Programs Administration's Volpe National Transportation Systems Center conducted the study, called the *Port Needs Study*, between February 1990 and July 1991 at a cost of \$2.8 million. The Secretary of Transportation submitted the study to Congress in March 1992.

The act required that the study prioritize the U.S. ports and channels by evaluating

- the nature, volume, and frequency of vessel traffic;
- the risk of collisions, spills, and damages associated with that traffic;
- the impact of installing, expanding, or improving a VTS system; and
- all other relevant costs and data.

The *Port Needs Study* prioritized the need for Vessel Tracking Systems in U.S. ports and channels by establishing preliminary budget and benefit estimates for the Coast Guard to use in determining where to establish or improve VTS systems. For comparison purposes, the study grouped 82 major U.S. ports and their adjacent bays, rivers, seaward approaches, and other bodies of water into 23 port zones. Prince William Sound, the site of the Valdez oil spill, was not included in the study because the Congress had already legislated the expansion and improvement of the Prince William Sound VTS system in the Oil Pollution Act of 1990. These ports load and unload 80 percent, by tonnage, of all U.S. international and domestic cargo. The study identified seven of the 23 port zones as the areas the Coast Guard should initially consider when determining where to establish or improve Vessel Tracking Systems.

The study prioritized the 23 port zones by developing benefit and cost estimates of potential U.S. Coast Guard VTS systems in each port zone. The Coast Guard's plans for installing and improving VTS systems, as indicated by its fiscal year 1993 budget request, are consistent with the study's recommendation.

Ninety-one percent of the \$26.8 million that the Coast Guard requested for fiscal year 1993 to es-

tablish and improve VTS systems is earmarked for the identified port zones. The Coast Guard currently estimates that it will cost \$145 million in investment funds through fiscal year 2001 to establish or improve VTS systems in these port

costs and annual operation and maintenance costs. Total costs for an individual VTS system range from \$6 million for Portsmouth, New Hampshire, to \$37 million for New Orleans, Louisiana. The total cost estimate for all 23 port zones is

cost estimates that are consistent and comparable among the 23 port zones. Each candidate system employs state-of-the-art equipment and provides surveillance for the entire port zone. For comparison purposes, initial investment costs were assumed to be committed in fiscal year 1993 and operation and maintenance costs were estimated from fiscal year 1996, when the study assumes for comparison purposes that the systems will become operational, through fiscal year 2010. All costs are discounted back to 1993.

Benefit estimates for each port zone were based on the cost of vessel accidents and associated consequences expected to be prevented by the candidate VTS system. The estimates were based on a statistical analysis of historical vessel accidents and the unique navigational features of each port zone to determine the probability of vessel accidents occurring in each port zone.

The total benefit estimate for all 23 port zones is \$806 million.

The study predicts that the candidate systems would prevent \$1.6 billion in damage caused by hazardous commodity spills between 1996 and 2010.

Emergency Response

The dollar value of emergency responses to vessel accidents is estimated by the type of vessel and the type of response required. The study predicts that the candidate systems would prevent \$10.4 million in emergency response costs between 1996 and 2010.

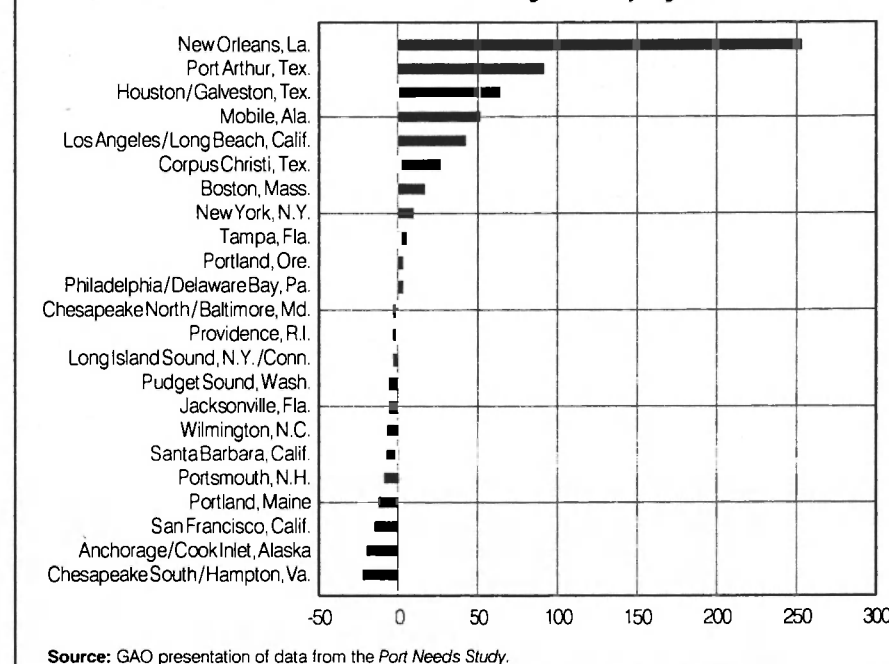
Figure 2 shows the locations of the seven port zones currently being considered under VTS 2000 and the eight VTS systems the Coast Guard operates (Houston/Galveston is included in both categories.)

The Coast Guard is focusing its efforts on establishing new VTS systems primarily in the seven port zones identified by the *Port Needs Study* as the areas that the Coast Guard should consider initially. The Coast Guard is using a benefit/cost analysis to determine the specific areas of the port zones to be monitored and its professional judgment to determine the performance specifications of the systems.

The study divided each of the 23 port zones into subzones based on water-body type, such as river, enclosed harbor, or constricted water-

(Continued on page 128)

FIGURE 1
Net Benefit Estimates Of VTS Systems, By Port Zone



Source: GAO presentation of data from the Port Needs Study.

zones and eight others identified by the study, and to improve other existing Coast Guard-operated Vessel Tracking Systems.

Cost estimates for each port zone were based on initial investment

\$327 million. Investment costs were estimated by developing a "candidate" VTS system for each port zone. The candidate VTS system's design is a preliminary engineering design made for the purpose of developing

FIGURE 2
Location Of Existing And Proposed Coast Guard VTS Systems



ASTANO Appoints RR Klattenberg As New Agent

RR Klattenberg Marine Agency has been named exclusive agents in the U.S. and Canada for Astilleros y Talleros del Noroeste SA, (ASTANO) La Coruna, Spain.

The shipyard has implemented Quality Assurance programs in accordance with ISO 9001 for shipbuilding and offshore construction issued by ABS and DNV, and also in accordance with ISO 9003 for shiprepairing which has led to tighter repair time and competitive pricing. The greatest success of this latter program has been in the Scandinavian market with over two dozen repairs awarded from Norway in 1992.

With facilities strategically located in Northwest Spain, a full range of services are available for general shiprepairs including application of external and internal coatings.

For more on RR Klattenberg,

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Swedish Shipowners Renew Bid To Government For Second Register

Swedish shipowners have been pressing the government for years for a second register that would allow Swedish-flagged ships to trade competitively in international markets. The shipowners are hoping to model the second register after the successful Danish International Register of Shipping. But before the government will consider new proposals for an international register, the shipowners must cut overhead by at least 15%.

Tax relief arrangements for Swedish shipowners expire at the end of the year, and some shipowners are threatening to defect to other, cheaper registers unless the matter is resolved quickly.

Lang Cooking Equipment Now USCG Approved

U.S. Coast Guard approved cook-

ing equipment listed to UL 197, including the marine supplement, is now available from Lang Manufacturing Company. This certification is a marine vessel operator's assurance that their marine galley cooking equipment will pass U.S. Coast Guard inspections to regulation 46 CFR 111.77-3 (a).

Lang, a manufacturer of marine cooking equipment since the 1930's, is reportedly the only company to have a complete line of ranges, fryers, griddles, convection ovens, and all-purpose ovens that are MARINE UL 197 listed, including the latest marine supplement update.

For more information on Lang MFG products,

Circle 25 on Reader Service Card

New SIMRAD/Anritsu Radar Showcases Latest Technology

SIMRAD/Anritsu's 770 Series, 10-inch, 4kW radar combines sophisticated technology with full line features for performance usually found

in larger units.

Anritsu's newly-developed large scale circuitry (LSI) automatically controls tuning, gain, sea and rain clutter for simple operation. An on-screen menu allows custom programming of feature keys such as STC and FTC to display North-Up, VRM/EBL float and other information with the touch of one button. Manual adjustments are available.

Advanced microprocessors constantly control performance of the radar, discriminating viable target echoes from noise to display the clearest screen possible. The amber-colored screen minimizes annoying glare. The 770 Series radar features dual VRMs and EBLs along with 10 range scales down to 1/8 mile for navigation in close quarters. Other features include off-centering, Echo stretch, parallel cursor and programmable guard zone. The 770 Series radar is available with a rugged dome antenna (36 nm range) and three- or four-foot open array (48 nm range).

For more information from SIMRAD, Inc.,

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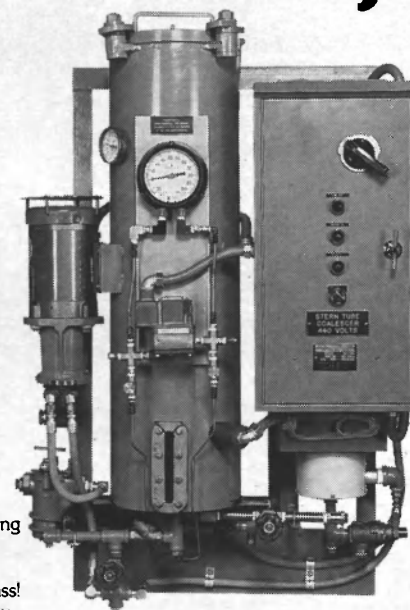
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Maritime Reporter/Engineering News

Pioneer Research's Binocular Improves Night Vision

Pioneer Research has launched the Navy One 7x50 marine binocular that greatly improves vision in low light and at night.

The new Navy One's exclusive optics lifts the foggy gray veil that covers faint objects. Each of the Navy One's 14 glass surfaces is treated with SPARC lens coating. The SPARC (Stimulated Penetration Anti-Reflection Coating) lens treatment eliminates internal glare and ghost images. The result is an extremely bright binocular that delivers 95% light transmission and clear, rich contrast in bright sunlight, low light or at night.

Built to U.S. Navy specifications, the Navy One is shockproof and waterproof. It is built from a lightweight aluminum and encased in a black rubber armor to withstand the rigors of marine operations.

For more information about the Navy One marine binocular,

Circle 19 on Reader Service Card

High Performance Seats Designed By Air Vehicles Limited

Air Vehicles Limited introduces a new high performance seating system for fast ferries. The system is an addition to the Advanced Seating Technology series of Civil Aviation Authority approved seats built by Air Vehicles for use in hovercraft. Designated AST 3000, the new system has been designed to meet the proposed future seat requirements of the U.K. Department of Transport but with a significant weight reduction over currently available systems.

The seat foam is molded to improve durability and is designed to fully protect the passengers from the 'hard' structure. Accessories are also integrated into the seat design to give a smooth, safe aspect in the event of an accident.

The system is supplied to the ferry builder ready to install, and particular attention has been paid to ensure correct and rapid assembly. Only two fixings per seat are required, compared with eight in similar systems, hence a substantial saving in fitting time.

Air Vehicles Limited, with its aircraft/hovercraft background and CAA approval, is in a unique position to meet these new demands.

For more information regarding Air Vehicles' AST 300 seating system,

Circle 24 on Reader Service Card

'Call for Papers' Issued For 1994 Offshore Engineering Conference

The 13th International Conference on Offshore Mechanics and Arctic Engineering will be held February 27-March 3, 1994, at the Stouffer Presidente Hotel, Houston, Texas. The conference is administered by the American Society of Mechanical Engineers' (ASME) Off-

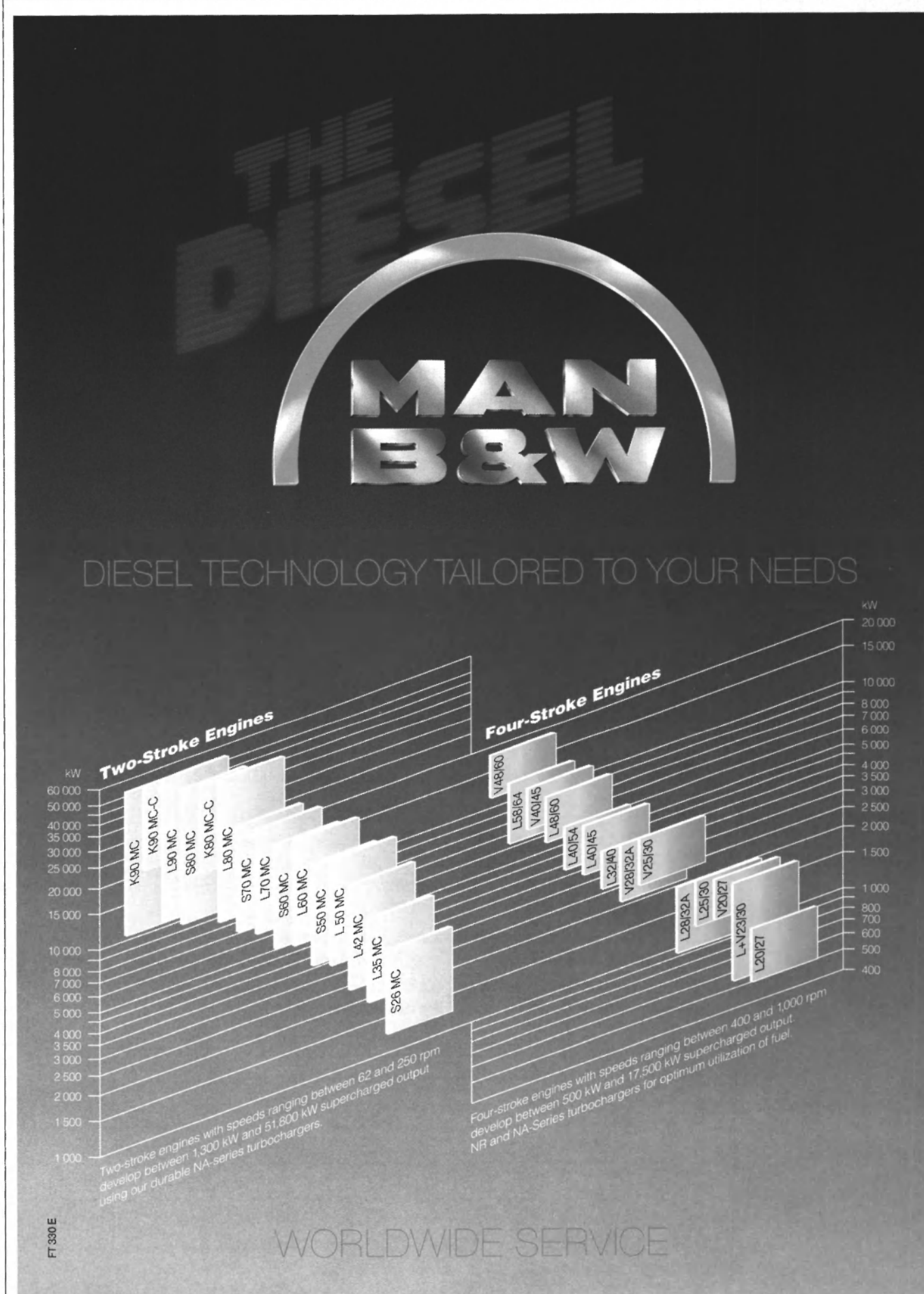
shore Mechanics and Arctic Engineering Division.

Papers are solicited in the areas of offshore technology, materials, arctic/polar technology, pipeline technology, safety and reliability. Interested authors are requested to send abstracts to: James Brekke, 1994 OMAE Conference Chairman, Exxon Production Research Co., PO Box 2189, Houston, TX 77252-2189;

Tel: 713-940-3088;
Fax: 713-940-3059.

Celebrity Signs Option For Second Ship Early

Celebrity Cruises announced that the option for the second ship in the Century Series of vessels has been taken up two months earlier than originally planned. As previously announced, Jos. Meyer GmbH & Co. will begin construction on the first ship in the Century Series in June of this year for delivery in November of 1995.



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BOATS AND BARGES

MHI's VOSREV Features A Submergible Deck To Recover Oil

Mitsubishi Heavy Industries, Ltd. (MHI) has developed a vessel named Versatile Oil Spill Response Vessel (VOSREV), initially reported in the May '93 issue of Maritime Reporter, which is designed to effectively recover and remove spilled oil from the ocean.

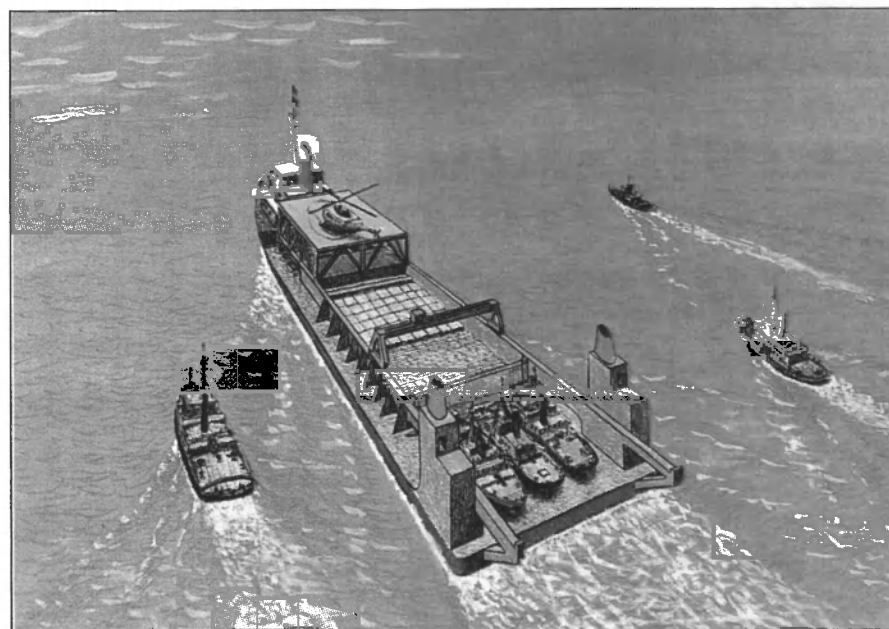
VOSREV is designed to operate in shallow coastal waters and under rough weather, satisfying various conditions required for an oil recovery vessel. VOSREV was developed by envisaging how to cope with a large-scale oil spill. The prototype will be a 10,000-dwt vessel with an overall length of 492 feet, breadth of 105 feet, depth of 28 feet and maximum draft of 20 feet. The vessel will be able to carry on its deck materials and equipment

including oil booms, oil skimmers, dispersants and smaller vessels used to deploy the fences in place.

The vessel is designed with a submergible deck. At the spill site, the small boats collect the spilled oil by sweeping it with the oil booms towards the deck of the vessel.

After collecting the oil, the vessel will store it in tanks located below the deck of the vessel, as well as manage various oil removal and collecting activities as commanding mother ship. Repeating this activity, the vessel recovers spilled oil.

In particular, the vessel will be able to collect high-viscosity, mousse-like oil, which is difficult to collect with a conventional small oil skimmer. So that VOSREV can arrive at an oil spill site as quickly as possible,



MHI's VOSREV - A vessel to recover spilled oil.

maximum speed is designed to be 16 knots. Also, the vessel will be equipped with heliport so that precise oil recovery work can be conducted through guidance from the air. VOSREV will be used as a multifunctional vessel when not in

service as an oil recovery ship. With its wide, flat deck, it will be able to carry large or heavy cargo such as special vehicles or trains.

For more information on MHI,

Circle 88 on Reader Service Card

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JJMA Division Awarded Casino Vessel Contracts

R.A. Stearn Inc., Naval Architects and Marine Engineers, a division of John J. McMullen Associates, Inc., was awarded contracts to develop plans and specifications for construction of two paddlewheel casino vessels. The Sturgeon Bay, Wis. firm is performing the work for Bender Shipbuilding & Repair Co., Inc., of Mobile, Ala.

The vessels feature hydraulically driven stern paddlewheels with two Z-drives for propulsion. The 295-foot vessels are designed for 30,000-sq.-ft. of casino space, and design is in accordance with USCG rules for Subchapter H, Passenger vessels.

Paxman Diesels Designs New High Speed Engine

Paxman Diesels, part of the GEC Alsthom Diesels Group, released details of its new high speed diesel engine, the 12VP185, which is intended to interest designers of high-speed craft.

The new design was to produce a high performance package within compact dimensions at an attractive weight and low component count.

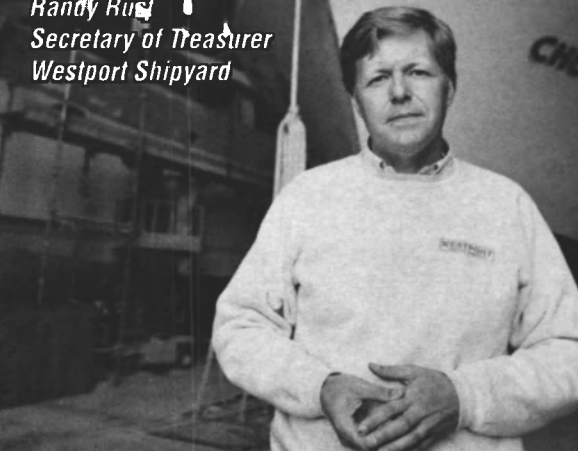
To meet dimension and weight goals a move was made to a smaller swept volume, slightly higher ratings and a review of piston speeds. The first parameter to be fixed was the stroke. This was set at 196mm, which, linked to a crankshaft speed of 1,800 rpm, gave a mean piston of 11.8 m/sec. for continuous duty. This provides an improved speed platform for marine applications, the edge of which is bounded by a maximum speed of 1,950 rpm, at which point the mean piston speed is 12.8 m/sec. In placing the new engine on the market, Paxman hopes to have addressed the key issues facing designers and operators today; namely, shrinking engine spaces, cost of ownership, obligation to meet environmental expectations and good performance and reliability.

For more information on the new Paxman engine,

Circle 83 on Reader Service Card

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Randy Rust
Secretary of Treasurer
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Craig Pankow,
Stanley T. Scott & Co.
(206) 323-3931

Circle 197 on Reader Service Card

Vessel Tracking Systems

(Continued from page 123)

way. Each port zone contains between one and ten subzones. There are a total of 99 subzones. The Coast Guard is using a benefit/cost analysis to determine which subzones (or portions of subzones) to monitor with remote sensors.

Regarding benefits, the Coast Guard is developing estimates using the computer model developed for the *Port Needs Study*. Although the study used this model to calculate the benefits of a VTS system for entire port zones, the model can also be used to estimate benefits by subzone.

Regarding costs, estimates are based on the cost of a Vessel Tracking Center (VTC), the cost of equipment to monitor the subzone(s) (i.e., remote sensors, communications equipment, and other equipment), and operation and maintenance costs. Coast Guard officials said that the cost of a VTC makes up a substantial portion of the total cost of a VTS system and is not significantly affected by the number of subzones being monitored.

The Coast Guard has decided that Vessel Tracking Systems should achieve as close to a zero-accident rate as possible under normal circumstances and conditions in the areas being monitored.


Officials also said that the VTS

systems are being designed to function adequately under most circumstances likely to be encountered in the particular area being monitored. For example, in ports where heavy rain is common, a radar system would be used that could operate adequately in heavy rain. However in ports where heavy rain is rare and/or vessels do not typically operate in such weather, a radar with out that capability would be used. Officials also said that in certain areas that are particularly dangerous, redundant coverage (e.g., the use of two radars to monitor a single area in case one radar becomes inoperative) may be appropriate. They added, however, that in most cases redundant coverage would be excessive.

The Coast Guard's actions in selecting ports for establishing or improving VTS systems are consistent with the *Port Needs Study*. Ninety-one percent of the \$26.8 million it requested for fiscal year 1993 to establish or improve VTS systems was requested for VTS 2000. The Coast Guard is using a benefit/cost approach to determine the specific areas of port zones to be monitored by the VTS systems it is establishing under VTS 2000.

Copies of the *Port Needs Study* may be obtained from the General Accounting Office, Washington, D.C.

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Circle 198 on Reader Service Card

Maritime Reporter/Engineering News

IMS Issues New Rules regulating Platform removal

As the major oil companies attempt to sell their Gulf of Mexico assets to independent operators, the federal government has activated rules requiring the new operators to post cash or cash equivalent collateral with the government to insure ultimate platform removal and site remediation.

Haunted by the spectre of bankrupt companies' derelict platforms remaining indefinitely on inactive fields, the Minerals Management Service (MMS) of the Department of the Interior can and has blocked the sale of certain properties if the buyer is not of a sufficient size, or does not have sufficient collateral in place, to insure removal of the platform after production ceases.

Appropriate collateral is deemed to be a cash escrow account, a pool of government securities, a performance and payment bond, or, in the case of larger companies, self insurance equal to the anticipated cost.

The use of an appropriate performance bond or contractor guarantee provided by one of the larger marine contractors is one way to solve the impasse, according to **Eric Smith** of McDermott, Inc. Large offshore contractors, who are not typically working interest owners or operators of offshore oil or gas fields, can use their financial strength to satisfy the government requirement, supporting the transfer of the lease and helping to break up the log jams at MMS.

Marine Travelift Boat Hoist Features Four Hoist Winch Design

The new 88BFM Mobile Boat Hoist from Marine Travelift boasts new design features, longer service life and less downtime, the manufacturer claims.

The new features include a redesigned pivot trunnion with replaceable bushings, newly designed, large diameter hoist drums that assure uniform cable spooling for long life, as well as smooth hoisting action,

new direct drive hoists and sling-adjustment track to reduce maintenance. For more information on Marine Travelift,

Circle 26 on Reader Service Card

SNAME Prepares For Centennial Celebration

The Society of Naval Architects and Marine Engineers (SNAME) will hold its Centennial Meeting celebration on September 14-19, 1993, at The New York Hilton and Towers, in New York City.

This celebration of SNAME's 100th birthday will be composed of many activities, including a technical and social program. Two books - one a comprehensive historical treatise covering the past 50 years of the marine industry, and the other chronicling 100 years of activities of the Society - are being prepared for distribution at the meeting. The International Maritime Exposition will be held concurrently with the Centennial Meeting.

New Munson Catalog Displays Range Of Aluminum Workboats

Demonstrating that Munson Manufacturing has models and configurations for virtually any purpose, the Volume 12 Munson catalog of aluminum work boats is now available.

With a new, full color format, the 72-page catalog features Munson's Hammerhead, Hammercat and Seasled lines.

Munson Manufacturing offers a full line of industrial and utility vessels, including emergency response, oil pollution control, passenger, pilot, cargo, dive, survey, patrol and fishing vessels. These models are available in lengths from 21- to 72-feet and can be outfitted in a wide variety of ways.

For a copy of the newest Munson Manufacturing catalog,

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June, 1993

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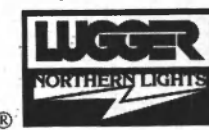
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Circle 181 on Reader Service Card

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PROPULSION UPDATE

Westinghouse Marine Division To Supply Sealift Propulsion System Components

Westinghouse's Marine Div. in Sunnyvale, Calif. has made a committed entry into the U.S. Navy's Strategic Sealift propulsion market by positioning itself to supply propulsion components as well as complete propulsion systems.

Westinghouse officials said the company is making this long-term commitment to meet the future requirements of its propulsion customers by teaming with several of the world's leading marine propulsion component suppliers and by choosing New Orleans, La., as the site for a new state-of-the-art diesel engine assembly and test facility.

"These agreements and the new assembly and test facility position Westinghouse as a high-quality U.S. source for propulsion components and complete propulsion systems, including diesel engines, reduction gears, line shafting and controllable pitch propellers," said **Jack Orme**, Westinghouse Marine Div. Diesel Propulsion manager. "And these capabilities allow us to help shipyards be more competitive."

Westinghouse has teamed with New Sulzer Diesel Ltd. of Winterthur, Switzerland to market and manufacture low-and medium-speed diesel engines in the U.S., and with Sulzer Escher Wyss of Ravensburg, Germany, for controllable pitch propellers. Westinghouse will supply reduction gears from its Sunnyvale facility. The agreement with Sulzer Escher Wyss also includes Jorgensen Forge of Seattle, Wash., an experienced source for the forging and machining of shafts, shaftline components and other equipment.

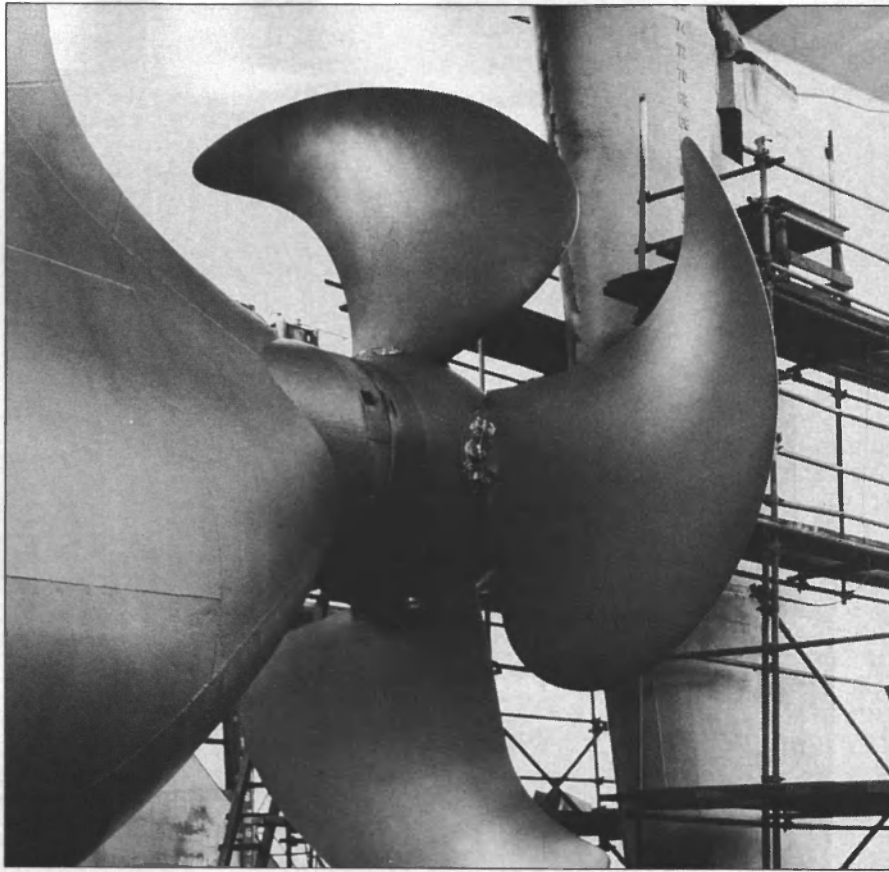
Westinghouse is a world-class designer and manufacturer of com-

plete ship propulsion systems, and in recent years has been selected by the U.S. Navy to design, develop and produce the next generation of efficient gas turbine engines for navy surface combatant ships, as well as the advanced propulsion systems for its two most recent submarines, the Los Angeles and Seawolf classes. In addition, Westinghouse-built reduction gears drive more than 100 Navy ships, including destroyers and cruisers. The company has designed and manufactured propulsion turbines, reduction gear sets, control systems and turbine generator sets for ship electrical service for most of the century.

"These systems offer high reliability, long intervals between overhauls and low fuel oil consumption, which translates into low operating costs," said Mr. **Orme**. "Operators will reduce long-term costs as well when factors such as system reliability and operating life are taken into account."

Westinghouse plans to manufacture major components such as cylinder liners, pistons, rods, heads, valves and other equipment for these engines in its Sunnyvale, Calif. facility, and assemble and test the completed diesel engine system at a new 200,000-sq.-ft. diesel marine propulsion assembly and test facility in New Orleans. The new facility is scheduled to become operational in early 1995, in time to meet delivery requirements for new construction Sealift ships.

"This facility makes it possible for complete low-and medium-speed diesel engines to be delivered by barge directly to shipyards without the need for extensive disassembly and reassembly," Mr. **Orme** said.



Westinghouse intends to market and manufacture controllable pitch propellers such as this Escher Wyss model.

"This new site provides a major advantage to shipyards because it significantly reduces the number of man hours required to build and deliver a marine diesel engine, which would otherwise be shipped by rail or truck. On a low-speed engine alone, the waterfront facility will save thousands of man hours," in turn providing cost and schedule benefits to customers.

For medium-speed diesel engines and gas turbine applications, Westinghouse will supply reduction gears, shafting and controllable pitch propellers. Westinghouse has an 80-year history in marine reduction gear manufacturing. The company has off-the-shelf designs for double-input medium-speed diesel reduction gears and a single input LM2500 gas turbine reduction gear; more than 125 Westinghouse reduction gears for LM2500's are in

service or have been delivered.

To complete the package, Westinghouse announced in February an agreement with Sulzer Escher Wyss for Westinghouse to market and manufacture large, high-horsepower controllable pitch propellers in the U.S. for Sealift and other Navy ships. Sulzer Escher Wyss is a leading designer of controllable pitch propellers, with more than 1,800 Escher Wyss propellers in service worldwide, including a 46,000 horsepower controllable pitch propeller.

Westinghouse/Escher Wyss controllable pitch propellers will be capable of propelling ships up to 50,000 hp per propeller shaft.

For more information on Westinghouse marine products and services,

Circle 10 on Reader Service Card

BBC Turbochargers Renamed ABB Turbochargers

Five years ago Brown Boveri & Co. Ltd. (BBC) of Switzerland merged with Asea of Sweden to form ABB Asea Brown Boveri, a new group comprised of some 1,300 individual companies.

The former BBC turbocharger department became ABB Turbo Systems Ltd., while its product retained the name BBC Turbocharger due to the worldwide reputation it had gained since being launched 65 years earlier.

As of spring 1993, BBC Turbochargers will be named ABB Turbochargers, as the company has deemed the market has had sufficient time to get used to the name ABB.

As an expression of Group corpo-

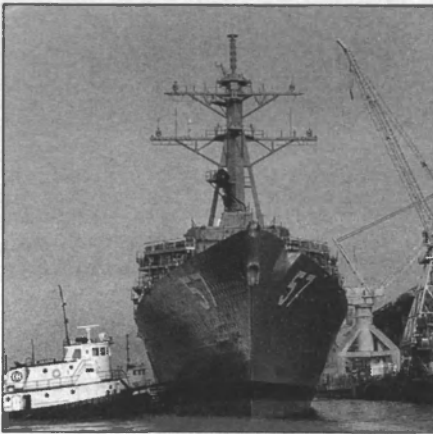
rate identity, ABB Turbo Systems' complete product range will be marketed as ABB products.

For more information on ABB Turbo Systems Ltd. products and services,

Circle 60 on Reader Service Card

Ingalls Launches Third Aegis Destroyer

DDG 57, the third U.S. Navy Aegis guided missile destroyer to be built by Ingalls Shipbuilding division of Litton in Pascagoula, Miss., was launched in May in preparation for a christening at Ingalls later in the month. The vessel was christened "Mitscher."



Ingalls-built Mitscher

New L.A. Coal Terminal Built For Japanese Exports

An agreement has been signed

between U.S. and Japanese companies to build a new coal loading terminal in the Port of Los Angeles in anticipation of U.S. coal exports to Japan.

The U.S. will have a 51 percent stake in the project to ship approximately 10 million tons of Utah and Colorado coal to Japan through the new terminal each year.

The remaining 49 percent of the agreement will consist of several Japanese corporations, along with the Bank of Japan, who will import the coal for power generation.

According to industry sources, a major motivation for the agreement was to help ease friction between both countries over their longstanding trade imbalance.

The Japanese currently import coal from China and Australia, but are interested in diversifying their sources.

Maritime Reporter/Engineering News

JUNE

AAPAPort Operations Seminar:
June 9-11, Jacksonville, Fla.
Marriott at Sawgrass. Contact:
American Association of Port Au-
thorities at (703) 684-5700.

International Submarine Races:
June 16-27, Ft. Lauderdale, Fla.
Contact: International Submarine
Races, 1515 W. Commercial Blvd.,
Ft. Lauderdale, Fla. 33309; tel: (305)
351-4175; fax: (305) 351-4176.

JULY

Maritime Communications and Control: July 7-8, London
Contact: **Rhian Bufton**, conference organizer, The Institute of Marine Engineers, The Memorial Building, 76 Mark Lane, London

AUGUST

Offshore Northern Seas Conference & Exhibition: August 23-26, Stavanger, Norway
Contact: Offshore Northern Seas '94,
P.O. Box 410, N-4001 Stavanger,
Norway; Tel: +47 4 55 81 00; Fax:
+47 4 55 10 15.

SEPTEMBER

SNAME Centennial Annual Meeting and International Maritime Exposition: September 14-19, New York
New York Hilton Hotel. Contact: The Society of Naval Architects and Marine Engineers, 601 Pavonia Ave., Jersey City, N.J. 07306. tel: (201) 798-4800; fax: (201) 798-4975.

Offshore Europe '93: September 7-10, Scotland
Aberdeen Exhibition & Conference
Center: Contact: Offshore Europe Partnership, Rowe House, 55/59 Fife Road, Kingston upon Thames, Surrey KT1 1TA; tel: +44 81 549 5831; fax: +44 81 541 5657/974 8077.

NEVA '93—The International Shipping Exhibition: September 14-18, St. Petersburg, Russia
Contact: **Roderick Keay**, Dolphin Exhibitions Ltd., 112 High St., Bildeston, Suffolk IP77EB England; tel: +44 9 741087; fax: +44 9 741628.

nies (U.K.), Oriel House, 26 The Quadrant, Richmond-on-Thames, Surrey, U.K. TW9 1DL; tel: +44 81 948 9800; fax: +44 81 948 9870.

National Waterways Conference: September 22-24, Memphis, Tenn.
Contact: National Waterways Conference, Inc., 1130 17th St., N.W., Washington, D.C. 20036-4676; tel: (202) 296-4415; fax: (202) 835-3861.

Tanker Industry Convention:
September 27-29, London, U.K.
Royal Lancaster Hotel. Contact:
Vanessa Stephens, The Seatrade
Organization, Seatrade House, 42-
48 North Station Road, Colchester
CO1 1RB, U.K.; tel: +44 206 45121;
fax: +44 206 45190.

82nd Annual AAPA Convention:
Sept. 27-Oct. 1, Halifax, Nova Scotia
The Prince George Hotel and Cha-
teau Halifax. Contact: American
Association of Port Authorities at
(703) 684-5700.

OCTOBER

International Offshore Contracting & Subsea Engineering: October 13-16, Aberdeen, U.K. Aberdeen Exhibition & Conference Center. Contact: Spearhead Exhibitions, Ltd., **Judith Patten**, Neville House, 55 Eden St., Kingston upon Thames, Surrey KT1 1BW; tel: +44 81 547 1566; fax: +44 81 547 1143.

West European Cooperation in Marine Technology (WEMT'93):
October 20-22, Madrid
"Ship Production and Ship Procurement" conference. Contact: **Juan Pablo Merino**; tel: 34-1-448 4301; fax: 34-1-446 0198.

NOVEMBER

NSRP Ship Production Symposium: November 1-4, Williamsburg, Va.
Contact: NSRP Ship Production Symposium, UMTRI, Marine Systems Division, 2901 Baxter Road, Ann Arbor, Mich. 48109-2150; fax: (313) 936-1081.

Ship Repair & Conversion '93:
November 9-10, London, England
Contact: **John Gwynn-Jones**,
BML Business Meetings Ltd., 2 Station
Road, Rickmansworth, Herts
WD3 1QP, England; Tel: +44 923
776363; Fax: +44 923 777206.

Brunsvoll Tunnel Thruster Passes Muster On John P. Tully Sea Trials

Ship's Aid International Ltd., sales and service agents for Brunvoll A.S., of Norway, announced the completion of sea trials for a newly installed thruster unit on the John P. Tully, a research vessel with the Institute of Ocean Sciences in Victoria, British Columbia.

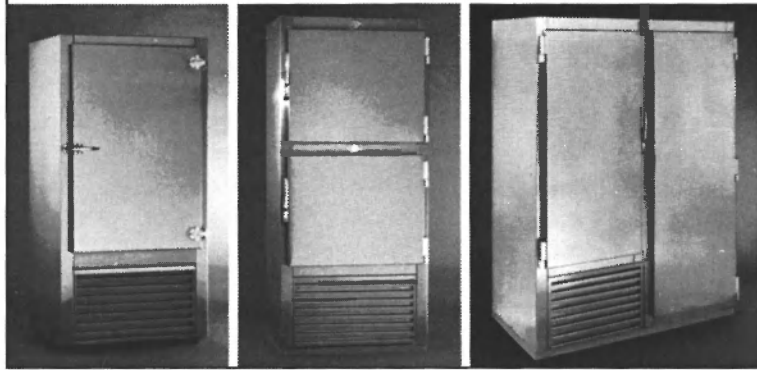
The Brunvoll tunnel thruster replaced an older and less powerful water jet thruster, and has allowed for increased maneuverability for the vessel while docking and undocking and positioning itself for research work.

Point Hope Shipyard Co. Ltd. was awarded the contract to remove the old unit and install and wire the new thruster. The work was completed in a three-week period.

For more information on Ship's Aid International Ltd.,

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Circle 257 on Reader Service Card

June, 1993

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IDB's Klein Touts Cost Effectiveness, Improved Service As Benefits Of IDB/AMSC Agreement

As shipowners increasingly eye their bottom lines, IDB Mobile Communications, Inc. president **Jon Klein** heralds his company and its recent moves as a significant step in helping to improve shipboard communications quality while simultaneously driving down prices.

IDB Mobile, as reported in the May 1993 issue of Maritime Reporter, signed a Value Added Service Provider agreement with American Mobile Satellite Corp. (AMSC), whereby IDB will provide up to 10 million minutes of enhanced voice and data communications services to maritime markets utilizing AMSC's mobile satellite service. According to Mr. Klein, the bottom-line meaning of the agreement is that users will have more flexibility, as he says the voice-oriented AMSC can be seen as an alternative to Inmarsat. While AMSC has limited range (see chart of AMSC Projected Service Map), "the AMSC footprint is extensive and within it users can enjoy dramatically lower costs of equipment and services," Mr. Klein added. "If you look at the AMSC footprint, you realize that a lot of ships never leave that area."

To illustrate his point, Mr. Klein said that maritime customers tran-

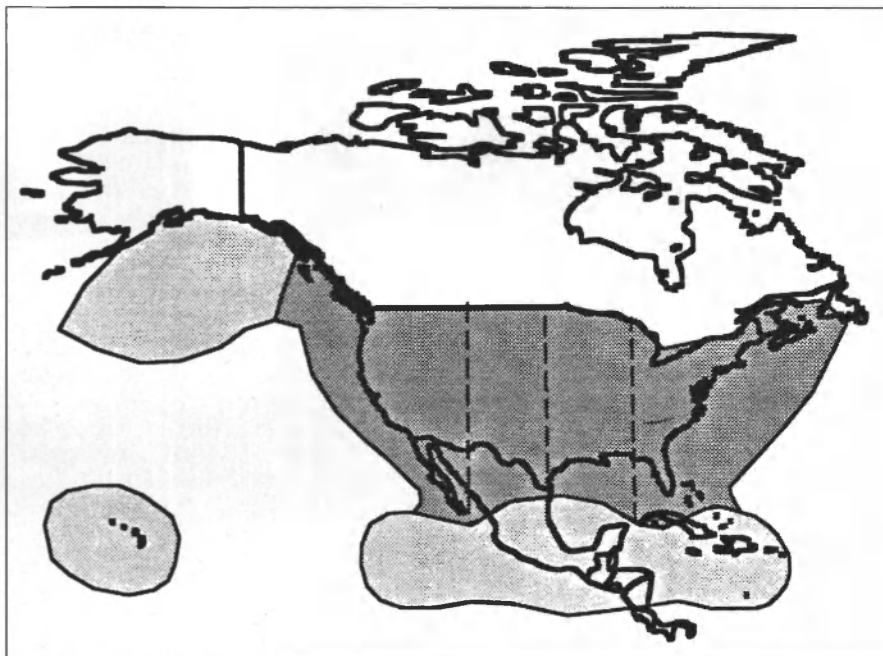
siting the AMSC service area will be able to make calls for between \$2 and \$3.50 per minute, compared to the higher prices currently available through other services.

Per call cost is not the only area in which customers can save. According to Mr. Klein, the cost of an Inmarsat M terminal is \$24,000, where the cost for an AMSC terminal will range between \$3,000 and \$4,000. "I'm trying to make sure that our customers and your readers know that there is going to be another service," said Mr. Klein. AMSC service is scheduled to begin in the second half of 1994.

Neither Inmarsat M nor the AMSC service, both voice-oriented services, are designed to replace Inmarsat A, but rather to supplement it. Mr. Klein envisions AMSC service as a complimentary system to larger vessels, so they can enjoy less expensive voice communications in the AMSC service zone. IDB also anticipates offering automatic switching so that ships using voice communication in the AMSC footprint are automatically switched to the less expensive service.

But the big market potential perhaps lies in the smaller vessels. According to Mr. Klein, there are

Projected AMSC Service Map Land Mobile/Maritime



more than 50,000 35-foot plus fishing boats and more than 30,000 30-foot plus yachts which are potential users of the service. "The market for yachts and fishing vessels is incredible...AMSC will expand the base of mobile maritime communication tremendously," said Mr. Klein. As for signal quality, Mr. Klein admits there is little difference between the AMSC and Inmarsat M service (which IDB also markets). Where the difference lies is in the actual satellite: The immense powerful MSAT satellite to

be used for the AMSC service allows the size of the terminals and the antenna ("the size of a serving plate" said Mr. Klein) to be much more compact, thus more accessible to a variety of users. IDB Mobile markets maritime and land mobile satellite communications services to users including commercial shipping fleets, fishing vessels, pleasure cruises, oil rigs and tankers and remote land operations. For more information on IDB Mobile,

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Skarpenord Data To Launch New Generation Of Tank Level Gauging Systems

Skarpenord Data of Langesund, Norway, will release a new generation of the Level Gauging System Cargomaster®. The new system will be called Cargomaster® V4.

Cargomaster V4 can be delivered with either pressure-type or radar beam-type sensors, or both in combination, to measure tank level in cargo and slop tanks. Depending on the tank shape and type of cargo, Skarpenord Data will be able to advise the customer to select the optimum sensor type.

According to Skarpenord Data, the pressure sensor P105 for submerged installation has been improved in both reliability and accuracy. The company says the modified version gives a completely maintenance free operation and the overall accuracy is within +/- .31 inches of water gauge.

The interface electronics of Cargomaster V4 are placed in a small cabinet in the cargo control room. The hardware is modularized, with a capacity of 8 tanks per module. Fully equipped, one cabinet has a total capacity of 56 tanks with level, temperature, IGP and density measurement, or up to 250 tanks for pure level gauging.

For more information on Skarpenord Data,

Circle 73 on Reader Service Card

APL To Order Additional Prototypes Of Containers

American President Lines' (APL) Stacktrain Services has placed an order for 19 additional prototypes of the 53-foot containers it is jointly developing with Transamerica Leasing for the domestic transportation market. According to the company, the initial prototype unit is resulting in improved shipping and loading productivity and has reportedly been well received by shippers of low-density products.

Unlike other existing designs, the container can reportedly be interchanged from one user or transportation provider or mode to another, resulting in increased operating flexibility.

Gar-Dur Plastic Aids Maritime Industry

Gar-Dur® ultra-high molecular weight (UHMW) high-impact plastic can be used to replace wooden and rubber bumpers in shipping ports and ferry slips. These Gar-Dur "boards" have a very low coefficient of friction and a high impact strength reportedly make them excellent for stopping and/or guiding the vessel without damage to the vessel or to its pier/wharf.

The special plastic is effective in the sub-zero climates of many winter port areas because it will not

chip or break off in low temperatures, the manufacturer claims.

In addition, the material reportedly will not absorb fluids such as water, grease or any of the other fluids normally found in port areas. The company claims it will never rust or deteriorate. And materials such as seaweed, barnacles, dirt, etc. will not adhere to the Gar-Dur. This means that the plastic "boards" will outlast wooden and rubber ones by many years. This, of course, minimizes repairs and downtime.

Gar-Dur is an industrial-grade UHMW plastic from the plastics division of Garland Manufacturing Co.

For more information on Gar-Dur high impact plastic,

Circle 36 on Reader Service Card

Oxygen-Sensing Gauging Tape Increases Vessel Safety

MMC International Corporation now makes available a portable, battery-operated gauging tape that provides a way to check the oxygen level within a closed tank.

This new instrument, known as a Flexi-Dip™ Oxygen Sensor Gauging Tape, reportedly provides this information swiftly, safely and accurately via large-character digital readout on the hub face plate. All that is required is a tight connection to an MMC vapor-control valve mounted on top of the tank. The data is transmitted from a sensor that descends into the ullage space.

This information is essential for petroleum-carrying vessels using an inert gas blanket within their cargo tanks, which must monitor the oxygen content to make sure that the inert gas system is operating properly.

MagneTek Wins Transformer Contract From Ingalls

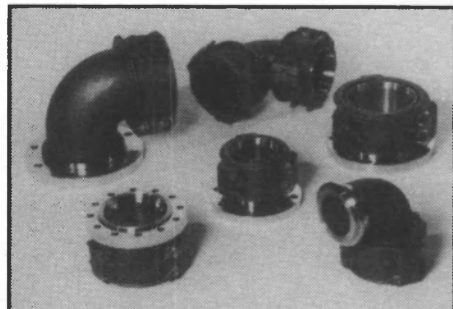
MagneTek has been awarded a new contract from Ingalls Shipbuilding Division of Litton Industries to provide transformers for the multi-purpose amphibious assault BATTAN ship (LHD 5). Ingalls also maintains options with MagneTek to supply transformers for LHD 6 and 7. In addition to manufacturing a broad line of standard distribution transformers, MagneTek is a leader in non-linear-load transformer technology, providing custom-designed phase shifting and K-factor transformers to companies and agencies worldwide. The company's QPL Jefferson-type and Crittenden-type transformers are Navy standard. Recently introduced is a family of marine-duty transformers which meet the unique requirements of commercial maritime applications. MagneTek's power magnetics manufacturing facility is located in Gardena, Calif.

For more on MagneTek,

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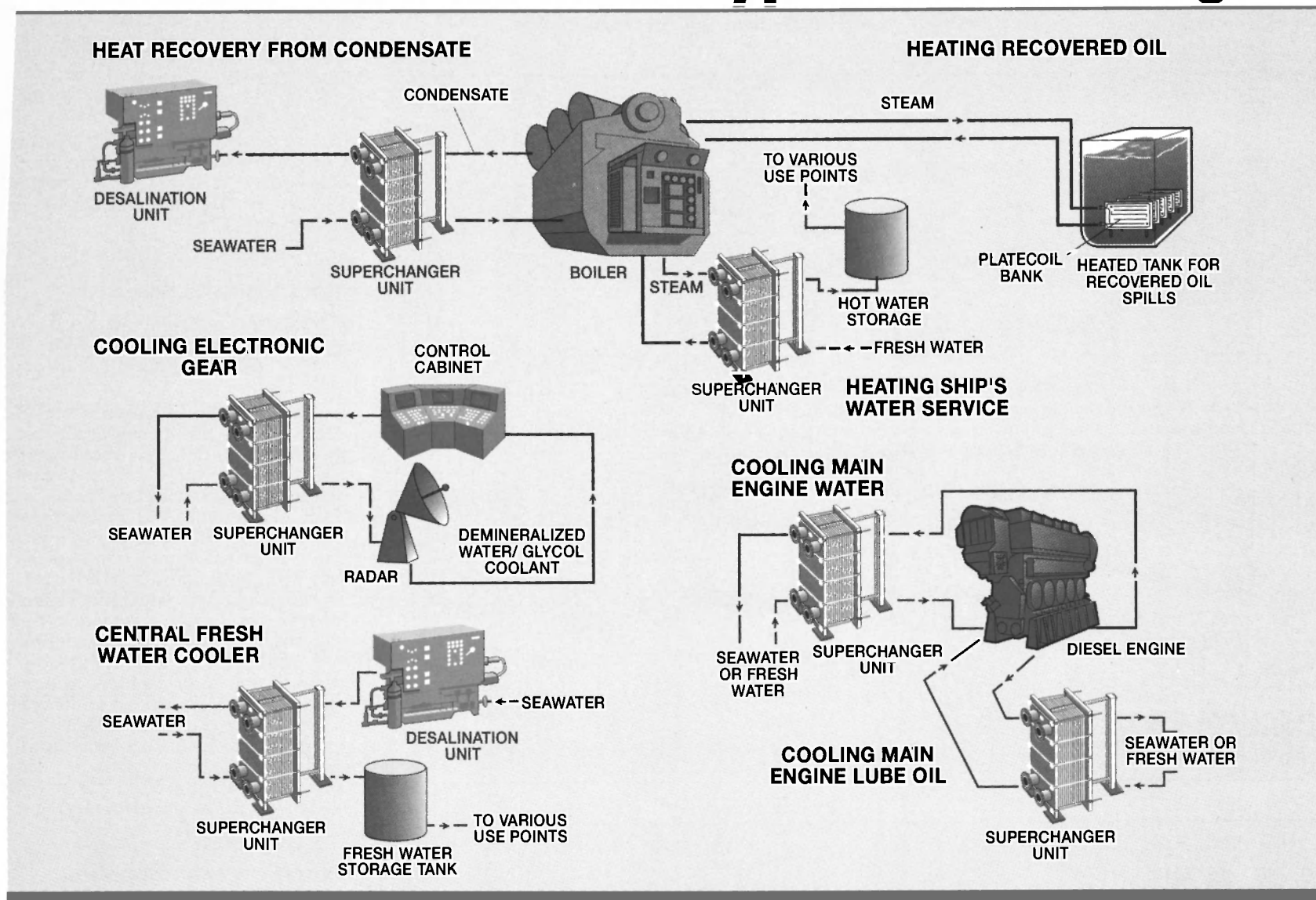


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How to Operate More Efficiently At Lower Cost With Tranter Plate-type Heat Exchangers



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Circle 306 on Reader Service Card

IMO Lists Numerous Ships Detained By Authorities

In a report made available to the public, the International Maritime Organization (IMO) listed 220 ships that were detained by port state control authorities for varied reasons - including deficiencies to life-saving, fire-fighting and communication

equipment as well as structural deficiencies.

The report has been made available to the meeting taking place at the IMO's London headquarters, whereas in the past the report went to the Maritime Safety Committee.

The annual exercise carried out by the IMO has taken on greater importance since it took steps to put flag states and classification societies under closer scrutiny.

Sixty-four bulkers were included

in the list, while tankers accounted for only 15 of the ships. Half of the ships held were from open registers. Panama led the group with 31 ships detained, Cyprus with 26 and Malta with 13.

National flags also figured prominently. Fifteen Turkish-flag ships were detained, which leads one to question the effectiveness of the Turkish administration at a time when the country's fleet is reportedly growing.

MarAd Accepts Bids From Ever-Glitter And Chenco For Vessels

The Maritime Administration has accepted bids for six vessels which were offered for sale for scrapping under Invitation for Bids No. EXC 8626.

Ever-Glitter International Ltd New York, N.Y. was the successful bidder on the following: Adelphi Victory \$361,205.05; Barre Victory 370,534.63; Mayfield Victory 357,236.35; St. Augustine Victory 367,561.10.

MarAd also accepted a bid from Chenco International Inc., Puyallup, Wash. for the following: Hamilton Victory \$421,118.00; Muhlenberg Victory 404,918.00.

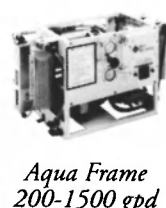
Massachusetts Maritime Academy Installs Oil Spill Simulator

Under leadership of president R. Adm. Peter H. Cressy and Commodore Motte, the Massachusetts Maritime Academy recently completed the construction of an Oil Spill Management Simulator, reportedly the only one of its kind in the U.S. at this time. This laboratory will further enhance the hands-on training of its cadets, seasoned Masters, experienced mariners and oil/petroleum company's executives and staffs, in implementing emergency response procedures and operational tactics in the handling of oil spills anywhere in the world.

The addition of this new training laboratory compliments the Academy's Bridge Simulator and Radar Simulator laboratories.

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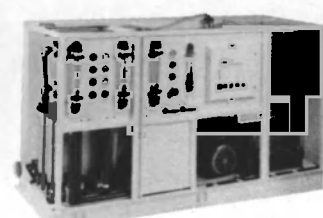
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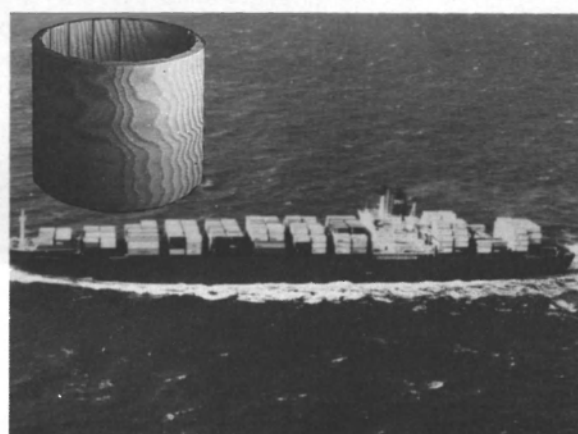
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Skandiaverken Supplies B&W Engine Parts, Service

Skandiaverken Trading is an independent supplier of spare parts for the B&W type 23 and 28 engines. They keep a complete range of spare parts on stock and deliver directly from their warehouse in Lysekil on the west coast of Sweden. Orders placed before 10 a.m. can be delivered at all major airports in less than 24 hours.

For more information on Skandiaverken Trading

Circle 38 on Reader Service Card

Volvo Delivers First Marine Gen Set System

The first prototypes of Volvo Penta's Marine Gen Set System, used to re-equip the 1,418 gt passenger ship "Wilhelmshaven," were delivered.

The contract was placed with Volvo Penta Deutschland, in conjunction with H. Petzelberger, its dealer in the Ostfriesland region of North Germany.

EDITORIAL

The U.S. Coast Guard: Moving Into A Changing Era

By Admiral J. William Kime, USCG

It would be extremely myopic on my part to speak of the Coast Guard in the past year and its directions in the near future without mention of the world events that have, and will continue to, affect it. If 1992 could be reduced to a single word, it would be "change." From the emerging nations of the crumbled Soviet Union, to the rumblings for democracy from the Caribbean, to the advent of a new administration here in the U.S., people and policies are changing.

The multi-missioned flexibility of the Coast Guard has served us well in absorbing the impact of this rapid change, while retaining our trademark poise and professionalism.

Let me give you an example. On an average Coast Guard day in the past year, 12 lives and \$2 million in property were saved. Another 315 people were assisted, 144 search and rescue cases were conducted and more than 90 large vessels were boarded for port safety checks. And just to keep everyone on track, 150 aids to navigation were serviced.

Yet, within a few days after receiving orders for their new mission, these same people, planes and cutters that provided these services were in place off the coast of Haiti. They effectively prevented another wave of economic migrants from taking to the high seas and risking their lives this past January.

This brings me to our most important and impressive resource - our people. In keeping with the Coast Guard's historic humanitarian role of helping the maritime public, a new set of customers has been added - Coast Guard members and their families. As I have stated, our people are the very core of the Coast Guard. In response to our service-wide Work Life Study, programs are being initiated to bring the needs of our people to the forefront. Our aim is to help them deal with or solve life problems that impact their performance and their quality of life. As a possible upshot of this emphasis, I am happy to report we have an all time high re-enlistment rate and the most highly-trained force of multi-skilled professionals that I have had the opportunity to serve with during my 36 year career.

General Colin Powell, chairman of the Joint Chiefs of Staff, commented recently that "the Coast Guard's national security functions will evolve with the emerging requirements of the post cold war era."

Both the Department of Defense and the Coast Guard are realizing that national security is now a broadened term that not only encompasses national defense, but also the economic, social and environmental well-being of the nation. In coming to realize this expanded definition of national security, the Coast Guard is uniquely qualified to take on the task.

Although we are one of the nation's five armed forces, our missions extend beyond the traditional role of national defense. We also emphasize our roles in providing Maritime Safety, Maritime Law Enforcement and Marine Environmental Protection. These distinct roles provide our nation with expertise not duplicated by the other armed forces. I will elaborate on them since it is these areas that distinguish the Coast Guard as a unique service with incomparable capabilities, rather than as a small, second best Navy.

The safe movement of marine cargoes and people, the protection of marine resources and the marine environment, and the enforcement of U.S. laws and treaties are becoming increasingly important. Our interdependent global economy makes it critical that the U.S. have an effective maritime transportation system.

Toward that goal, we have several acquisition projects that are underway. In February of this year, we contracted for the first of the new JUNIPER class of seagoing buoy tenders and we anticipate awarding a contract for smaller coastal tenders later this year. These will replace our aging fleet of tenders that are in some cases over 50 years old. Likewise, they will provide additional help in the marine environmental role as they will have the capability for spilled oil recovery. The ongoing acquisition and testing of five 47-foot motor lifeboats to replace our aging 44-footers is going well. I have seen the first of the new boats and their performance has been truly impressive.

Safe and efficient use of the nation's ports is as vital to a strong and healthy economy as it is to the resupply of a deployed military force. Improvements we are making this year in our vessel traffic services and the differential global positioning system (GPS) will make these services increasingly important while greatly adding to the safety of these vital supply lines. A new system of differential GPS navigation for harbor approach and coastal piloting is planned for installation by 1996 and envisions an all-weather navigational accuracy of better than 33 feet.

The federal government's planning for and response to natural disasters is certainly an important and topical issue. After Hurricane Andrew struck the Florida and Louisiana coasts and Hurricane Iniki hit Hawaii, the Coast Guard was a key participant in relief operations. We assessed damage to our ports and waterways, rescued many people whose lives were threatened, provided logistics support for other federal agencies, and assisted with the restoration of maritime commerce after the storms. I was especially

proud of the dedication displayed by our people in the area who experienced first hand the devastation and loss that hurricanes cause. Yet, they unselfishly put aside their own concerns and came to the aid of others. Because of this type of spirit, we were able to perform these missions successfully. We quickly dispatched people and equipment from around the nation to augment Coast Guard and federal forces within the affected areas. The Coast Guard is recognized as the nation's premier and oldest at-sea enforcement agency. Its vital role in this capacity supports the stated National Security Strategy objective of: "... a free and independent nation, with its fundamental values intact and its institutions and people secure."

Operating in U.S. waters, in the Exclusive Economic Zone, on the high seas, and by invitation in the territorial seas of other nations, the Coast Guard enforces all U.S. laws and treaties. We support national security objectives by reducing the flow of illicit drugs and other contraband, interdicting illegal migrants, protecting fisheries and marine resources. We combat maritime terrorism and provide naval commanders the capability for maritime interception operations.

There is certainly no more relevant example of this than the Coast Guard's ongoing effort as the primary maritime participant in the humanitarian interception at sea and eventual repatriation of Haitians fleeing the economic conditions of their country. Between November of 1991 and this last January, the Coast Guard rescued more than 40,000 Haitians, most of them at sea in overcrowded and unseaworthy boats. These operations required a massive, coordinated effort involving numerous ships and aircraft. This prompted me to initiate operation Able Manner which created a large safety net of cutters and naval vessels off Haiti and has also acted as a very effective deterrent to the threat of mass exodus near Inauguration Day this last January. In addition, we are also rescuing and interdicting increasing numbers of Cuban refugees and Chinese migrants.

The motor vessel EAST WOOD was recently intercepted by the Coast Guard about 1,500 miles west of Hawaii with 527 illegal, malnourished, sick, economic migrants coming from the People's Republic of China.

Due to some tremendous coordination by the Coast Guard Pacific Area Command, the 14th District and those working here in Washington, and working with governments in the Marshall Islands, Panama, Hong Kong and the People's Republic of China, these people have now been safely repatriated.



Overall, our mission of intercepting illegal migrants appears to be a growing one.

Maritime drug interdiction remains an important mission. Last fiscal year Coast Guard cutters and law enforcement detachments conducted over 26,000 vessel boardings. During that time the Coast Guard seized or assisted with the seizure of more than 48,000 pounds of cocaine and 116,000 pounds of marijuana for an estimated street value in contraband narcotics totaling over \$2.8 billion.

Besides search and rescue and marine environmental concerns, we are working with many countries throughout the world to help those governments in the source and transit countries to suppress drug production and trafficking. Our international training teams provided law enforcement training to 637 students in 31 countries last year. Since 1987, we have provided 20 ex-USCG patrol craft to nine countries. By providing equipment, personnel and training in this endeavor we gain additional valuable resources because of the force multiplier effect. Perhaps just as importantly, the U.S. and the Coast Guard often gain trusted friends and allies.

The Marine Environmental Protection role certainly contributes to the national objective of a healthy environment through an aggressive prevention, enforcement and response program.

Our involvement in protecting living marine resources is intensifying as the need to manage U.S. fisheries resources becomes more critical. You may have heard this referred to in the past as simply "fisheries." But, it has now taken the broadened term of "Living Marine Resources Enforcement." This includes marine mammals, endangered marine species and habitat protection. The enforcement of increasingly complex regulations has required the shifting of our limited resources. We increased our capability in the Pacific by moving two high-endurance cutters to that area and supplemented the aircraft available for surveillance duty. Our long range C-130 patrol aircraft have had high-tech, DOD generated, surveillance radars added to further

(Continued on page 143)

Homeport Marine Delivers Shelter Deck Stern Trawler



The Arctic VI shelter deck stern trawler.

Homeport Marine Services, Moss Point, Miss., announced the delivery of the Arctic VI, a shelter deck stern trawler. The vessel is owned by Arctic Alaska Fisheries, Inc. of Seattle, Wash. Upon delivery, the Arctic VI departed for the Bering Sea via Seattle where she will fish for pollock and deliver her 150-ton

catch to a factory ship for processing into Surimi and fresh frozen fillets. The Arctic VI is 124 feet long, 30 feet wide and 24 feet deep with two 3,100-cubic-foot refrigerated sea water hold tanks. The vessel has a crew of six. She will carry 40,000 gallons of fuel and 6,000 gallons of fresh water. The Arctic VI was built

to ABS requirements and carries an American Bureau of Shipping Loadline Certificate. The vessel is propelled by two Caterpillar 3508 main engines developing 960 hp each, turning five bladed propellers in Kort nozzles. Electrical power is supplied by one 715 kW and one 400 kW Caterpillar generator sets. A 500-hp electric over hydraulic remote controlled power unit supplies power for all the fishing gear and deck machinery.

The catch is hauled aboard the upper fishing deck by 50-ton winches, then transferred to the lower processing deck through hydraulically-operated flush hatches and transferred by conveyor to the two holding tanks. The fish is kept fresh by recirculating sea water, chilled to 34 degrees Fahrenheit in the two insulated tanks until it is pumped aboard a factory processing ship. Navigation and communication systems consist of radars, SSB, GPS, VHF, satellite navigation and communication terminal and the latest technology in fish finding and depth sounding equipment. An auto-trawl and monitoring system was installed to obtain maximum performance of the net at all times and monitor the catch by measuring the tension on the trawl cables giving the captain an alarm when the net is full. The vessel has a 600-gallon per day water maker and a carbon dioxide fire extinguishing system.

For more information on the services of Homeport Marine,

Circle 82 on Reader Service Card

MarAd Approves Requests To Purchase Vessels

The Maritime Administration (MarAd) has approved the requests of Malbrook Navigation Ltd. and Norwood Shipping Corp. for permission to purchase and transfer to Greek or Bahamian registry the 117,285-dwt tankers Ocean Challenger and Ocean Wizard.

Malbrook and Norwood were the high bidders at a court-ordered auction. The vessels were formerly owned by Belmont VLCC II, Inc.

Built in Sparrows Point, Md., in 1976, the vessels will be used in the international bulk trades.

MarAd's permission is required by section nine of the Shipping Act of 1916, as amended.

ACL Appoints Fuller Vice President, Technology

American Commercial Lines, Inc. (ACL) has announced the appointment of **Geoffrey L. Fuller** as vice president of technology.

Mr. Fuller is former general manager of administration and information systems at Total Distribution Services Inc. (TDSI), a subsidiary of CSXT, Baltimore, Md. During his 26-year career Mr. Fuller has worked in several capacities including systems analyst and designer, director of systems and advanced planning, and director of system integration.

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- SHAPES AND SIZES: flush round 8, 14, 18, 22, 24, 26, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150, 156, 162, 168, 174, 180, 186, 192, 198, 204, 210, 216, 222, 228, 234, 240, 246, 252, 258, 264, 270, 276, 282, 288, 294, 300, 306, 312, 318, 324, 330, 336, 342, 348, 354, 360, 366, 372, 378, 384, 390, 396, 402, 408, 414, 420, 426, 432, 438, 444, 450, 456, 462, 468, 474, 480, 486, 492, 498, 504, 510, 516, 522, 528, 534, 540, 546, 552, 558, 564, 570, 576, 582, 588, 594, 600, 606, 612, 618, 624, 630, 636, 642, 648, 654, 660, 666, 672, 678, 684, 690, 696, 702, 708, 714, 720, 726, 732, 738, 744, 750, 756, 762, 768, 774, 780, 786, 792, 798, 804, 810, 816, 822, 828, 834, 840, 846, 852, 858, 864, 870, 876, 882, 888, 894, 900, 906, 912, 918, 924, 930, 936, 942, 948, 954, 960, 966, 972, 978, 984, 990, 996, 1002, 1008, 1014, 1020, 1026, 1032, 1038, 1044, 1050, 1056, 1062, 1068, 1074, 1080, 1086, 1092, 1098, 1104, 1110, 1116, 1122, 1128, 1134, 1140, 1146, 1152, 1158, 1164, 1170, 1176, 1182, 1188, 1194, 1200, 1206, 1212, 1218, 1224, 1230, 1236, 1242, 1248, 1254, 1260, 1266, 1272, 1278, 1284, 1290, 1296, 1302, 1308, 1314, 1320, 1326, 1332, 1338, 1344, 1350, 1356, 1362, 1368, 1374, 1380, 1386, 1392, 1398, 1404, 1410, 1416, 1422, 1428, 1434, 1440, 1446, 1452, 1458, 1464, 1470, 1476, 1482, 1488, 1494, 1500, 1506, 1512, 1518, 1524, 1530, 1536, 1542, 1548, 1554, 1560, 1566, 1572, 1578, 1584, 1590, 1596, 1602, 1608, 1614, 1620, 1626, 1632, 1638, 1644, 1650, 1656, 1662, 1668, 1674, 1680, 1686, 1692, 1698, 1704, 1710, 1716, 1722, 1728, 1734, 1740, 1746, 1752, 1758, 1764, 1770, 1776, 1782, 1788, 1794, 1800, 1806, 1812, 1818, 1824, 1830, 1836, 1842, 1848, 1854, 1860, 1866, 1872, 1878, 1884, 1890, 1896, 1902, 1908, 1914, 1920, 1926, 1932, 1938, 1944, 1950, 1956, 1962, 1968, 1974, 1980, 1986, 1992, 1998, 2004, 2010, 2016, 2022, 2028, 2034, 2040, 2046, 2052, 2058, 2064, 2070, 2076, 2082, 2088, 2094, 2100, 2106, 2112, 2118, 2124, 2130, 2136, 2142, 2148, 2154, 2160, 2166, 2172, 2178, 2184, 2190, 2196, 2202, 2208, 2214, 2220, 2226, 2232, 2238, 2244, 2250, 2256, 2262, 2268, 2274, 2280, 2286, 2292, 2298, 2304, 2310, 2316, 2322, 2328, 2334, 2340, 2346, 2352, 2358, 2364, 2370, 2376, 2382, 2388, 2394, 2400, 2406, 2412, 2418, 2424, 2430, 2436, 2442, 2448, 2454, 2460, 2466, 2472, 2478, 2484, 2490, 2496, 2502, 2508, 2514, 2520, 2526, 2532, 2538, 2544, 2550, 2556, 2562, 2568, 2574, 2580, 2586, 2592, 2598, 2604, 2610, 2616, 2622, 2628, 2634, 2640, 2646, 2652, 2658, 2664, 2670, 2676, 2682, 2688, 2694, 2700, 2706, 2712, 2718, 2724, 2730, 2736, 2742, 2748, 2754, 2760, 2766, 2772, 2778, 2784, 2790, 2796, 2802, 2808, 2814, 2820, 2826, 2832, 2838, 2844, 2850, 2856, 2862, 2868, 2874, 2880, 2886, 2892, 2898, 2904, 2910, 2916, 2922, 2928, 2934, 2940, 2946, 2952, 2958, 2964, 2970, 2976, 2982, 2988, 2994, 3000, 3006, 3012, 3018, 3024, 3030, 3036, 3042, 3048, 3054, 3060, 3066, 3072, 3078, 3084, 3090, 3096, 3102, 3108, 3114, 3120, 3126, 3132, 3138, 3144, 3150, 3156, 3162, 3168, 3174, 3180, 3186, 3192, 3198, 3204, 3210, 3216, 3222, 3228, 3234, 3240, 3246, 3252, 3258, 3264, 3270, 3276, 3282, 3288, 3294, 3300, 3306, 3312, 3318, 3324, 3330, 3336, 3342, 3348, 3354, 3360, 3366, 3372, 3378, 3384, 3390, 3396, 3402, 3408, 3414, 3420, 3426, 3432, 3438, 3444, 3450, 3456, 3462, 3468, 3474, 3480, 3486, 3492, 3498, 3504, 3510, 3516, 3522, 3528, 3534, 3540, 3546, 3552, 3558, 3564, 3570, 3576, 3582, 3588, 3594, 3600, 3606, 3612, 3618, 3624, 3630, 3636, 3642, 3648, 3654, 3660, 3666, 3672, 3678, 3684, 3690, 3696, 3702, 3708, 3714, 3720, 3726, 3732, 3738, 3744, 3750, 3756, 3762, 3768, 3774, 3780, 3786, 3792, 3798, 3804, 3810, 3816, 3822, 3828, 3834, 3840, 3846, 3852, 3858, 3864, 3870, 3876, 3882, 3888, 3894, 3900, 3906, 3912, 3918, 3924, 3930, 3936, 3942, 3948, 3954, 3960, 3966, 3972, 3978, 3984, 3990, 3996, 4002, 4008, 4014, 4020, 4026, 4032, 4038, 4044, 4050, 4056, 4062, 4068, 4074, 4080, 4086, 4092, 4098, 4104, 4110, 4116, 4122, 4128, 4134, 4140, 4146, 4152, 4158, 4164, 4170, 4176, 4182, 4188, 4194, 4200, 4206, 4212, 4218, 4224, 4230, 4236, 4242, 4248, 4254, 4260, 4266, 4272, 4278, 4284, 4290, 4296, 4302, 4308, 4314, 4320, 4326, 4332, 4338, 4344, 4350, 4356, 4362, 4368, 4374, 4380, 4386, 4392, 4398, 4404, 4410, 4416, 4422, 4428, 4434, 4440, 4446, 4452, 4458, 4464, 4470, 4476, 4482, 4488, 4494, 4500, 4506, 4512, 4518, 4524, 4530, 4536, 4542, 4548, 4554, 4560, 4566, 4572, 4578, 4584, 4590, 4596, 4602, 4608, 4614, 4620, 4626, 4632, 4638, 4644, 4650, 4656, 4662, 4668, 4674, 4680, 4686, 4692, 4698, 4704, 4710, 4716, 4722, 4728, 4734, 4740, 4746, 4752, 4758, 4764, 4770, 4776, 4782, 4788, 4794, 4800, 4806, 4812, 4818, 4824, 4830, 4836, 4842, 4848, 4854, 4860, 4866, 4872, 4878, 4884, 4890, 4896, 4902, 4908, 4914, 4920, 4926, 4932, 4938, 4944, 4950, 4956, 4962, 4968, 4974, 4980, 4986, 4992, 4998, 5004, 5010, 5016, 5022, 5028, 5034, 5040, 5046, 5052, 5058, 5064, 5070, 5076, 5082, 5088, 5094, 5100, 5106, 5112, 5118, 5124, 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Bisso Marine Completes Five Barges

Bisso Marine Co., Inc. of New Orleans, La., using its 700-ton derrick barge Cappy Bisso and 600-ton derrick barge Lili Bisso has completed the loadout of five 195 x 35 x 12 foot barges for Del Bene S.A.C.I.F. through its agent KRS Corporation, Jackson, Miss. The four hopper barges and one tank barge each weigh 300 tons. The barges were fitted for lifting with padeyes installed by Zito Marine Repair, Jefferson, La. The barges were loaded onto tank barges that had been strapped together to provide the transport platform.

The final destination of the barges is Buenos Aires, Argentina.

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For a copy of the 4-color, 6-page brochure and detailed specifications on the Marine Travelift 200 BFM and 300 BFM Mobile Boat Hoists,

Circle 22 on Reader Service Card

Ramsden E&P Services Appointed Marketing And Sales Agent

Ramsden E&P Services, Inc. of Longbeach, Calif. has been appointed marketing and sales agent by German & Milne, Inc. of Hous-

ton, Texas for their CARMA and Saysar products.

Ramsden E&P Services, Inc. was founded in 1985 by Harold Ramsden to provide engineering consulting services to the marine industry.

CARMA, Computer Assisted Reciprocating Machinery Analyzer, provides real time diesel diagnosis on an operating engine. Saysar is a diesel engine maintenance program that can work with CARMA.

Ramsden E&P Services will provide CARMA and Saysar products and services for Alaska, California, Hawaii, Oregon and Washington.

New Cummins Marine Service Locations Directory Now Available

Cummins Marine of Charleston, S.C. has prepared a new directory of its worldwide service locations. The new directory, bulletin 3381700, is available at no charge to owners and operators of all Cummins powered vessels.

Organized alphabetically by country and city, the directory is a fast, easy reference for finding the nearest location for marine ports and service. Most locations can provide service right at dockside.

The directory is available through Cummins distributors, Tel: 1-800-DIESELS. Or write to Cummins Marine, Suite 301, 4500 Leeds Ave., Charleston, SC 29405.

Kuwait Agrees To Use U.S.-Flag Ships In Rebuilding

The Government of Kuwait will allow U.S.-flag vessels to carry up to 50 percent of material and cargo to their country during rebuilding efforts. Until recently, Kuwait refused to honor an agreement to use American ships.

Merchant Marine Committee members threatened to turn the matter over to the Federal Maritime Commission for possible Section 19 action if Kuwait continued to dishonor the agreement to use American ships.

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Circle 192 on Reader Service Card

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Wartsila Vasa 20 Engines Chosen For German Container Ships

Daewoo Shipbuilding & Heavy Machinery Ltd. of South Korea has ordered six Wartsila Vasa 20 auxiliary engines for two container ships to be built for Norddeutsche Vermogen (NVA) Hamburg. Each ship will include three Vasa 6R20's

driving alternators of 860 kW/900 rpm.

The auxiliary engines are specified to operate, from start to stop, on heavy fuel oil up to 600 cSt, which is the same fuel as that for the main engines.

The engines will be supplied by the Wartsila Diesel factory in Vaasa, Finland, in June 1993 to meet the delivery time of the ships in January and early February 1994.

The choice of the Vasa 6R20 was reportedly based on the shipowner's

long satisfactory experience with Wartsila Vasa auxiliary engines operated on heavy fuel oil onboard a large number of ships.

The Wartsila Vasa 20 engine represents the latest medium speed engine technology and includes several new innovations to secure long service life time, low fuel oil consumption and easy maintenance.

Competitiveness for the Wartsila Vasa 20 engine is assured by using the latest production technology at the Wartsila Diesel factory in Vaasa.

For more information on Wartsila Diesel,

Circle 53 on Reader Service Card

Maritime Subsidy Board Approves Transfer Of Obligations To OMI Corp.

The Maritime Subsidy Board has given approval to transfer all applicable Title V obligations to OMI Corp., relating to the vessel Spirit of Texas, built with the aid of construction subsidy.

OMI has agreed to pay MarAd \$5.5 million and to accept delivery of the vessel on an "as is, where is" basis.

The Board found pursuant to section 501(a), 502, and 504 of the Act, that OMI possesses the ability, experience, financial resources and other qualifications necessary for the operation and maintenance of the vessel.

MSI Publication Describes New Concepts In Marine Simulator Training

Technology update, training incentives and proficiency certification are among the innovative concepts described in a new publication issued by MarineSafety International (MSI). The new six-page document outlines the objectives and coverage of over two dozen simulator-based courses which have been developed for deck officers and pilots, ship's engineers and Vessel Traffic Service (VTS) personnel.

The training is available at MSI's simulation centers at Kings Point, N.Y., Newport, R.I., and, in September, in Rotterdam, The Netherlands. The new approaches described are based on lessons learned from MSI's parent corporation, FlightSafety International, a leader in aircraft pilot training.

MSI will award a proficiency card to officers who have demonstrated their ability to control a large ship in a crowded harbor or waterway. The award will be based on a carefully structured course sponsored by the officer's company. Dr. Eugene Guest, MSI's director said, "The ultimate purpose of this program is to provide a set of standards through which an individual pilot or ship's officer or employer can determine and document professional proficiency." MSI is backing up their ProCard™ with a free simulator analysis of any shiphandling incident in which the holder is involved and a fifteen percent discount on refresher training.

Other features described in the MSI publication are technology updates which are provided with each course and optional proficiency check points for self-evaluation. Many of MSI's courses have been approved by the U.S. Coast Guard for seetime equivalency.

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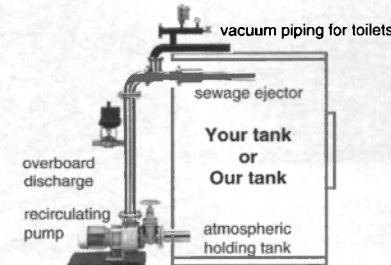
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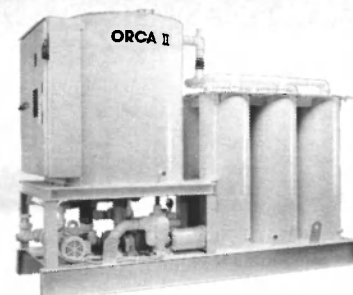
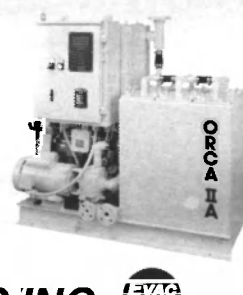
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Circle 199 on Reader Service Card

Canadian Shipbuilding

Canadian Yards Remain Active Despite Limited Funds

J. Y. Clarke, president
Canadian Maritime Industries Association

According to 1992 Canadian statistics, last year saw an average of 10,283 shipyard employees compared to 11,333 a year earlier, for a reduction of 1,050 workers, or 9.3 percent of the shipyard workforce.

Canada's two largest shipyards, MIL Davie at Lauzon, Quebec and Saint John Shipbuilding at Saint John, New Brunswick, remain engaged on naval contracts to date. At the MIL Davie yard, all three patrol frigates are in the water being out-fitted, and all will have been delivered to the Navy by the end of 1994. The last two Tribal Class guided missile destroyers will also have completed their major modernizations by that time and, at present, there is no sign of new major contracts to come next year. Thus the present outlook is understandably gloomy.

At Saint John Shipyard, work is progressing well on the remaining ships of the second batch of six patrol frigates, the last of which is scheduled for delivery in 1996. By then, Saint John Shipbuilding will also have been faced with major layoffs of top-notch engineers, technicians and skilled workers, unless

further contracts for sophisticated ships are forthcoming.

In other East Coast yards, periodic refitting and docking of ferries and fishing vessels, construction of a passenger ferry for the Northumberland Straits, and fabrication of structures for the Hibernia project are currently in progress.

With respect to an outlook for the future, the National Defense order for 12 Maritime Coastal Defense Vessels will result in a start-up of activity in a major shipyard this Fall.

Further fabrication work for Hibernia and continuing refits and dockings of East Coast ferries, as well as commercial vessels, are all that can be predicted at present. However, considerable work for maritime industries will undoubtedly evolve from the "Fixed Link to PEI" Project, if and when it gets underway.

In the Great Lakes, sequential refit of two Navy destroyer-escorts, together with routine maintenance of lakers and other commercial vessels, will keep the major shipyard in the area, as well as a few smaller

yards, viable. On the West Coast, the second of two large "super-ferries," which are Ro/Ro car-passenger vessels, is progressing well with completion scheduled for this Fall. The first is already completed, as are two smaller ferries, all for the BC Ferry Corporation. The super-ferries are built in three separate shipyards, with major segments floated or barged to the large graving dock at Esquimalt for assembly. Other activity in West Coast shipyards is restricted to construction of fishing vessels and pleasure crafts, and refits of HMCS Protecteur as well as several tugs, barges and fish boats.

Beyond the immediate future, a need for replacement programs for aging Canadian commercial fleets, both domestic and international, grows more urgent with each passing year. In addition, the requirement to replace old tankers with modern double-hull versions is also becoming urgent at a time when cash-flows and capital reserves are very low.

Concerning allied maritime industries, i.e., ship designers, ma-

rine equipment manufacturers and distributors, as well as marine engineering consultant services, the story is not as grim. A number of our allied industry members are increasing their sales due to exports to the U.S. and abroad. Reasons for this growth are the forming of partnerships within Canada or of joint ventures with foreign companies. An example of this is the recent formation of the Western Canada Marine Group, formed by a core of six private companies supported by governments, which functions as a single entity to offer design, project management, financial services and a total equipment and service package to support offshore or domestic shipbuilding activities.

Activities such as these, together with the aggressive marketing of major Canadian shipyards to prospective foreign markets, are deemed to be the optimum "way ahead" for our maritime industrial sector, in the sense that a strong commercial component to complement future government requirements could well re-instate a marine industrial base in Canada.



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Adm. Kime Editorial

(Continued from page 137)

expand their coverage potential. We are expanding our liaison with the National Marine Fisheries Service and the Department of State to ensure coordinated efforts. In 1992, more than 20 percent of our ship resource hours were committed to this vital program.

Because of the growing national and international concern for the environment, we recently published a Coast Guard Environmental Policy Statement, "A Commitment to Environmental Excellence." The Coast Guard's leadership in environmental protection is key to supporting the U.S. economic interest in a safe, global marine transportation system. In a typical day over the last year, our people responded to 23 oil or hazardous chemical spills and investigated 17 marine accidents.

Through our ongoing involvement in the International Maritime Organization, we were instrumental in getting the maritime nations of the world to adopt new standards for passenger ship safety and oil tanker construction and operations. Domestically, we have begun issuing and enforcing over 30 new regulations mandated by the Oil Pollution Act of 1990 (OPA 90) to prevent spills, mitigate environmental damage and ensure appropriate cleanup response to oil spills in U.S. waters.

In response to provisions of OPA 90, the National Strike Force Coordination Center (NSFCC) has been created. They coordinate the activities of three separate Strike Team commands while supplementing those staffs with a dedicated pollution response exercise staff. NSFCC also maintains what will eventually become an international database of spill response resources known as the Spill Response Resource Inventory. In addition, the first two of an eventual 19 sites have received prepositioned oil spill response equipment as also required under OPA 90. The addition of these resources will allow us to more rapidly respond to oil and hazardous material spills.

I see environmentally sensitive activities such as ocean dumping, hazardous waste disposal, and transportation of chemicals and fossil fuels generating increased requirements for international oversight and U.S. leadership in the further development of the Convention at the International Maritime Organization.

Finally, the U.S. Coast Guard continues to enjoy a unique relationship with the U.S. Navy. Although there are many similarities between us in terms of equipment, training and doctrine, the differences emerge when taking into account the ability of the Coast Guard's three maritime roles as discussed earlier to support national defense. We have the ability as shown during Desert Shield/Storm, and in other ongoing operations, to provide singular, non-re-

dundant and yet complementary naval resources. As an update on some of that equipment, the Fleet Renovation and Modernization (FRAM) program for our 378-foot high endurance cutters has been completed. In addition, the overhauls being done on our 210-foot medium endurance cutters is ongoing and on-track. Progress continues in the effort to build a third polar icebreaker. We expect to be able to let the contract for the Cutter HEALY in the fourth quarter of FY 93. We continue our acquisition of a fleet of 47 HH-60 Jayhawk helicopters as replacements for our venerable HH-3 Pelicans. These types of assets, along with a superbly trained corps of people, will continue to provide expertise in warfare support operations such as port security, port safety, harbor defense and coastal sea control. Coast Guard law enforcement detachments continue to provide assistance to naval commanders in both operational and training roles for ongoing UN-backed international efforts off the coast of Iraq and Yugoslavia. Off Iraq, for example, law enforcement detachments deploy aboard Navy

frigates and inspect cargo vessels in the Red Sea bound for the port of Aqaba, Jordan. Last year Coast Guard law enforcement detachments and multinational force teams boarded and verified the cargo of more than 1,600 merchant ships; these operations are likely to continue as the UN imposes sanctions against Iraq.

In 1993, I am certain that the Coast Guard's focus will change in response to new crises and disasters as well as to shifting public priorities and interests. It is just this type of free form response capability coupled with the versatility and diversity of our multi-mission character - as truly reflected in both our people and equipment - that allow the Coast Guard to serve the nation so well. In this era of profound change, both nationally and globally, the Coast Guard is well poised to respond to all of America's future maritime interests. Our ability to provide both unique and distinct services will allow us to meet the nation's future broad termed security challenges, while maintaining our status as America's primary ocean-policy and maritime agency.

U.S. Yard Survey (Continued from page 45)

Shipyard		Dimensions (in feet)		Main Engines	Owner Operator	Delivery Date
Vessel	Type	L	W x D			

Foss Shipyard, 660 W. Ewing St., Seattle, Wa. 98119

Sea Prince	Ocean Tug	126 x 34 x 16	Alco	Crowley Maritime	3/93
Mogul	Ocean Tug	120 x 32 x 15	Caterpillar	Mogul Ocean Tow	4/93
H.O. Campbell	Coastal Tug	85 x 27 x 12	Caterpillar	Campbell Towing	1/93
Sioux	Coastal Tug	110 x 34 x 11	EMD	Crowley Maritime	4/93
Sea Trader	Ocean Tug	220 x 45 x 14	Alco	Northland Services	12/92
Wedell Foss	Voith-Schneider Tug	100 x 40 x 16	EMD	Foss Maritime	8/93

General Dynamics, Electric Boat Div., 75 Eastern Pt. Road, Groton, Conn. 06340

Springfield	Los Angeles Submarine	n/a	n/a	U.S. Navy	12/92
Nebraska	Trident Submarine	n/a	n/a	U.S. Navy	Summer 1993
Columbus	Los Angeles Submarine	n/a	n/a	U.S. Navy	Summer 1993

Ingalls Shipbuilding Inc., P.O. Box 149, Pascagoula, Miss. 39568

LHD 2	844 x 106	n/a	U.S. Navy	7/92
CG 69	567 x 55	GE	U.S. Navy	9/92
DDG 52	504 x 59	GE	U.S. Navy	10/92
CG 71	567 x 55	GE	U.S. Navy	2/93

Newport News Shipbuilding, 4101 Washington Ave., Newport News, Va. 23807

George Washington	Aircraft Carrier	1,092 x 134 x 100	nuclear	U.S. Navy	6/92
USS Boise	Submarine	362 x 33	nuclear	U.S. Navy	9/92
USS Montpelier	Submarine	362 x 33	nuclear	U.S. Navy	1/93

Tampa Shipyards, Inc. 1130 McCloskey Blvd., Tampa, Fla. 33605

T-AO 191	677 x 98 x 52	n/a	U.S. Navy	2/94
T-AO 192	677 x 98 x 52	n/a	U.S. Navy	10/94
T-AGOS 23	279 x 84 x 52	n/a	U.S. Navy	5/94

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Erwin Industries, Inc., 3893 Research Park Drive, P.O. Box 1168, Ann Arbor, MI 48106-1688
Stan-Blast Abrasives, 3300 River Rd., P.O. Box 968, Harvey, LA 70059

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Carrier Transcold, P.O. Box 4805, Syracuse, NY 13211
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Stat Refrigeration AB, Butangsgatan 16, S-601 87 Norrköping, SWEDEN

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Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., P.O. Box 986, Sonoma, AZ 85637

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Caruthersville Shipyard, Inc., DBA/St. Louis Ship, P.O. Box 1134, Caruthersville, MO 63830
Zidell Marine Corp., 3121 S.W. Moody Ave., Portland, OR 97201

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McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell Marine Corp., 3121 SW Moody Ave., Portland OR 97201

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In-Place Macining, 1929 N. Buffum St., Milwaukee, WI 53212
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orkel Engineering, 2335 Prairie Road-Unit D, Eugene, OR 97402
Tenmat Inc., 511 Interchange Blvd, Newark, DE 19711

Thornton Bearings Inc., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

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Miracle Steel, Waterford Tower, Ste. 500, 503 N. Hwy 169, Minneapolis, MN 55441

BOILER—Manufacturers

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151 Maritime Services, 34062 El Encanto B, Dana Pt. CA 92629
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Montray's Tug & Barge Sales Corp., 35 De Hart St., Monmouth NJ 07960

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Leibher-Werk Nenzeng GES.mbh, P.O. Box 10, A-6710 Nenzeng, AUSTRIA
Marine Travelift, Inc., 49 E. View St., Sargson Bay, WI 54225
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
Petibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883
Smatoz Industries, P.O. Box 4036, Houma, LA 70361
Westmont Inds, 10805 Painter Ave, Santa Fe Springs, CA 90670
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FANS—VENTILATORS—BLOWERS

Caring Turbo-Blower Co., 8 Wieraska St., P.O. Box 15048, Worcester, MA 01615
Jon M. Les Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS

Jameslow Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Revar Fasteners, P.O. Box 345, Roanoke, VA 24003
Robins 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

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

FIBER OPTIC SYSTEMS

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

FIN STABILIZERS

Bohm & Voss AG, P.O. Box 10 0720, D-2000 Hamburg 1, GERMANY;
U.S.A. Reps. Simplex-Turnar Inc., P.O. Box 168, Little Neck, NY 11363-0168

FIRE DETECTION SYSTEMS

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
Unitor Ship Service, Inc., 2375 W. Esther St., Long Beach, CA 90813

FIRE STOP PRODUCTS

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

FRICTION COMPONENTS/PARTS

Champion Friction Co., 845 McKinley St., Eugene, OR 97440
Woolster Products Inc., 1000 Spruce St., P.O. Box 686, Wooster, OH 44691

FUEL ADDITIVES, CONDITIONING

Hammonds Fuel Additives, PO Box 38114 407, Houston, TX 77238-8114

GALLEY EQUIPMENT

Alta Marine Services, 6960 NW 46th St., Miami, FL 33166
Cosopolite Refrigerator Co., 949 Industry Rd., Kenner LA 70062
Gayford Industries, 10900 S.W. Avery St., P.O. Box 1149, Tualatin, OR 97062
Lang Manufacturing, P.O. Box 905, Redmond, WA 98073
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031
Toastmaster, 1400 Toastmaster Dr., Egin, IL 60120-9272

GANGWAYS/LADDERS

Sea Systems Inc., 65 Avco Road, Ward Hill, MA 01835
Woolster Products Inc., 1000 Spruce St., P.O. Box 686, Wooster, OH 44691

GENERATORS

Mercantile Manufacturing, P.O. Box 855, Minden, LA 71058

GROUND FAULT PROTECTION & LOCATION EQUIPMENT

Bender, Inc., 400 Gordon Drive, Bldg. 501, Exton PA 19341

HATCHES

L.S. Bauer, 7527 NE 33rd Dr., Portland, OR 97211

HEAT EXCHANGERS

Alfa-Laval Separation Inc., 955 Meams Rd., Warminster, PA 18974
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
AIS Vestia, P.O. Box 548, DK-9100 Aalborg, DENMARK U.S. Agent: Aalborg Ciseriv Houston, Inc., P.O. Box 908, Angleton, TX 77515

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

Transfer Inc, Old Burk Road, Wichita Falls, TX 76707

HORN/WHISTLES

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

HYDRAULICS

American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavo Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Hagglunds Denison, 14249 Industrial Parkway, Marysville, OH 43040

HYDRO JETTING PUMP/UNIT

Harbin Inc., PO Box 2250, Cumming, GA 30130

INCINERATORS

American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
AIS Vestia, P.O. Box 548, DK-9100 Aalborg, DENMARK U.S. Agent: Aalborg Ciseriv Houston, Inc., P.O. Box 908, Angleton TX 77515

INSULATION

Branton Industries, Inc., 1101 Edwards Ave., Hanahan, LA 70123
Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

INTERIOR DESIGN

Directions in Design, 633 Emerson Suite 100, St. Louis, MO 63141

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—Waterproofing—Panning—Coating Systems—Decking

Branton Industries, Inc., 1101 Edwards Ave., Hanahan, LA 70123
GEC-Maroni Electronic Systems Corp., 550 S. Fulton Ave., Mt. Vernon, NJ 10550
IMAC AB, Berge Alle 1, S-252 55 Helsingborg, SWEDEN
U.S. Rep: Hopeman Brothers, Inc., P.O. Box 620, Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc., 1250 NW Second Ave., Boca Raton, FL 33431
Marine Accommodations Inc., 8335-3 Baymeadows Rd., Se 140, Jacksonville, FL 32256
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Walz & Krenzer, Inc., 90 Forest Ave. Locust Valley N.Y. 11590

KEEL COOLERS

R.W. Fernstrom & Co., 1716 Eleventh Ave., Menominee, MI 49858
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Waller Machine Co., Inc., 84-86 Cambridge Avenue, Jersey City, NJ 07307

LEAK DETECTION

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

LIFEBOATS/RAFTS

American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Boston Whaler, Inc. Commercial Products Div., 1149 Hingham St., Rockland, MA 02370
F.T. Fissermer GmbH & Co., D-2678 Berne 2, Wesse, GERMANY
Norsafe AS, P.O. Box 115, N-4818 Faenvik, Norway
Wlard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America, P.O. Box 400, Stevensville, MD 21166

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

LIQUID CARGO HEATERS
First Thermal Systems, Inc., P.O. Box 4756, Chattanooga, TN 37405

LIQUID LEVEL INDICATORS
Sector, 2 Dean St., Tenafly, NJ 07670

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

Sector, 2 Dean St., Tenafly, NJ 07670

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

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

LUBRICANTS
Pte-Lube, 3730 NW 4th St., Ste. 111, Ft. Lauderdale FL 33325

MACHINERY MAINTENANCE, REPAIR, OVERHAUL AND TESTING
Del Gaudio, 619 Industrial Rd., Carlstadt, NJ 07072

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

Golden Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231

New England Trawler Equipment Co., 281 Eastern Avenue, Chelsea, MA 02150

MACHINERY MONITOR AND CONTROL SYSTEMS
Electronic Marine Systems, 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

Hoyeman Brothers, P.O. Box 800, 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

Marine Services Corp., 3457 Guilford Dr., Hood River, OR 97031

MARINE COATINGS
Royal Chemical, 2705 Concord Road, Belle Chasse, LA 70037

MARINE FURNITURE
Directions in Design, 633 Emerson, Ste. 100, St. Louis MO 63141

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

Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave., Boca Raton, FL 33431

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

Marine Services Corp., 3457 Guilford Dr., Hood River, OR 97031

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

MARINE RADAR COMPONENTS
EEV, Inc., 4 Westchester Plaza, Elmsford, NY 10523

MARINE SHIP MANAGEMENT
BarbaArkhn, 1810 Chapel Ave. West, Cherry Hill, NJ 08002

MARITIME EDUCATION
Seascope Church Institute, 741 Water St., New York City, NY 10038

METAL PRODUCTS
Engineered Data Products, P.O. Box 565, Woodbury, NY 08906-7565

Jamestown Metal Marine Sales, Inc., 4710 N.W. Second Ave., Boca Raton, FL 33431

MOTORS
MULTI-CABLE PENETRATION DEVICE
NMP, 12437 E. 60th St., Tulsa, OK 74153

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202

CDI Marine Co., 9487 Regency Square Blvd., Ste. 500, Jacksonville, FL 32225

Childs Engineering Corp., Box 333, Medfield, MA 02052

Crandall Dry Dock Eng'rs., Inc., 21 Pottery Ln., Dedham, MA 02026

Crane Consultants, 15301 First Ave S., Seattle WA 98148

C.T. Cushing, 18 Vesey St., New York, NY 10007

Arthur D. Darden, 3200 Ridgeway Dr., Suite 403, Metairie LA 70002

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

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

Enron Mgmt & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706

GHM Inc. (Ind. Measurement Consultants), P.O. Box 1636, Newport News, VA 23601

Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010

The Glisten Assoc., Inc., 600 Mutual Life Bldg., 405 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

J&H 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. Kroger, 1515 NW 7th St., Ste. 124, Miami FL 33125

Rooney E. Lay & Associates, 13811 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 Seaside, Houston, TX 77063

John V. McCollum, Inc., 1189 Long Point Road, MI, 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 Martbury, P.O. Box 2321, Annapolis, MD 21401

Marine Design & Operations, Inc., 226 Chestnut St., Roselle Park, NJ 07204

Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902

Marine Power Associates, 1010 Turquoise St., Ste 217, San Diego, CA 92109

Maritech, Seaciff, Bay Road, Newmarket, NH 03857

Maritime Design, Inc., 3020 Hartley Rd., Jacksonville, FL 32257

R.J. Mellus & 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 Fulton St., Ste. 301, San Francisco, CA 94107

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

Sea School, 10612 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

NAVAL BOATBUILDERS
Atlantic Boat Group, Inc., 1850 Lake Park Dr., Ste. 216 Smyrna, GA 30080

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

Celinet Corp., 400 Main St., Stamford, CT 06901-3004

Comsat Maritime Services, 950 J. Edgarton Plaza SW, Washington DC 20024

C. Plath, 222 Seavem Ave., Annapolis, MD 21403

Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065

Fairride 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

Herschel, Inc., 9 Hoyt Drive, Newburyport MA 01950

IDB Mobile Communications, 18281 Street NW, Suite 860, Washington, D.C. 20036

Kenwood USA Corp., Marine Prod. Div., 2201 E. Dominguez 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

Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY

Novatech, 820 Commodant St., Victoria, BC V8W 1R1, CANADA

Raytheon Marine Co., 46 River Road, Hudson, NJ 08051

Robertson Marine Systems, 3000 Kingman Street, Suite, 207, Metairie, LA 70006

SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116

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

Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036

Sperry Marine Inc., 1070 Semirole Trail, Charlottesville VA 22901

Standard Communications, P.O. Box 32151, Los Angeles, CA 90009

Summer Equipment Ltd., 24 West 4th Ave., Vancouver V5Y 1G3, CANADA

Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086

Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130

World Communications Sys., 11834 Canon Blvd., Newport News, VA 23606

OIL—Additives
Mobil Oil Corporation, 3225 Galloway Road, Fairfax, VA 22037-0001

Shell Oil, P.O. Box 2463, Houston, TX 77252

Tesco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS

ACS Industries, Inc., 14208 Industry Rd., Houston, TX 77053

Alfa-Laval Separation, Inc., 955 Meams Rd., Warrminster, PA 18974-0556

Blom & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY

Blom & Voss-Simplex-Turnar, Inc., PO Box 168, Little Neck, N.Y. 11363

U.S.A. Repe Simplex-Turnar Inc., P.O. Box 168, Little Neck, NY 11363-0168

Carthage, Inc. (Westfalia Separators), 100 Fairway Court, Northvale NJ 07647

Fast Systems, 3240 North Broadway, St. Louis, MO 63147

MMC International, 60 Inp Dr, Inwood NY 11696

National Fluid Separators, 827 Hanley Industrial Ct, St. Louis, MO 63144

Amerson, 201 N. Berry St., Brea, CA 92622

The Ameslax Corp., Corrosion Dynamics Div., 1100 Walnut St., Rosell, NJ 07203

Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502

Jamestown Distrib., 28 Naragansett Ave., P.O. Box 348, Jamestown, RI 02835

Hempel Coatings, Foot of Cune Avenue, Wallington, NJ 07057

Melvin Pierce Marine Coating, Inc., P.O. Box 55, Semmes, AL 36575

Microphor, Inc., Marine Div., 452 E. Hill Rd., P.O. Box 1460, Willis, CA 95490

U.T. Technologies Ltd., Box 31114, Robe St. RPO, Halifax, Nova Scotia, Canada B3K 5T9

Sigma Coatings, 8979 Market St., Houston, TX 77029; 330 River Rd., Harvey, LA 70059; 1100 Adams St., Hoboken, NJ 07030

PAINT REMOVAL
LTC Americas, 101 G. Executive Dr., Sterling, VA 22170

PIPEFITTINGS/CONNECTING SYSTEMS
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248

Lokring, 396 Hatch Drive, Foster City, CA 94404

Shirley G. Flagg Co., 1020 W. High St., Slowe, PA 19464

PORT SERVICES
Port of Portland, 5555 N. Channel Ave., Portland, OR 97217

PROPULSION EQUIPMENT—Boatthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Avondale Industries, Harvey Creek Repair, P.O. Box 116, Harvey, LA 70058

American Air Filter, P.O. Box 35690, Louisville, KY 40432

ABB TURBOCHARGER, INC., 1460 Livingston Avenue, N. Brunswick, NJ 08902

ASEA Brown Boveri (Siemens), P.O. Box 185, 00581 Helsinki, FINLAND

Aquamaster-Raumta 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., Wabole, MA 02081

Burnell A/S, P.O. Box 370, N-401, Molde, Norway

CWF Hamilton & Co., Ltd., P.O. Box 709, Christchurch, NEW ZEALAND

Caterpillar, 1000 Adams Street, Peoria, IL 61629-2320

Cotec 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

Financieri Diesel Engines Div—GMT, Bagnoli della Rosandra 334, Trieste, ITALY

Fundaciones RICE, AV. Republica No. 88, COL. BENITO JUAREZ, Mazatlan, GE NAL & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420

Harbormaster Marine, Inc., 31777 Industrial Road, Livonia, MI 48150

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

Maritimes RICE, AV. Republica No. 88, COL. BENITO JUAREZ, Mazatlan, GE NAL & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420

Lohmann & Stoterloht, P.O. Box 1860, D-5810 Wille, Germany

Mapeco Products Inc., 90 Forest Ave., Locust Valley, N.Y. 11560

Marine Gears, Inc., P.O. Box 889, Greenville MS 38701

Maritimes RICE, AV. Republica No. 88, COL. BENITO JUAREZ, Mazatlan, GE NAL & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420

MAN B&W Diesel, 17 State St., New York, NY 10004

MAN B&W Diesel A/S, Osterv 2, DK-4960 Hovely, DENMARK

MAN B&W Diesel, 17 State St., New York, NY 10004

MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 GERMANY

Mitsubishi Heavy Industries America, Inc., 630 Fifth Ave., Ste. 3450, NY, NY 10011

New Sulzer Diesel Ltd., CH-8401, Winterthur, SWITZERLAND

Omnitruer Inc., 8515 Sorensen Ave., P.O. Box 214, Santa Fe Springs, CA 90670

Rolls SP Propellers SA, Via Silvia 5, P.O. Box 251, 6828 Balerna SWITZERLAND

Rolls SP Propellers USA, 4030 Mustang Road, Melbourne, FL 32934, USA

Karl Seiner 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 30022

Stewart & Stevenson, 1400 Dedrehan, P.O. Box 6, Harvey LA 70059-0008

Thrust Lycoming, 550 Main St., Stratford, CT 06497

Thrustmaster of Texas, 12227-KFM 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

West Tech Gear Corp., 2600 E. Imperial Highway, Lynwood, CA 90252

Westinghouse Marine Div., 401 E Hendy Ave., Sunnyvale, CA 94088

PROTECTIVE WRAPS
FANA (Film Applicators of North America), 1260 E Woodland Ave., Springfield PA 19064

PUMP—Repair—Diesels
Coffin Turbo Pump, Inc., 326 S. Dean Street, Englewood, NJ 07631

Gilkes, Inc., PO Box 628, Seabrook, TX 77586

Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101

Leistriz Corporation, 165 Chestnut Street, Allendale, NJ 07401

Vita Motivator, 99 W Hawthorne Ave., Suite 622, Valley Stream NY 11580

REFRIGERATION/EQUIPMENT SERVICES
Adrick Marine, 1410, Central Ave., Farmingdale, NY 11735

Bailey Refrigeration Co., 2323 Randolph Ave., Avenel, NJ 07001

Unitor Ships Services, Inc., 2375 W. Esther St., Long Beach, CA 90813

REMOTE VALVE OPERATORS
American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906

Teleflex, Inc., 771 First Ave., King of Prussia, PA 19406

ROPE—Marine—Nylon—Hoses—Ropes
Allied Signal Inc., Fibers Division, 141 Broadway, New York, NY 10018

American Manufacturing Co., 200 S. Park Rd, P.O. Box 52125, Lafayette, LA 70505

Dupont, Montgomery 433, 1011 Centre Road, Wilmington, DE 19805

United Ropeworks (USA), Inc., 151 Commerce Dr., Montgomeryville, PA 18936

RUDDER STOCK SEALS
John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

SAFETY LIGHTING
Locite Luminescent Corp., Etna Road, Lebanon, NH 03766

SAFETY TOOLS
NGK Metals Corp., P.O. Box 13367, Reading, PA 19612

SANITATION DEVICE—Pollution Control
Eteson International Corp., 12650 Bournewood Dr., Sugarland TX 77478

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, Willis, CA 95490

SCALE MODELS
Marklect, PO Box 225, Oconomowoc, WI 53066

SHIPBUILDING EQUIPMENT
Surgeon Bay Model Shop, 187 N Ninth Ave., Surgeon Bay WI 54235

SCUTTLES/MANHOLES
L.S. Baier & Assoc., 7527 NE 33rd Dr., Portland OR 97211

SHIPBUILDING EQUIPMENT
NEI Synchronit, Inc., 8970 S W 87th Ct., Miami FL 33176

SHIPBUILDING—Repairs, Maintenance, Drydocking
Asierlos Espanoles S.A., Padilla 17, 28006 Madrid, SPAIN

Atlantic Marine, Inc., P.O. Box 3032, 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 Gorder Drive, Bldg. 501, Eron, PA 15341

BethShip, Sparrows Point Yard, Sparrows Point MD 21219

Bieso Marine Co., P.O. Box 4113, New Orleans, LA 70178

Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374-0250

Boston Whaler, Inc., Commercial Products Div., 1149 Hingham St., Rockland, MA 02070

Bourg Drydock, P.O. Box 1852, Houma, LA 70361

Chris-Marine AB, P.O. Box 9025, S-2000 39, Malmö, SWEDEN

Corrad Industries, 1501 Front Street, P.O. Box 700, Morgan City, LA 70381

Curacao Drydock Inc., P.O. Box 3012, Curacao, Netherlands Antilles

Eastern, 505 North Sam Houston Pkwy. East, Ste. 150A, Houston, TX 77060

European Ship Repair, 120 NE 20th St., Miami, FL 33137

Financieri SpA, Centro Navali Italiani, Via Cipro 11, 18129 Genoa ITALY

G. Marine Diesel, PO Box 050221, Brooklyn, NY 11205

Galveston Shipbuilding, 6800 Port Industrial Blvd, P.O. Box 2660, Galveston, TX 77553

Gulfcraft, Inc., 3904 Highway 182, Patterson, LA 70392

Hall Buck Marine, P.O. Box 35, Baton Rouge, LA 70816

Haller International, 7412 Lakeshore Drive, New Orleans, LA 70124

Hitachi Zosen, Hitachi Shipbuilding & Engineering Co., 1-1-1 Hitatsubashi, Chiyoda-ku, Tokyo 100, JAPAN

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

Institute for International Research, 437 Madison Ave., N.Y., N.Y. 10022

Jacksonville, Shipyards, 750 E. Bay St., Jacksonville, FL 32202

Jellicoff, Inc., P.O. Box 610, Jeffersonville IN 47130

Kivach Marine, 615 N 34th St., Seattle, WA 98103

Leevac Shipyards, P.O. Box 1190, HWY 90 East, Jennings, LA 70546

Lietzke, Apartado 2138, 1103 Lisbon, Codex PORTUGAL

Mil. Davie, Inc., P.O. Box 130, Laval, Quebec, CANADA

Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199

Master Marine, Highway 48 at the Shrimp Basin, Star Rte #3, Brownsville, TX 77520

Marine Manufacturing, 150 Dayton, Washington, 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., Freeport, WA 98249

Norcoral Engineering Co., Inc., P.O. Box 529, 5786 Plantation Rd., Theodore, AL 36582

North Florida Shipyard, Inc., P.O. Box 3255, Jacksonville, FL 32206

Protenco, Ltd., Rua Eugenio Castro, 13A-r/c, 2800 Almada, PORTUGAL, U.S. Rep. Walter Thorsen, Inc., 79 Owens Rd., P.O. Box 755, Marwah, NJ 07430-0755

Thomas Marine, 97 Bradford Street, Patchogue, NY 11772

SeaArk, P.O. Box 210, Monticello AR 71655

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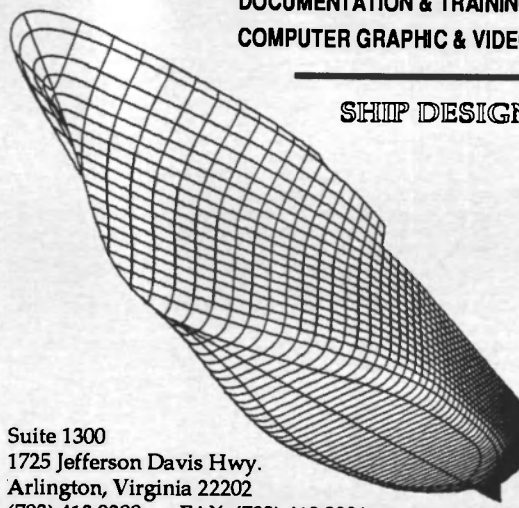
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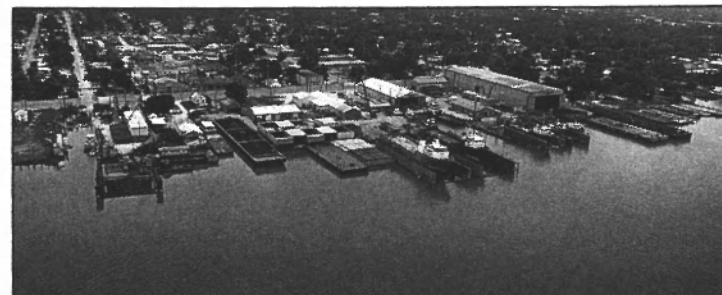
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Sealed proposals addressed to the Executive Director of the Texas Department of Transportation, for the Construction of a New Ferry Vessel, "The Dewitt C. Greer", at the Galveston-Port Boliver Ferry, Galveston County, can be delivered in person (or by a delivery service) to 200 East Riverside Drive, Proposal Room 126, Austin, Texas 78704, or can be mailed to the Executive Director, 125 East 11th Street, Room 12, File D-18B (Bid Proposal), Austin, Texas 78701-2483. Proposals will be received until 2:30 p.m., local time, (C.D.T.) Thursday, JULY 1, 1993, and then publicly opened and read.

Plans and specifications for this project will be furnished without charge to any prime Contractor desiring to submit a bid. No pre-qualification is required. Mailed requests for plans should be addressed to Texas Department of Transportation, Chief Architect, File D-18B, 125 East 11th Street, Austin, Texas 78701. Plans may also be secured locally from Mr. Milton M. Dietert, P.E., District Engineer, Texas Department of Transportation, Attention: Mr. Dennis Mleak, P.E., 7721 Washington Ave., Houston, Texas 77007-1095. Phone (713) 802-5000, or may be picked up in person at the TxDOT Riverside Annex Building, Room 406N, 150 East Riverside Drive, Austin, Texas, Phone (512) 416-3048.

The contract for this work will not be awarded to any contractor or firm which is currently debarred from bidding on Texas Department of Transportation projects. No currently debarred contractors will be permitted to perform subcontract work on this project.

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The estimated over-all construction cost for this proposed contract is \$7,450,000.00.

Only a Cashier's Check or Bank Money Order on a State or National Bank or a Cashier's Check or Money Order on a State or National Savings and Loan Association payable to the order of the Texas Transportation Commission is considered acceptable. This Proposal Guaranty must be payable at or through the institution issuing the instrument or the guaranty instrument must state that the issuing is both the drawer and the drawee of this official obligation to pay the amount stated. A Proposal Guaranty of drawee of One Hundred Thousand Dollars (\$100,000.00) made payable without recourse to the order of the Texas Transportation Commission, must accompany each proposal as a guaranty.

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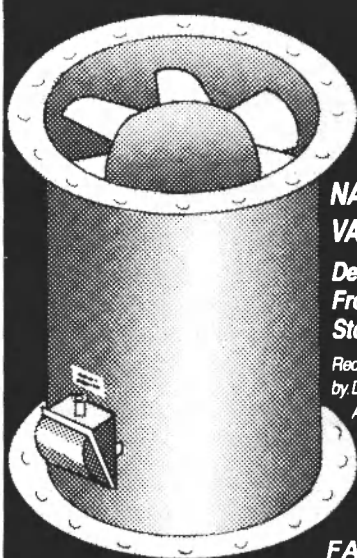
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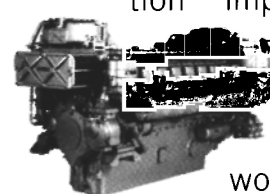
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