

**MARITIME
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AND
ENGINEERING NEWS

APRIL 1991

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***For comparative testing information between Pyplok and MIL-F-1183 and a list showing Pyplok® in-use, contact your local Deutsch office or 1-800-DEUTSCH.**

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ON THE COVER

Offshore rig on location in the Norwegian North Sea. Photo courtesy of Tenneco, Inc.; Inset: USS Hercules (PHM-2), patrol combatant missile ship, built by Boeing Marine. COVER DESIGN: Alex Brown/Artwork Production

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NORSHIPCO Receives \$31.6 Million Contract For Cruiser Overhaul

Norfolk Shipbuilding & Drydock Corporation (NORSHIPCO) of Norfolk, Va., was recently awarded a \$31,602,521 firm-fixed-price-with-performance-fee contract by the Naval Sea Systems Command for the regular overhaul of the cruiser USS Josephus Daniels (CG-27). The work is expected to be completed in June 1992.

Evergreen Signs Lease With Port Of Tacoma

Taiwan's Evergreen Line recently signed a \$1.2 million per year lease with the Port of Tacoma that would move the shipping line's Puget Sound operations from Seattle to Tacoma.

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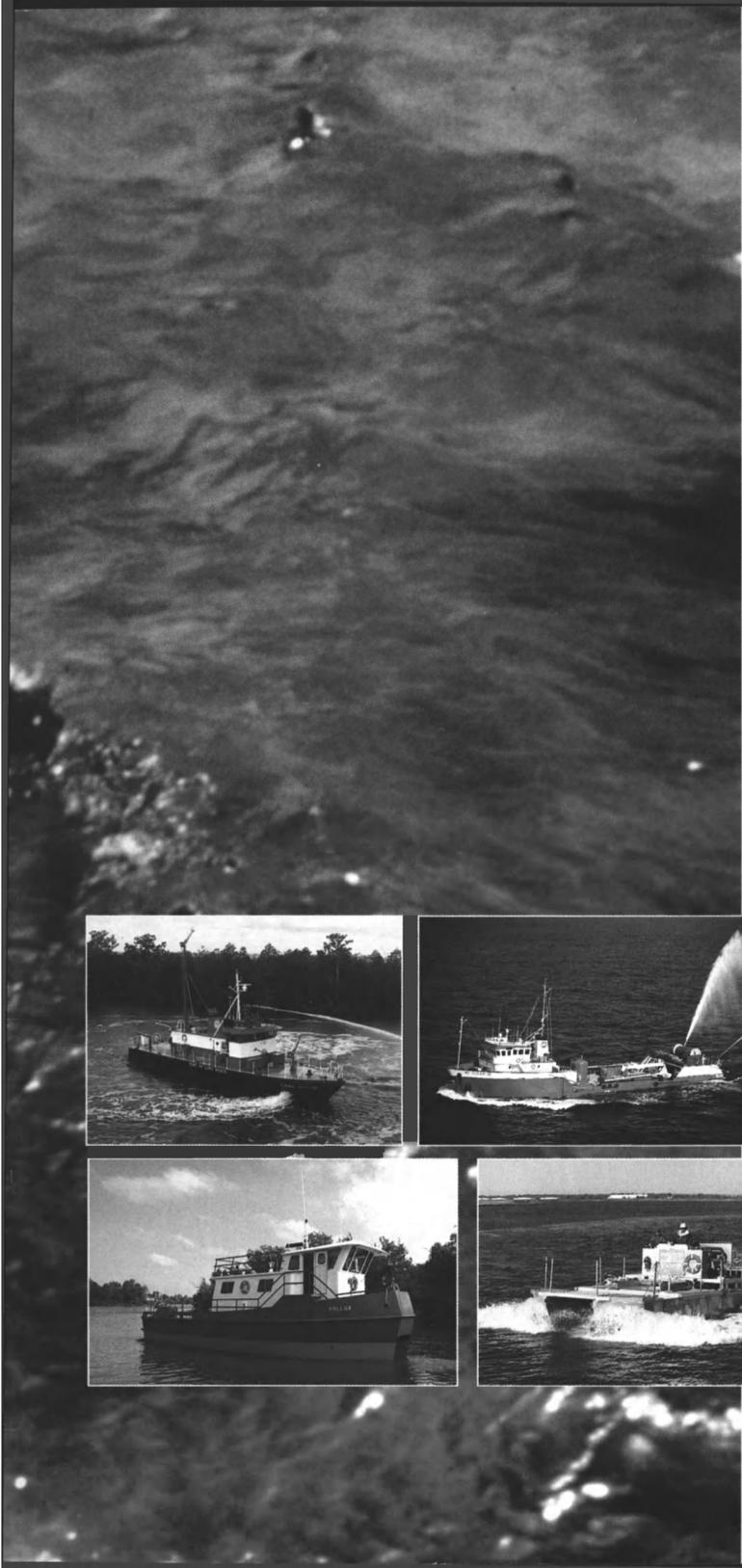
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Halter Marine Christens Second Of Two Navy Survey Ships

Halter Marine, Inc., part of the Trinity Marine Group and a subsidiary of Trinity Industries, Inc., recently christened and launched the USNS Littlehales (T-AGS-52).

The hydrographic survey ship is the second of two sister ships under construction at Halter for the Navy in a \$25 million contract. When completed, both ships will be operated by the Navy's Military Sealift Command for the Naval Oceanography Command whose members conduct the surveys.

The vessel is named in honor of George Washington Littlehales, who was an authority in the fields of magnetics, hydrography, oceanography and cartography, serving in the U.S. Hydrographic Office from 1885 to 1932.

Principal speaker at the ceremony was Rep. Gene Taylor of Mississippi's Fifth Congressional Dis-

trict. The traditional bottle of champagne was broken on the ship's bow by Mrs. Lottchen V. Shivers, granddaughter of Mr. Littlehales. Her daughter, Lottchen G. Shivers, was the maid of honor.

The new ship is 208 feet in length, with a 45-foot beam and 22-1/2-foot depth. When completed, she will carry two 34-foot hydrographic survey launches and will be operated by a crew of 22 MSC personnel. This is in addition to an 11-member scientist/survey party.

Littlehales will collect hydrographic data in water depths from 10 to 4,000 meters using hull mounted and towed sonars.

The Navy has the responsibility to collect all hydrographic data outside the U.S. territorial waters. Data gathered on the survey missions undergoes initial processing at the Naval Oceanographic Office at the



The Littlehales is the second in a series of two T-AGS constructed by Halter Marine under a \$25 million contract.

Stennis Space Center in Mississippi, before being turned over to the Defense Mapping Agency. There the data is used to prepare nautical charts for the armed forces and commercial interests.

For free literature detailing the shipbuilding and repairing capabilities of the Trinity Marine Group,

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Maritime Reporter/Engineering News

**Rauma Constructing
\$125 Million Cruise Ship**

Rauma Yard's Mantyluoto Works in Pori, Finland, recently held a ceremony marking the start of construction of a \$125 million twin-hulled cruise ship, the SSC Radisson Diamond, to be managed and marketed by Radisson Hotel Corp.

The ship's owner, Diamond Cruise Ltd., is owned by Radisson and several Japanese, Finnish and American companies.

The 354-passenger Radisson Diamond is said by its owners to be the world's first cruise ship to have two keels laid. A plate carrying a quarter-carat diamond will be affixed to each keel of the twin-hulled vessel.

For free literature on the facilities and capabilities of Rauma Yards,

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**Literature Available On
COMSAT's SatCom Services**

COMSAT Corporation, Washington, D.C., is offering free literature on its satellite communication services for the offshore drilling platform and maritime industry.

Among the services enumerated by COMSAT in its literature are:

- Smart Card Phone Service—Uses prepaid cards to activate a direct-dial telephone for crew and transit personnel;
- SeaPhone® Service—Relieves vessel management of billing and administrative responsibility by limiting satellite telephone service to collect or credit card calls;
- SeaMail® Service—A satellite-based electronic mail service for mariners. Subscribers can create and edit messages, send telex, Group III facsimile, spreadsheets, computer-generated data files, customized forms and reports on ship operations.

COMSAT Mobile Communication provides maritime, international land mobile and aeronautical satellite communications to customers around the world through its Inmarsat coast earth stations, located in Southbury, Conn., and Santa Paula, Calif.

For free literature detailing COMSAT's satellite communications services for the maritime industry,

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**New IMO Quabbin
Package Improves
Turbine Performance**

Quabbin Division of the Power Components and Services Group of Imo Industries Inc. has announced the introduction of the Quabbin Energy Package. The package, designed with an "Accent on Efficiency" for improved steam turbine performance, reflects the company's comprehensive engineering capabilities to evaluate and restore turbine efficiency without major modifications to components. It includes steam path appraisal, instrumenta-

tion, application of retractable packing, articulated snout rings and particulate seals in conjunction with specific improved repair procedures achieving significant internal gains.

IMO's power components and services aftermarket group is dedicated to serving the owners and operators of turbomachinery and its related equipment. At the forefront of this dedication is an innovative approach to the improvement of

equipment design, manufacturing methods, and repair procedures for rotating machinery.

The Quabbin Division has committed its capabilities in supplying steam turbine parts to a particular focus on innovative solutions designed to improve steam path efficiency. Combined with its conventional product line, Quabbin's accent on efficiency through the "Quabbin Energy Package" has ce-

mented its pledge to product and service excellence.

IMO supplies analytical and optical instruments, electronic and mechanical controls, engineered power products and their support services to industrial and defense customers worldwide.

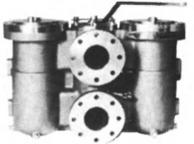
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Two Singapore Yards Report Profit Growth

Singapore's Jurong Shipyard Ltd. and Sembawang Shipyard Ltd. both reported a profit for the year 1990. Sembawang posted a profit after tax and extraordinary of \$30 million, or 28.6 Singapore cents a share in 1990, an eight-year high. This compares with 28 Singapore cents a share in 1989.

A unit of government-controlled Sembawang Holdings Pte. Ltd., the yard said it expects even better performance this year since the cessation of gulf hostilities.

A record profit after tax of \$26.3 million, or 50.4 Singapore cents a share, was posted by Jurong Shipyard in the year through last December 31. That compares with 33.3 Singapore cents a share a year earlier.

Jurong attributed the record earnings to a strategic concentration on ship conversions, tanker repairs

and long-term contracts. Long-term contracts now account for about 30 percent of the shipyard jobs.

Biehl & Company Names Leigh A. Phillips VP

Biehl & Company, Inc., one of the largest steamship agencies on the Gulf of Mexico, has announced the appointment of Leigh A. Phillips to vice president. Mr. Phillips will continue as general manager, East Gulf services, from the agency's New Orleans office.

Mr. Phillips joined Biehl in 1973 in New Orleans, where he was responsible for dealing with Biehl shipping line clients and with government agencies. He was transferred to the agency's Houston headquarters in 1978, where he served in a sales capacity for 12 years.

He returned to New Orleans in 1990 to assume his present position.

BOATS & BARGES



Balehi Marine's GM-powered towboat Choctaw is the second of two identical vessels delivered to Conoco Oil Company.

Balehi Marine Delivers Second Of Two GM-Powered Towboats For Conoco Oil Company

Balehi Marine, Inc. of Lacombe, La., recently delivered the second of two identical 1,800-hp steel-hulled towboats, the M/V Choctaw, to Conoco Oil Company.

The Choctaw, which is based on Balehi Marine's standard 1,800-2,400-hp towboat design, has a length of 81 feet, beam of 28 feet, depth of 11 feet and draft of 7 feet 6 inches. She has a fuel oil capacity of 42,200 gallons, lube oil capacity of 337 gallons, dirty oil capacity of 337 gallons and freshwater capacity of 14,700 gallons. The vessel is powered by twin GM 16V-149 diesel engines driving a pair of four-bladed stainless steel Kahlenberg propellers via Twin Disc MG 540 reduction gears with a reduction ratio of 7:1 with 7-inch-diameter Aquamet shafting. Keel cooling is provided by Fernstrum Grid coolers in recessed pockets.

Electrical power is supplied by two GM-4-71 diesel-driven generator sets rated at 50 kw at 1,200 rpm, 220 V-AC, three-phase, 60 cycle.

The Choctaw, which provides quarters for a crew of six, is fitted with two 40-ton electrohydraulic NABRICO winches. Electronics, searchlights, horns, air compressors, steering, fendering, air conditioning

M/V CHOCTAW	
Equipment List	
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Generator sets	Detroit Diesel
Engine controls	Kobelt
Keel cooling	Fernstrum
Shafting	Aquamet
Propellers	Kahlenberg
Bilge & freshwater pressure pumps	Peabody Barnes
L/O & dirty oil stripping pump	Viking
Air compressors	Quincy
Steering system	Custom Hydraulics
Searchlights	Carlisle & Finch
Compass	Danforth
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and other major equipment were fitted according to the customer's specifications.

For a free eight-page brochure illustrating the standard vessel designs available from Balehi Marine,

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Oceandril Executes Bareboat Charter For Grace Offshore I

Oceandril, Inc., Houston, Texas, recently executed a bareboat charter contract for the Grace Offshore I with Gabring A/S. The Grace Offshore I is a 1979-built Baker Marine BMC-100-IC designed cantilever jackup rig rated from 12 to 115-foot water depths. The rig, which will be

renamed Nueces, is available in state waters offshore Freeport, Texas.

Oceandril provides rig management services to the offshore industry under time charter, bareboat charter and labor contracts.

The company is refurbishing two other jackup rigs—the Ghana National Petroleum Company-owned Production Pioneer and the Norwegian KS company-owned Bigfoot II.

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**Winninghoff Boats Introduces
Versatile Workboat Design—
Literature Available**



The new 7.4 meter Harbor Master can be powered by outboard, inboard/outboard and jet drive propulsion systems.

Winninghoff Boats, Inc., Rowley, Mass., has introduced a 7.4 meter Harbor Master design workboat. Built of all welded aluminum, this 25-foot by 8.5-foot boat joins Winninghoff's existing line of commercial boats which range in size from 18 to 65 feet.

The 7.4 meter Harbor Master is available with outboard, inboard/outboard and jet drive propulsion in both open boat and pilothouse configurations. The hull design is a modified "V" with about 50 degrees of deadrise at the stem and 12 degrees at the transom. Hull draft is 12 inches, and she displaces 4,300 pounds in normal operating conditions.

Winninghoff Boats specializes in the construction of custom boats for specific applications. Winninghoff has capped production at 10 to 15 boats per year in order to afford each individual project the detailed attention it deserves. As a result, the company is able to deliver specifically tailored designs for uncompromised performance in patrol, towing, fire/rescue, oil spill response, research and utility workboat applications.

For details on Winninghoff's new Harbor Master workboat, as well as its other commercial boat designs,

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**Wide Range Of Vessels
Using Hamilton Water Jets
Detailed In Free Literature**

C.W.F. Hamilton & Co. Ltd. of New Zealand is offering free literature on the wide range of craft for which Hamilton water jets were chosen as the preferred propulsion system.

Inboard mounted near the stern, Hamilton water jets draw water through an intake duct and debris screen, fitted flush to the bottom of the hull. A high-performance axial flow impeller pumps high volumes of water, discharging via a nozzle projecting through a sealed transom opening. This results in powerful forward thrust.

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The literature includes photos of the vessels—fire/rescue craft, crewboats, police boats, etc.—for which Hamilton water jet propulsion systems were chosen, brief specifications, and descriptions.

For full information and free copies of the literature on Hamilton water jets,

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April, 1991

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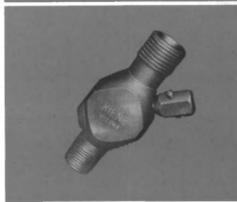
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BOATS & BARGES

Allied Shipbuilders Deliver New Caterpillar-Powered Z-Drive Ship-Assist Tug

Allied Shipbuilders Ltd. of North Vancouver, Canada, recently delivered the 74-foot-long by 28-foot-beam tug Charles H. Cates III (Cates 3) to C.H. Cates & Sons Ltd., also of North Vancouver. The vessel, constructed to the design of Robert Allan Ltd., is the latest in C.H. Cates & Sons' fleet of Z-drive ship-assist tugs for service in the Port of Vancouver.

The Cates 3 is essentially identical to other Z-drive tugs in the Cates

fleet, with twin Z-drives in a "reverse-tractor" configuration. The earlier vessels have proven to be almost ideal for service in the Port of Vancouver.

The tug is configured as a shift boat, with day room facilities only for the crew of two persons.

The wheelhouse is designed for one-man operation and has now been refined through three vessels to the point where every feature is situated optimally for safe and ef-



One of the unique features of the Cates 3 is the line-handling crane on the foredeck. An Atlas extending, knuckle boom crane is used to transfer the tug's nylon/polyester hawser to the deck of an attended ship.

fective control of the tug. Visibility is virtually unimpeded through 360 degrees, with excellent downward and overhead vision all-round.

Main engines on the Cates 3 are a pair of CAT 3512 TA diesels, each rated 1,175 bhp at 1,600 rpm for the ship-berthing service. Each engine

is connected to a Niigata Model ZP-2A 360-degree azimuthing drive through a Niigata Model RGC-130K clutch/reduction gear, and Geislinger torsionally resilient coupling.

(continued)

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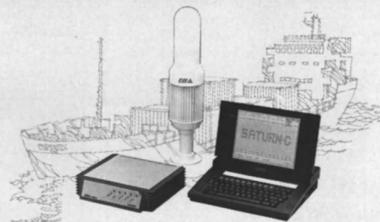


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Allied Shipbuilders

(continued)

The electrical generating system on the Cates 3 comprises two main generator sets, each a 95-kw, 1,800-rpm CAT model 3304 B. The sets are connected for nonparallel operation, with automatic load transfer. One of the many features of this tug is the use of electric power for

the main steering motors and hawser winch. By use of a Mechtronics Series 59000 frequency controller, full variable speed control is obtained on these standard AC motors. All crane and winch functions are controllable from within the wheelhouse, as well as from the foredeck of the tug.

The Cates 3 successfully completed all trials and is now actively in service. As well as demonstrating

the exceptional maneuverability and control associated with the twin Z-drive configuration, the vessel recorded sustained bollard pulls of 34,015 kg ahead, and 30,720 kg astern, and a free running speed of 11 knots.

For free literature on the facilities and capabilities of Allied Shipbuilders,

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Saab Marine Reports Orders Received In Excess Of \$35 Million

Saab Marine Electronics, one of the leading manufacturers of level gaging and cargo-handling equipment for tankers, recently reported that 1990 was their best year ever, with orders received in excess of \$35 million. The company got orders for equipment for 103 tankers. In addition, a large amount of orders for level gaging equipment for refineries and process industries was received.

Korea was Saab Marine's largest market in 1990, followed by Denmark, Italy, Singapore and Japan. Many of the orders were for Scandinavian shipowners. The largest single order during the year was equipment for 15 tankers for the Danish shipowner Terkol.

Eighty percent of Saab Marine's manufacturing capacity has now been booked for 1991.

Saab Marine Electronics is a market leader for level gaging equipment onboard tankers. The system, Saab TankRadar, utilizes a measurement method based on radar technology by which an accuracy of ± 2 mm up to a depth of 60 meters can be achieved. Saab Marine is a member of the Saab-Scania Combitech Group, a company group dedicated to the development of high-tech products for new applications.

For more information and free literature,

Circle 51 on Reader Service Card

Port Of Oakland Names Roberts Acting CEO

Charles R. Roberts, a long-time Port of Oakland executive, has been designated acting chief executive officer by the board of port commissioners.

Mr. Roberts, director of engineering at the port since 1979, succeeds Nolan R. Gimpel, who served as CEO since January 16, 1990.

The vote for Mr. Roberts was unanimous among the five commissioners attending the meeting. Two commissioners were absent.

As director of engineering, Mr. Roberts was responsible for managing all port engineering, project planning, construction and maintenance activities. His department, the port's largest, has a staff of 235 and an annual budget of more than \$11 billion.

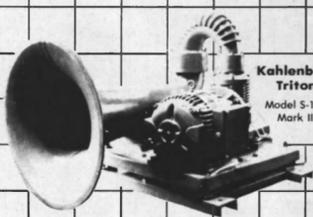
Correction

The downsizing of the Keystone Canyon at the Portland Ship Repair Yard last fall was accomplished solely by Northwest Marine, Inc., and not by a union of PSRY's three contractors as was reported in the January issue. Northwest Marine, Inc. removed 50 feet and 40,000 deadweight tons of capacity from the Keystone Canyon to enable her to trade in Puget Sound and San Pedro Bay.

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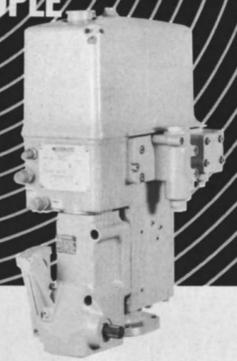
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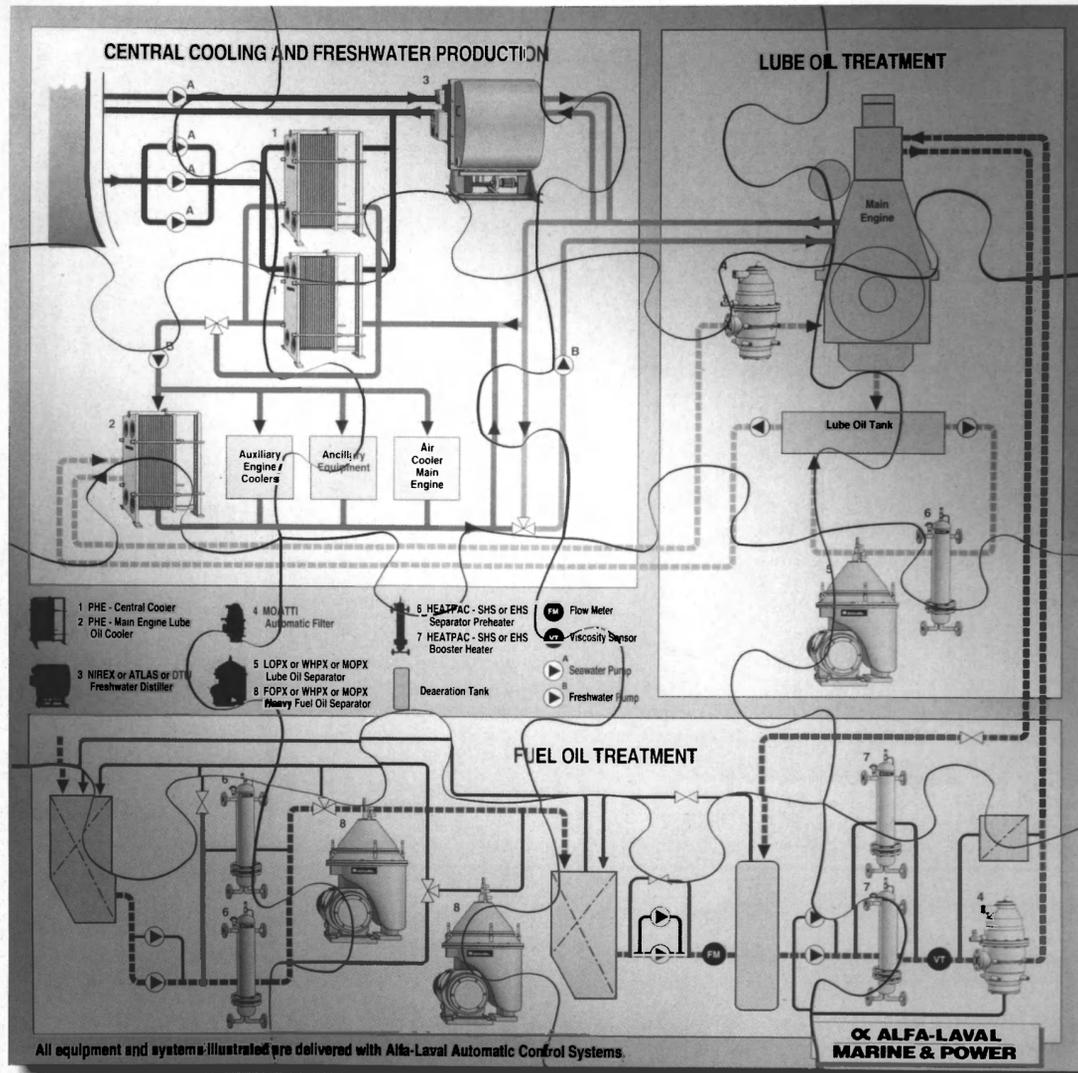
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World Bulk Fleet Expected To Increase Moderately For Next Few Years

For the next few years, the world bulk fleet is expected to increase moderately at an annual rate of about 1.8 percent, according to the research department of the Oslo-based shipbroker and consultant

Fearnleys in its review, World Bulk Fleet January 1991.

Fearnleys expects, based on general market expectations and estimates of shipyard capacity, it will rise to around 516.5 million tons by January 1994, from a figure of 489 million dwt last month.

The tanker fleet may increase from 246.4 million tons to 271.3 tons, and the dry bulk carrier fleet from 211.1 million tons to 214.4 mil-

lion tons. The combination carrier total could decrease slightly from 31.5 million tons to 30.9 million tons.

The predictions assume modest levels of ship demolition, which may be significantly higher than in 1989 and 1990, because of the poor technical condition of several of the older and larger units.

The fleet was augmented by 7 million tons in the second half of

1990 and 7.5 million tons in the first half of 1990. Peak year for the fleet was 1982, when it totaled 520.1 million tons.

The world orderbook for such tonnage decreased by 2.3 million tons during the second half of 1990 to 49.7 tons.

Japan and Korea together accounted for 68 percent of the world orderbook. Japan's increased from 19.6 million to 20.2 million tons, whereas South Korea's decreased from 15.4 million to 13.3 million tons.

During the second half of 1990, worldwide contracting decreased sharply to 6.7 million tons, of which the majority was tankers, at 5.9 million tons, following the first-half total of 20.2 tons (tankers 15.3 million tons, combination carriers 2.1 million tons, and bulk carriers 2.8 million tons).

\$3.5 Million MarAd Contract Awarded Advanced Technology

The Maritime Administration (MarAd) has awarded a \$3,500,000 reimbursable contract to Advanced Technology, Inc., 12005 Sunrise Valley Drive, Reston, Va., to provide coordinated and cooperative research, development testing, and evaluation of new logistics systems and technologies between U.S.-flag carriers in the Cargo Handling Cooperative Program (CHCP) and Department of Defense agencies.

MarAd's Cargo Handling Program addresses advanced materials handling, automation, data processing, and communications technologies to reduce the cargo-handling and documentation costs of intermodal shipments between water and rail or motor carrier transportation modes.

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Lexair Introduces New Three-Way Poppet Type Control Valve

Lexair, Inc. of Lexington, Ky., has introduced a new remote direct pilot-operated three-way poppet valve, with an operating ratio of 5:1 (internal line pressure versus minimum pilot pressure) for unequalled performance of industrial and process control of liquids and gases.

This poppet-type valve provides high flow, positive shutoff operation. Bubble-tight shutoff is accomplished by exclusive poppet seat design that has long lasting, extrusion resistant, soft seal. Ease of maintenance is another important feature, with quick access to valve internal parts without the need for removing from in-line piping.

Valve construction is a bronze body, with brass and stainless steel internal parts. Port sizes are 3/4-inch and 1-inch NPT with optional adapters for female unions and flat face flanges. Working pressures to 500 psi.

For more information and free literature on the new three-way poppet valve from Lexair,

Circle 68 on Reader Service Card

Chantiers de l'Atlantique Wins \$1.3 Billion Petronas Contract For LNG Carriers

Chantiers de l'Atlantique, the French shipbuilder, has won a \$1.3 billion order from the Malaysian state oil company Petronas for five large LNG carriers, scoring a decisive victory for European yards over Far East competition.

During the last few years, Japanese builders have taken the initiative on large LNG carriers from leading European builders, and l'Atlantique was fighting five Japanese yards for this order.

The order marks a return to LNG carrier building for European builders after a gap of seven years. It also marks a return to gas carrier construction for the French yard, which has concentrated, with success, for most of the last decade on the cruise ship market.

Chantiers de l'Atlantique said that despite the absence of orders in recent years, gas carriers and tankers remain one of the three poles of its development strategy, along with passenger ships and navy vessels.

For free literature detailing the facilities and capabilities of Chantiers de l'Atlantique,

Circle 10 on Reader Service Card

ABS Elects New Corporate Officers

At a recent board of managers meeting of the American Bureau of Shipping, the following four new corporate vice presidents were elected: **Walter Czerny**, president of ABS Pacific; **Vincent Roth**, president of ABS Americas; **Robert Somerville**, president of ABS Europe; and **Gary Latin**, head of ABS Information Management Services.

ABS Americas, ABS Europe, and ABS Pacific are operating divisions of the American Bureau of Shipping, a leading ship classification society. These divisions were recently established by ABS in a corporate restructuring plan known as ABS 2000. This plan is designed to increase the depth, efficiency and delivery of ABS services to clients around the world.

The board of managers also elected **Andrew De Stena** senior vice president of the American Bureau of Shipping. He is president of ABS Industrial Verification, Inc., the new subsidiary company formed under ABS 2000 to provide verification services for the engineering, construction, and other nonmarine industries.

Exxon Celebrates Grand Opening Of Port Allen Lubricants Plant

Exxon Company, USA, officially opened its new Port Allen Lubricants (PAL) Plant this month with a grand-opening celebration at the Port Allen, La., site.

April, 1991

On behalf of Exxon, plant manager **Pete Hanberry** announced that the company's new \$50 million blending, packaging and warehousing facility is now fully operational. Festivities included a ribbon cutting ceremony, plant tours, authentic Cajun food and entertainment. Approximately 500 Exxon customers and representatives, suppliers, local government officials and media representatives attended.

The PAL Plant occupies 250,000 square feet on the banks of the Mississippi River across from the Exxon Baton Rouge Refinery. The plant is the company's newest and most technologically advanced facility to date. It has the capacity to ship more than 80 million gallons per year of lubricants and process products including industrial oils, greases, engine oils and solvents.

According to Mr. Hanberry.

"Customer benefits derived from the computer technology and state-of-the-art equipment include consistent high-quality products, on-time delivery, quick turnaround, accurate and timely invoicing and personalized service."

For more information and free literature on Exxon's new PAL Plant,

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BOATS & BARGES

Textron Marine Awarded \$69.1 Million Navy LCAC Order

Yard Completes SES Refurbishment

The only U.S. Navy Surface Effect Ship, the SES-200, recently completed sea trials following her refurbishment at the Textron Marine Systems shipyard in New Or-

leans, La., where she was originally designed and built.

"This 160-foot, advanced technology test bed is capable of speeds over 40 knots, has a range of 2,000



The SES-200, the U.S. Navy's only Surface Effect Ship, is now able to reach speeds in excess of 40 knots, following her conversion, modification and upgrading at Textron Marine Systems' New Orleans shipyard. Her propulsion system now features MTU engines, ZF gearboxes and KaMeWa waterjets.



Textron Marine Systems recently received a \$69.1 million contract for LCAC production work. TMS has already delivered 21 of the air cushion craft, which are used in amphibious operations.

nautical miles and has a significant payload," said John J. Kelly, Textron Marine Systems president. "Its large deck area and below decks volume, along with the excellent motion and stability characteristics of its SES hullform, allow it to be used primarily as a testing platform for government projects, such as evaluating various weapons systems elements. It is ideal for coastal or open water applications," Mr. Kelly added.

The SES-200 is a waterborne, air-supported craft with catamaran-style rigid sidehulls. The SES-200 uses a cushion of air trapped between the sidehulls and flexible bow

and stern seals to lift most of the hull clear of the water. The resulting reduction in drag produces greater efficiency and higher speeds. A portion of the sidehull remains in the water for propulsion and aids in maneuverability and stability of the ship. The air cushion maintains a smoother and better ride with almost none of the slamming characteristics of other conventional craft.

Following her conversion, the SES-200 has an overall length of 162 feet, beam of 41 feet and displacement of 250 tons.

In 1990, a \$1.8 million contract was awarded to Textron Marine Systems by the U.S. Army Corps of

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Quality Products

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Engineers for the conversion, modification, and upgrading of the SES-200 propulsion systems and hull structure.

The conventional propellers and diesel engines were replaced by two MTU 16V 396TB94 diesels using two ZF BW755 gearboxes and driving a twin KaMeWa 71S62/6-SII waterjet system. The propulsion power increased from 3,200 to 6,960 hp and the speed of the SES-200 is now in excess of 40 knots in calm water.

"The conversion has increased maneuverability," said Mr. Kelly, "resulting in reduced underwater radiated noise, and now allows the ship to operate in shallower water."

The SES-200 is homeported at the David Taylor Research Center, located at the Naval Air Station, Patuxent River, Maryland, on the Chesapeake Bay. The DTRC, the Navy's laboratory for advanced naval vehicle development, will deploy the craft in further evaluation programs under the Navy project office PMS300.

In other company news, Textron Marine Systems announced the award of a \$69.1 million contract by the U.S. Navy. The award is for major construction equipment and systems for Fiscal Year 1991 Landing Craft, Air Cushion (LCAC) production and for long-lead construction material for Fiscal Year 1992.

This is the third consecutive year that Textron Marine Systems has been selected as the Navy's lead LCAC contractor to manage the centralized procurement of this equipment.

Textron Marine Systems has delivered 21 LCACs to the Navy, two are currently in test and 22 are in production.

For free literature detailing the construction facilities of Textron Marine Systems,

Circle 57 on Reader Service Card

Tampa Port Authority Names Almeida Chairman

Diana Almeida, director of student services at Hillsborough Community College near Tampa, Fla., was recently elected to serve one year on the port authority board of commissioners. She is the first woman appointed to the Tampa Port Authority.

Other officers elected were **Ron Moore**, vice chairman; **Joseph Caranate**, secretary/treasurer, and **Wade Stephens III**, assistant secretary treasurer.

Viking Introduces New 50-Man Reversible Buoyant Apparatus

Ferries and other ships operating in coastal waters can now benefit from a new 50-man reversible buoyant apparatus. It is a product of Viking, an internationally respected manufacturer of lifesaving equipment for commercial, and recreational craft.

The floor of the apparatus is

April, 1991

placed between two circular buoyancy chambers. Equipped without a canopy, the raft can be boarded as soon as it is deployed and inflated, regardless of which side surfaces.

The Unit meets or exceeds all USCG and SOLAS 1983 Amendment III requirements for design, construction and performance. It also conforms to Viking's tradition of quality by using natural rubber to

coat both the inside and outside surfaces of the rip-stop nylon fabric that is used in the buoyancy tubes and flooring. Natural rubber is best at withstanding extremely low temperatures, including those caused by CO₂N₂ inflation. For added strength, all components are glued together using state-of-the-art material and techniques to ensure durability and safety.

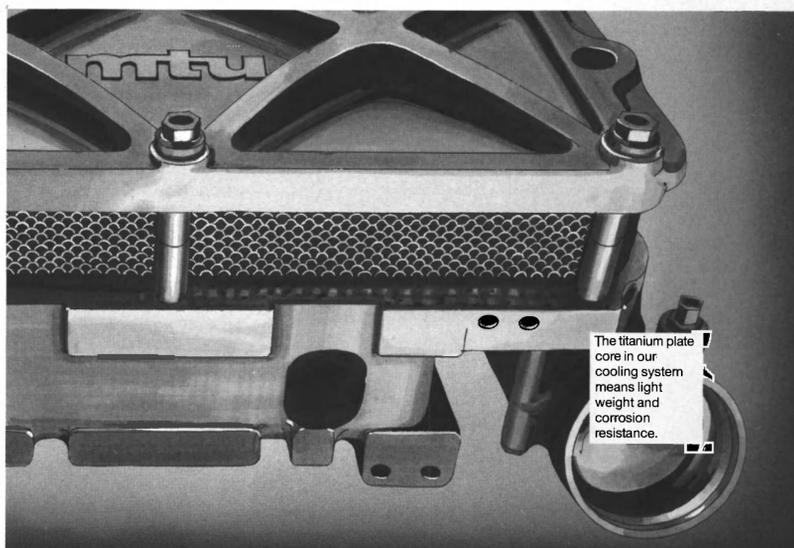
A fixed-type and semiautomatic

cradle are available for the container holding the 50-man buoyant apparatus. The container is easy to clean, completely waterproof and designed to withstand great abuse to provide the raft with long-term protection against virtually any source of damage.

For further information and free literature,

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19

AT&T Awarded \$157 Million Contract To Build Undersea Fiber-Optic Cable —Color Brochure Available

AT&T has been awarded a \$157 million contract to build a new undersea fiber-optic cable that will link the U.S. mainland to Hawaii in 1993.

Known as Haw-5, the cable is the fifth to link Hawaii to the mainland and the second fiber-optic cable to do so.

The cable, which will carry voice and data traffic, includes three pairs of fiber, two active and operating at 560 megabits per second and one fiber pair for reserve. If the entire cable were used for voice, it could handle 80,000 simultaneous telephone conversations.

The world's first transoceanic lightwave system, TAT-8, went into service in 1988 and has a capacity of 40,000 simultaneous telephone calls. TAT-9, to be deployed in 1991, will handle 80,000 simultaneous calls.

A new fiber-optic cable would

have a capacity of 600,000 simultaneous conversations using optical amplifiers and operating at 2.4 gigabits (billion bits per second) over two pairs of fibers and using conventional compression techniques.

AT&T Bell Laboratories scientists are experimenting with optical amplifiers in ultra-long-distance systems and in systems for island-to-island or coast-to-coast transmission. Related research involves high-repetition lasers, pump lasers, all-optical logic elements, integrated optical waveguide devices, and new types of optical fiber.

AT&T also announced that it is adding a \$6 million robotic Seabed Tractor to its stable of undersea cable laying equipment. The 10-ton vehicle can begin burying cable at the top of a beach, drive through the surf and continue laying cable until the water is almost a mile deep.

Undersea cable is buried in a trench about 3 feet deep. When trenching, the hydraulic-powered Seabed Tractor travels at speeds ranging from 3 to 15 feet per minute, and can reach speeds up to 150 feet per minute when not trenching.

The Seabed Tractor, which is

manufactured by Soil Machine Dynamics in Newcastle, U.K., will be stationed in Baltimore.

For further information and a free copy of the brochure on submarine cable systems from AT&T,

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NEI Syncrolift Wins Over \$3 Million In Orders For Shiplifts, Transfer Systems

NEI Syncrolift of Miami, Fla., a world leader in shiplift technology, has received two more orders for shiplifts and transfer systems valued in excess of \$3 million.

One order for an eight-hoist unit with a lifting capacity of 1,150 tons was placed by the TOA Corporation of Japan. The Syncrolift, for installation at Port D'Agadir in the Kingdom of Morocco, is to be used for the docking of fishing vessels.

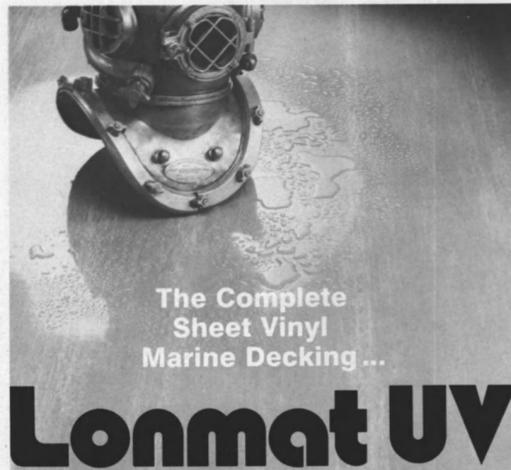
The second order, for an 1,860-

ton unit, was placed by Etermar of Lisbon, Portugal, for a Syncrolift Shiplift and Transfer System for installation on the Island of Madeira, off the coast of Portugal.

These new orders bring to 190 the number of Syncrolifts installed or under construction in 63 countries around the world. Currently, there are nine new Syncrolifts under construction in Europe, Japan, the Middle East, Africa and in the Pacific. The largest of these is capable of handling vessels of up to 100,000 dwt, while the smallest lifts less than 300 tons.

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OTC 91

A Preview

Offshore Technology Conference And Show Set For May 6-9 In Houston, Texas

One of the world's foremost international showcases for offshore services and equipment annually for the past 22 years, the Offshore Technology Conference (OTC) is a leading worldwide forum for the serious exchange of information regarding the development of offshore resources and protection of the offshore environment. Nearly one million registrants from more than 100 countries have attended the combined technical programs and exhibitions of OTC since its inception in 1969.

This year's show, OTC '91, is slated for May 6 to 9 at Houston's Astrodome complex, site of the Astrodome. More than 30,000 managers, engineers and scientists from around the world are expected to attend and more than 1,200 leading manufacturing and service companies will market their latest technology to industry leaders who seek techniques and tools that can make a difference to their bottom line.

For example, the overwhelming consensus—from registrants, exhibitors, authors, panelists and the media—is that the 1990 OTC was the best in years, if not ever. Attendance was 31,451, the largest since 1985. Net occupied exhibit space increased by 25,000 square feet, to 210,000 square feet.

Equally important was the positive attitude that pervaded all aspects of the conference. "OTC is the best show I've been to, both in numbers and quality," said **Mike Kiefer** of Whittaker Corp.'s Electronic Resources Division. "I haven't

been to a show where we've made deals more substantial than the three we made here," he said.

Sea Level Supply Inc.'s **M. Kent Crawford** commented, "The quality of people who come to OTC can't be beat. We see people here that we've been trying to see for years."

With about 275 technical presentations by authors from 20 countries, as well as an exhibition showcasing the latest products, equipment and services of over 1,200 companies, OTC '91 is expected to surpass the success of the 1990 show.

"Much of the earth's future energy supplies lie beneath the oceans. The key to developing these supplies is a combination of ever-expanding knowledge, sophisticated equipment and unyielding commitment to human and environmental safety," said OTC program chairman **Cor Langewis** of Conoco Inc. in New Orleans.

Subjects to be explored at OTC '91 include oil spill response and mitigation, tanker safety and regulations, riser systems, platform concepts and designs, pipelining, corrosion, and more. The Freeport McMoRan Sulphur, Snorre, TOGI, and Santa Ynez Unit projects are among the individual developments to be covered. In addition, political and economic considerations will be important parts of the program agenda.

Two special management sessions will feature perspectives from industry executives and government officials and are expected to draw extra attention Tuesday and Wednesday, May 7-8. Tuesday after-

noon's "Future Directions in Offshore Technology—Deep Water and Frontier Areas" will focus on future worldwide offshore opportunities and challenges and the new technologies that will be required to bring new projects to fruition. Wednesday morning's "Offshore Safety—The Regulatory Environment" will address recently enacted regulations and discuss proposed steps to enhance further safety and environmental measures in offshore operations. The discussion will include industry and government responses to major safety studies, including the findings of the Cullen Enquiry, an extensive 13-month review of the July 1988 Piper Alpha accident in the U.K. North Sea.

John Wakeham, the U.K. Secretary of State for Energy, will be the keynote speaker at the Tuesday OTC Awards Luncheon. Mr. **Wakeham** will discuss future offshore development and energy policies for the U.K. Continental Shelf, which remains the world's most active offshore operating area.

The seven OTC topical luncheons, scheduled Monday and Wednesday, May 6 and 8, will offer registrants opportunities to learn details of current offshore developments, forecasts for future operating environments, new concepts for increasing ocean awareness and an assessment of clean-up operations in Prince William Sound.

On Monday, **C.D. Sabathier**, Mobile area producing manager for

(continued)



OTC '91

(continued)

Mobil Oil Corp. in New Orleans, will discuss the unique exploration and production challenges of the Gulf of

Mexico's Mobile Bay Region in his address, "Mobile Bay: An Extraordinary Challenge."

Rear Adm. **James M. Loy** of the U.S. Coast Guard will examine the various tools used in oil spill containment and clean-up operations in the aftermath of the June 9, 1990, Gulf of Mexico incident in his luncheon address, "The Mega Borg Incident."

On Wednesday, **Jerry Dees**, vice president of exploration for Arco Alaska, Inc., in Anchorage, will address the challenges and opportunities that exist in the largely unexplored high arctic offshore basins at the luncheon entitled, "Offshore Arctic Potential."

Steve Clifford of the Lunar and Planetary Institute in Houston will discuss evidence both for and against



global warming caused by human activity in his address on "The Greenhouse Effect."

A panel of industry executives representing both drilling contractors and operators will discuss the design and operational challenges of drilling in water depths of 10,000 feet and deeper at the luncheon on "The Challenges of Ultra Deepwater Drilling."

And finally, **Otto R. Harrison**, Alaska operations general manager for Exxon Company USA, in Anchorage, will present his company's perspective on the Exxon Valdez tanker accident that occurred in Prince William Sound on March 24, 1989, in a luncheon address, "Valdez Revisited—The Rest of the Story." Mr. **Harrison** will assess the clean-up operations of the resulting oil spill as well as share the findings of scientific studies on what lasting effects, if any, the oil spill will have on the region. He will also discuss lessons learned in the aftermath of the incident and assess technologies developed to aid clean operations.

Eleven prominent engineering and scientific organizations, with worldwide membership of more than 700,000 people, sponsor the technical conference and exhibition each year in Houston. The Society of Petroleum Engineers, Inc., manages the event for the other OTC sponsoring organizations.

For further information of the technical program and conference exhibition, contact OTC Headquarters, P.O. Box 833868, Richardson, Texas 75083-3868; telephone: (214) 669-0135.

Conference Schedule At A Glance

Monday, May 6	
Registration	8 a.m.-4:30 p.m.
Exhibition	8:30 a.m.-5 p.m.
Technical Sessions	9 a.m.-Noon 2-5 p.m.
Topical Luncheons	12:15-1:45 p.m.
Tuesday, May 7	
Registration	8:30 a.m.-4:30 p.m.
Exhibition	8:30 a.m.-5 p.m.
Technical Sessions	9 a.m.-Noon 2-5 p.m.
Topical Luncheons	12:15-1:45 p.m.
Wednesday, May 8	
Registration	8:30 a.m.-4:30 p.m.
Exhibition	8:30 a.m.-5 p.m.
Technical Sessions	9 a.m.-Noon 2-5 p.m.
Topical Luncheons	12:15-1:45 p.m.
Thursday, May 9	
Registration	8:30 a.m.-3 p.m.
Exhibition	8:30 a.m.-3 p.m.
Technical Sessions	9 a.m.-Noon

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OTC '91

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OTC '91
TECHNICAL PROGRAM
(Session Topics)

Monday, May 6
9 a.m.-Noon

- "Platform Concepts and Designs"
- "Platform Construction and Installation."
- "Safety and Oil Spill Control."
- "Mineral Exploration and Mining Systems."
- "Subsea Wellheads and Systems."
- "TLPs."
- "Offshore Stratigraphic Traps and Ocean Drilling."
- "Drilling Technology Applications."

12:15-1:45 p.m.—Topical Luncheons—
"Mega Borg Incident," by Rear Adm. **James M. Loy**, USCG; "Mobile Bay: An Extraordinary Challenge," by **C.D. Sabathier**, Mobil Oil Corp.; and "Auger and Beyond," by **C.L. Wickizer**, Shell Offshore Inc.

2-6 p.m.
• "Design and Analysis of Bottomfounded Structures."
• "Offshore Platform Repair and Salvage."

- "Foundation and Soil Structure Interaction."
- "Wave and Current Forces."
- "Diverless Maintained Subsea Systems."
- "Oil Spills: Response and Mitigation."
- "Estimation & Practical Use of Seismic Velocity."
- "Mooring Design and Analysis."

Tuesday, May 7
9 a.m.-Noon

- "Non-Metallic Materials and Offshore Use."
- "Marine Corrosion."
- "Flexible Pipe Technology."
- "Response to Wind, Wave & Currents I."
- "Freeport McMoran Main Pass Mine Development: Structures & Subsidence Design."
- "Wind and Wave Environment."
- "Borehole Seismic Imaging."
- "TOGI Project."

12:15-1:45 p.m.—Awards Luncheon—
Rt. Hon. **John Wakeham**, U.K.'s Secretary of State for Energy, is the keynote speaker. Awards to be presented include the "1991 OTC Distinguished Achievement Award for Individuals" and the "1991 Distinguished Achievement Award for Companies, Organizations and Institutions."

2-5 p.m.

- "Exploration Geoscience."
- "Mitigating Offshore Corrosion Problems: Various Techniques."
- "J-Pipe Laying in Deep Water."
- "Response to Winds, Wave & Currents II."
- "Freeport-McMoran Main Pass Mine Development: Mine Technology, Production."
- "Drilling Operations & Equipment."
- "Jackup Design & Analysis."

Wednesday, May 8
9 a.m.-Noon

- "Environmental Assessment: Instrumentation."
- "Instrumentation & Control."
- "Subsea Pipeline Design & Construction."
- "Safety of Riser Systems I."
- "Completion Operations & Equipment."
- "Snorre Project."
- "Santa Ynez Unit Project I."

12:45-1:45 p.m.—Topical Luncheons—
"Offshore Arctic Potential," by **Jerry Dees**, Arco Alaska Inc.; "The Greenhouse Effect," by **Steve Clifford**, Lunar and Planetary Institute in Houston; "The Challenges of Ultra Deepwater Drilling," will be a discussion by a group of panelists representing both drilling contractors and operators; and "Valdez Revisited—The Rest of the Story," by **Otto R. Harrison**, Exxon Company USA.

2-5 p.m.

- "Environmental Assessment: Operation."
- "Geophysical Data Acquisition & Processing."
- "Pipeline Stability Analysis."
- "Blast and Fire Resistance Design."
- "Tanker Safety/Tanker Regulations."
- "Santa Ynez Unit Project II."

Thursday, May 9
9 a.m.-Noon

- "Mechanical Connections."
- "Multiphase Metering and Subsea Separation."
- "Pigging of Underwater Pipelines."
- "Welding and Corrosion Pipelines."
- "Risk and Reliability Assessment."

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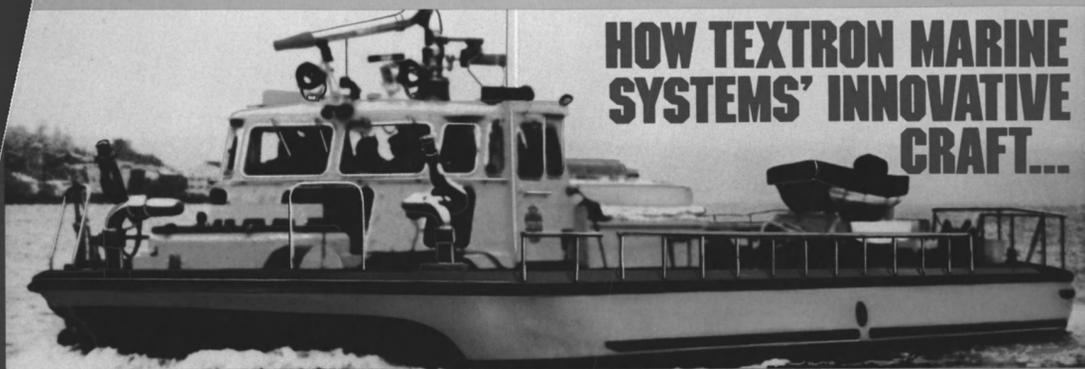
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Balancing The National Energy Strategy

By Charles J. DiBona, President
American Petroleum Institute

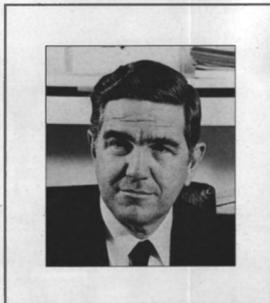
This past February, the Administration released its long-awaited National Energy Strategy, laying out a range of options for federal energy policy that could reduce the nation's dependence on imported oil, especially from unstable sources like the Mideast. The proposal contains programs designed to increase the nation's domestic energy production, to improve the efficiency of energy consumption, and to encourage the use of alternative fuels.

Yet today these options are being hotly debated—and many policymakers object to proposals that would increase domestic energy production, in particular the exploration and development of a small portion of the Arctic National Wildlife Refuge (ANWR) and those portions of the outer continental shelf that were not closed off to oil and natural gas leasing by the Administration last July. Instead, they are proposing that more aggressive conservation measures and the greater use of alternative forms of energy be used as substitutes for the domestic production of oil.

In fact, however, many of these proposals are unrealistic in economic terms—they do not take into consideration the real costs of conservation and alternative fuel measures. Before the nation adopts any energy policy, it must ask if it is possible for the United States to change its consumption and investment patterns so it will be able to halt growth in—or reduce—energy consumption while maintaining a reasonable rate of economic growth and a broad array of choices for its citizens. Similarly, it must realistically assess the economic and technological viability of fuel switching.

Energy policies which mandate changes in America's energy habits will necessarily bump up against fundamental economic realities: first, that the nation depends on the output of its industries and cannot quickly or easily change the energy-using capital equipment that runs them. Second, that it relies on a complex transportation network for commercial and private vehicles. And, third, that it cannot quickly or easily change the tens of millions of private investment decisions ordinary citizens have chosen to make on the location and size of their homes, the number and kind of automobiles they own, and how they get to work.

While cost-effective conservation is an important part of any energy strategy, aggressive conservation measures that seek to reduce en-



Charles J. DiBona

ergy consumption without regard to the burden they impose on the economy and consumers can be counterproductive.

API has closely studied the cause-and-effect relationship between energy demand and economic performance, and we have found that maintaining constant energy use with a growing economy would be painful to Americans and, as a practical matter, difficult to achieve. Just to hold U.S. energy consumption constant at 1987 levels through the year 2000, the overall price of energy—the weighted average of the prices for oil, natural gas, and coal—would have to rise, in real terms, to three to four times its current level. That means that real energy prices (in 1990 dollars) would have to rise, at least within the United States, to as much as \$55 per barrel in oil equivalent terms over the period.

To reduce aggregate U.S. energy consumption by 10 percent in the same time frame, the real weighted average energy price would have to rise to five or six times present levels, or to as much as \$87 per barrel. Of course, these dollar amounts represent the average price of all energy—the actual price of oil would be even higher.

These higher energy prices could dramatically slow economic growth and therefore reduce the disposable income of all Americans. Even small differences in economic growth rates, if they persist, result in large differences in absolute family income over the long term.

If the nation were to reduce energy use by as much as some have urged through government-imposed limits, normal rates of economic growth could be maintained only if the "saved" energy was replaced through an increase in the propor-

tion of GNP going for investment.

This increase in investment would have to be on the order of 50 percent—that's approximately \$500 billion of aggregate investment—and consumption of goods and services would have to be reduced by about 16 percent.

From this, it is clear that the conservation goals being proposed would require enormous sacrifice on the part of individual Americans, if economic growth is also to continue. If instead we accepted slower economic growth rates, there would be fewer jobs and a reduced standard of living.

Similarly, alternative fuels must play a key role in any balanced energy policy—but to be effective they must be affordable and technologically viable. Proposals that simply mandate the widespread introduction and use of alternative fuels ignore the technical and economic aspects of introducing these fuels, including the costs of changing the infrastructure of the U.S. transportation system.

Many oil companies have a large stake in alternative fuels research and development, including solar energy, hydrogen, shale, coal gasification, geothermal energy, and new uses for electricity as a source of transportation energy. Yet all these alternatives are currently constrained by economic, environmental, or technological limitations—and, although they have been on the market for quite a few years, their combined share of our energy market is still less than 1 percent. If the United States is to maintain a healthy and growing economy, it must not force uneconomic alternative fuels into use. Achieving our nation's goals for economic growth requires that alternative fuels satisfy cost-effectiveness criteria.

Clearly, both uneconomic conservation measures and the widespread mandating of expensive alternative fuels would have a punitive effect on the U.S. economy and on the lives of American citizens. It is clear that if the United States seriously wishes to reduce its dependence on insecure sources of imported oil and at the same time maintain a healthy economy, it must take steps to increase opportunities for domestic oil and gas production. Unfortunately, recent trends have gone the other way, and domestic oil production has continued to fall—by more than 25 percent in the past 10 years—to 7.2 million barrels a day.

The Administration's proposals are a start towards turning this

trend around. It has proposed that the coastal plain of Alaska's Arctic National Wildlife Refuge be opened to oil and gas leasing. It has proposed responsible exploration and development of portions of the outer continental shelf—though not those most promising offshore areas of California, Florida, and other states that were closed this past July. It has proposed leasing of Naval Petroleum Reserves and oil pipeline deregulation. And it has proposed options that would increase natural gas use.

Over the next 10 years, for example, untapped domestic reserves of oil and natural gas on government lands could add the equivalent of from 2 million to more than 4 million barrels of oil a day to domestic production. That is a significant amount. During the last week of this past January, for comparison, U.S. oil imports totaled 6.6 million barrels a day.

At the same time, development of these reserves will help strengthen the economy. In ANWR alone, the amount of oil that potentially could be found will make the costs of exploration and development economically feasible. Moreover, according to a recent economic analysis prepared by Wharton Econometrics Forecasting Associates, developing ANWR coastal plain oil could boost the gross national product by \$50.4 billion and increase employment nationwide by about 735,000 jobs by the year 2005. That study predicted that ANWR oil development would "stimulate U.S. investment, moderately temper the growth in world oil prices and significantly reduce U.S. petroleum imports and improve the U.S. trade balance."

Opening the ANWR coastal plain to environmentally sound exploration and development is clearly one of the Administration's most important energy initiatives, as it can serve not only to reduce the nation's dependence on imported oil, but also to bolster the nation's economy. At the same time, we hope and expect that this proposal could open debate on a similarly positive approach to development of parts to the nation's outer continental shelf that have been placed off limits by government leasing moratoria.

These are goals worthy of a national energy strategy. We can only hope that as Congress debates and evaluates the Administration's options, it will reach a consensus on positive, realistic steps that will contribute to the nation's energy security and economic well being.



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low draw
12 volt system
drawing 6 amps
or 110 volt
drawing 10 amps

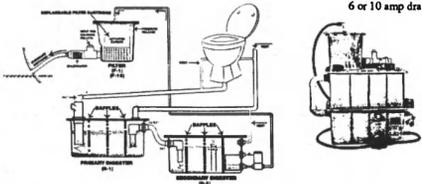
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Sewage flows from the head directly into the Digester(s) where it makes its way through a series of baffles. It is broken down and dissolved by natural bacterial action during this stage. The resulting liquid (effluent) is then pumped through the Filter 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 Mus, No Fuss!

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.

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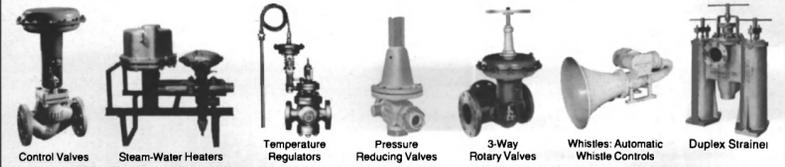
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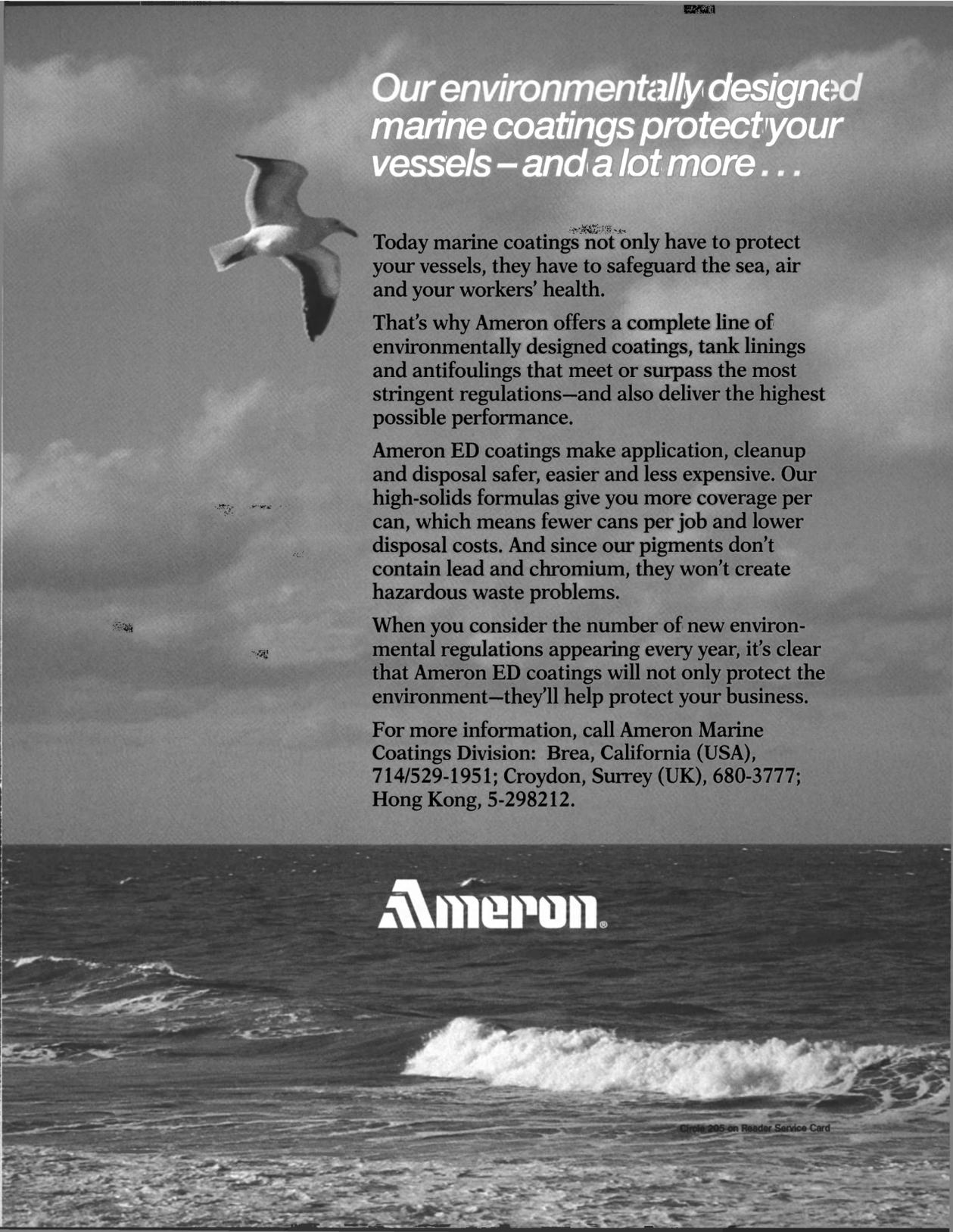
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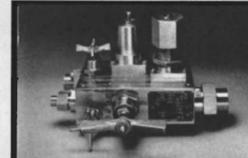
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The 160-foot crewboat Deanne McCall is powered by six Cummins diesel engines to a speed of 24 knots.

Gulf Craft Delivers 160-Foot Aluminum Crewboat For U.S. Gulf Operator

U.S. Gulf of Mexico operator McCall Enterprises has taken delivery of its seventh 160- by 30-foot crewboat, the Deane McCall, from Gulf Craft, Inc., of Patterson, La. The multipurpose Deanne McCall is powered with six Cummins KTA-19M diesel engines that

develop a total of 4,080 hp and propel the vessel to a speed of 24 knots. She is Coast Guard approved for 83 passengers and has a cargo deck capacity of 180 long tons on her 92- by 26-foot back deck. In addition to deck cargo, the Deanne McCall is capable of offloading 43,000 gallons

of water and 13,000 gallons of fuel oil. She also has the capability to fight fires with her 600 gpm fire pump and deck mounted fire monitor.

The vessel's five-man crew lives in central air conditioned and heated comfort and is quartered in three staterooms, with a bathroom and galley located below deck and isolated from the passenger space.

The multimission crewboat is fitted with an array of electronics consisting of two Furuno radars, Stephens single sideband radio, two Raytheon VHF radios, Raytheon Loran, Datamarine depth indicator, and Comnav Marine autopilot.

For free literature detailing Gulf Craft's boatbuilding capabilities,

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VHF radios	Raytheon
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Depth indicator	Datamarine
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Furuno/Steenhans Shipboard Communications



Furuno now offers Steenhans rugged, commercial-quality shipboard communications equipment for the U.S. market: the System P-4200 battery-less telephone, and the System PK Command Intercom.

The P-4200 provides reliable communications for up to 24 stations, even if all other shipboard power fails, and a wide variety of station styles are available. Operation is very simple: turn the handle on the telephone set a few times for ringing signal and approximately five minutes of conversation. If more time is required, turn the handle again.

The System PK provides top quality voice communications between the bridge and up to 40 individual locations aboard ship. Standard packages are 5, 10 and 20 lines, and various types of substations are available to meet almost any conditions: indoor/outdoor, high noise, or wet locations.

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Southwest Marine Reports Upturn In Ship Repair And Conversion Business

The Southwest Marine Group, with facilities in San Diego (its headquarters), San Pedro (Los Angeles), San Francisco, Portland (Northwest Marine) and Samoa, reports that the Group is experiencing

an upturn in commercial ship repair and conversion business.

One of the most important projects is the \$75 million refit of the Royal Caribbean Cruise Line's Viking Serenade, which is being undertaken at the San Diego facility with some prefabrication work being done in the Portland facility. This contract is scheduled for completion this month.

In Portland, Northwest Marine

(now a division of Southwest Marine) carried out a capacity reduction on the U.S. tanker Keystone Canyon which involved the removal of a 50-foot midbody section, reducing the deadweight to around 125,000 tons. Also being handled in Portland is a major refurbishment of the Alaska State ferry Tustumina. A major upgrading of the Sealand Hawaii has been completed. The conversion of two Matson Navi-

gation vessels from RO/RO to combination container vessels was also undertaken in San Francisco.

San Pedro undertook drydockings of two fruit carrying vessels, and the Group has also handled a number of cruise vessels and tanker drydockings.

The Group, which historically has been involved in the U.S. domestic market, is now also generating international business through an upgraded network of overseas agents.

For free literature on the facilities and capabilities of Southwest Marine Group,

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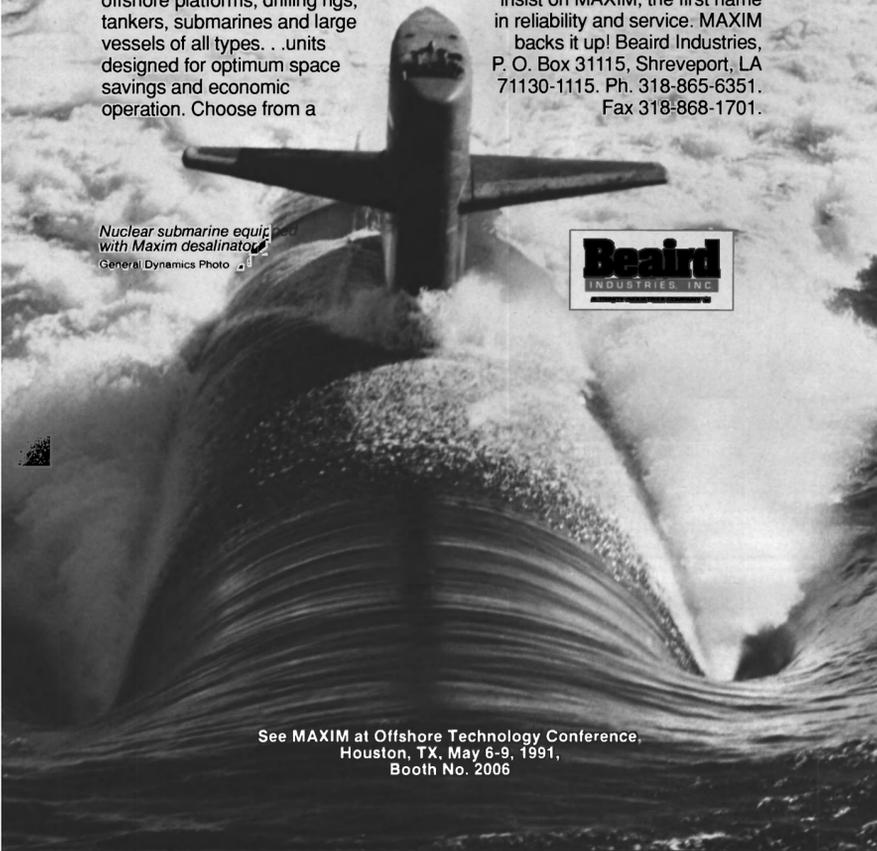
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Nuclear submarine equipped with Maxim desalinator. General Dynamics Photo.



See MAXIM at Offshore Technology Conference, Houston, TX, May 6-9, 1991, Booth No. 2006

BFGoodrich Selects Coppedge Representative For Marine Products

Coppedge Marine & Industrial has been selected by BFGoodrich Engineered Polymer Products as its manufacturer's representative for the Florida territory.

Coppedge will handle Cutless® bearings as well as shaft sleeves, bumpers and related marine product lines supplied by BFGoodrich.

Established as a manufacturer's representative firm in 1982, Coppedge Marine & Industrial is headquartered in Jacksonville.

Engineered Polymer Products, also based in Jacksonville, is a business unit of BFGoodrich Aerospace, a division of The BFGoodrich Company, Akron, Ohio.

For further information and free literature on Cutless bearings, shaft sleeves, bumpers, and other product lines supplied by BFGoodrich,

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Kim Hotstart Receives ABS Certification —Literature Available

Kim Hotstart Manufacturing Co., Spokane, Wash., has received certification from the American Bureau of Shipping (ABS).

The certification applies to Kim Hotstart equipment used in both government and private industry. The company is a manufacturer and international distributor of engine pre-heating equipment.

The company was notified that it is now listed in the 1991 supplement of the List of Type Approved Equipment. The company will also be listed in the 1991 manual to be published later in the year.

"The certificate expresses our confidence in your product and facilities," wrote John A. Osterberg, senior engineer in the ABS Type Approval Section-Machinery, based in Paramus, N.J.

ABS certification is recommended for most ships going in for repair, particularly when new equipment is being installed. Many insurers also recommend the ABS designation before approving coverage.

For more information about ABS-certified Kim Hotstart equipment,

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American Ship Building Awarded Navy Contract For Up To Six Ocean Surveillance Ships

The American Ship Building Company Announced recently that the U.S. Navy has awarded the company a contract for the construction of up to six Ocean Surveillance Ships. The eventual contract value for construction of these vessels, which are designated T-AGOS 23-Class ships, is approximately \$300 million.

American Ship chairman **George M. Steinbrenner** said design and procurement work will begin immediately at The American Ship Building Company's Tampa Shipyards Division on the initial phase of the contract, which calls for delivery of the first ship in 1994.

"This is very exciting news for both the company and the Tampa Bay area," Mr. Steinbrenner said. "Not only does this breathe new life into Tampa Ship, but it will also have a tremendous economic impact on the Tampa Bay area at a time when this area sorely needs

such an infusion."

The company expects that more than 500 new workers will be needed to supplement its present labor force at the Tampa Shipyards facilities. Hiring of engineers, designers and planners will begin immediately, with production trades added by early 1992. "We are deeply appreciative of the U.S. Navy's confidence in the ability of American Ship to perform on this contract," added Mr. Steinbrenner.

Continuation of the contract, which presently calls for completion of the six ships by 1997, will be at the discretion of Congress as it approves the U.S. Navy ship construction program each year. The Navy is considering plans to construct approximately 15 to 20 of these vessels.

Alan B. Nierenberg, president and chief operating officer of The American Ship Building Company, said the award of this contract es-

tablishes a solid backlog of work that will serve to stabilize the future of Tampa Shipyards. "We can now begin to look to complementary commercial marine repair and new construction work as a supplement to ongoing military activity. This contract definitely establishes Tampa Ship as a part of the nation's military industrial base. This is an exciting time for American Ship and for the Tampa Bay industrial community," he added.

Mr. Nierenberg said the contract will allow the company to substantially increase its manpower and capabilities for the next five to six years. Seventy-five percent of construction will take place at Tampa Shipyards' Westshore facility, where crews will assemble large pre-outfitted modular sections of the ships. These modules will then be barged to Tampa Shipyards' Hookers Point facility for final assembly and ship testing.

The T-AGOS ships will be manned and operated by the Military Sealift Command, under contract from the Naval Sea Systems Command. The T-AGOS 23-Class vessels will be larger than existing ships now under construction by the U.S. Navy for ocean surveillance.

The ships will be built with a

SWATH (Small Waterplane Area Twin-Hull) configuration that provides a more stable platform for accomplishing oceanographic missions in heavier seas. The T-AGOS 23-Class represents the second phase of ocean survey vessels being built for the Naval Sea Systems Command.

Mr. Nierenberg said the benefit of such a large and stable contract will allow American Ship to be more competitive in bidding for commercial and offshore ship repair work, while giving it added strength in the ongoing competitive battle for additional U.S. Navy ship contracts.

The T-AGOS 23-Class ocean surveillance ships have a length of 281 feet 6 inches, beam of 95 feet 9 inches and design draft of 26 feet. Depth, main deck at amidships is 55 feet 4 inches; displacement at design draft is 5,368 long tons.

Propulsion for the T-AGOS 23-Class vessels is provided by two diesel-electric machinery units rated @ 2,500 Hp each, with two 15 ft. fixed-pitch propellers.

The ships are designed to carry a crew of eight officers, four enlisted personnel and 33 civilians.

For free literature giving full information on American Ship, **CIRCLE 49 ON READER SERVICE CARD**

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Shipbuilding Surge Predicted For 90s

Report On SCA Seminar On World Shipbuilding

An aura of optimism, albeit a cautious one, permeated the conference room at the recent second shipbuilding and repair program sponsored by the Shipbuilders Council of America.

The very first speaker, **Dennis Stonebridge**, director of Drewry Shipping Consultants, London, acknowledged that a "relatively rosy scenario" in 1989 and the first half of 1990 was "heavily tarnished" by the Middle East war is resolved this year, "the outlook for shipbuilding and related industries is encouraging." The successful conclusion of the war in March after the meeting adds substantially to Mr. Stonebridge's positive assessment.

Before Mr. Stonebridge spoke, however, **John Stocker**, president of the SCA, struck a cautious note in introductory remarks warning that his industry was at a "cross roads."

"It's very important for us to begin the process of moving away from our overdependence on the Navy as our only customer," Mr. Stocker said. The SCA president said it was not simply a question of "redirecting" shipyard marketing programs, "but a question of how we interact with our government to ensure that policies pursued by our government give us a fighting chance in the market competing against (foreign) shipyards that have received extensive government support in the past." That is why,

he said, the industry petitioned the U.S. Trade Representative in 1989 to enforce sanctions against countries subsidizing their shipbuilders and then agreed with the government to pursue instead an international agreement ending such practices.

Mr. Stonebridge summed up his presentation at the start of the two-day conference by saying he expects a high level of demand, possibly a boom in the second half of the decade. Prices, he said, will continue upward and Japan and South Korea will continue to be market leaders.

Echoing Mr. Stonebridge's optimism was **S. Linn Williams**, Deputy U.S. Trade Representative, who, as guest luncheon speaker on the first day of the two-day seminar, said that while there were few reasons to be optimistic about commercial ship construction in the last decade, "there are reasons for optimism today."

One reason, Ambassador Williams said, is "the growing markets for commercial ships." Another is the government's efforts "to improve competitive conditions in shipbuilding, and therefore your access to those promising markets."

As for the government's decision to try to negotiate a multilateral agreement to eliminate foreign shipbuilding subsidies, Mr. Williams said there are "significant hurdles" still to be overcome but that the negotiations "are coming to a head."

He believes that a multilateral agreement is the U.S. industry's best opportunity for gaining access to the growing demand for ships worldwide.

The question of how to finance the construction of a new fleet of ships in the decade ahead was raised by **Paul Slater**, chairman and chief executive officer of the First International, a group of companies that specializes in maritime finance, investment and leasing. It was Mr. Slater's contention that if the aging world fleet is to be replaced "then it is vital that a major reappraisal of funding techniques be undertaken without delay." He envisioned a new approach that features establishment of "financial ship-owners or leasing companies."

The main benefit that leasing provides, Mr. Slater said is "the financially effective separation of the costs of owning and operating assets, i.e. the ships."

Some of the statistics offered by Mr. Slater showed that by the year 2000, more than 21,000 new vessels will have to be built to take care of trade growth demand and fleet replacements. He estimated that while this level of construction would cost more than \$250 billion, most public and private shipping companies do not have the equity base or equity capital to finance it.

What is needed to finance such construction, he said, is an approach "combining the expertise of financial shipowners with the bankability of cash flows generated by long-term movement of cargoes."

The establishment of leasing companies, he said, will bridge the gap between an industry seriously deficient in capital and the major financial markets.

James Godson, president of Cruise Lines International Association, said he was "bullish" about the cruise industry and expected it to continue to grow "at a very rapid rate." He cited product satisfaction, repeat business, modern ships, heavy involvement with travel agents, and diversified activities offered aboard ship as some of his reasons for optimism.

He stated that the cruise industry expects to add 42 ships through 1994 to the 113 it now operates.

Capt. **Aage Linstad**, vice president for marine operations of Royal Caribbean Cruise Line, said that all of RCCL's drydocking is done in the U.S., and indicated RCCL, which markets 7 ships in the U.S., will add another 2 ships by 1993. Captain Linstad said, "the overall trend is positive for further expansion with new tonnage as in the 1980s."

He noted that the company is currently engaged in an \$80 million conversion of the Viking Serenade at Southwest Marine, Inc., San Die-

go. The work will increase the capacity of the ship from 960 to 1,510 passengers.

Ben Hackett of Stonehill Consultants, London, tried to give the shipbuilders an idea of what kind of business to expect from bulk operators.

"Unless building yards reduce their price or repair yards increase theirs by very significant margins," Mr. Hackett said, "it is highly probable that life extension (of a bulk vessel) will remain overwhelmingly attractive in commercial terms."

Turning to legislative and environmental factors, Mr. Hackett noted that even though there is a shortage of double-skinned tankers for crude imports there is little reason for oil companies to enter immediately into a large construction program because "the U.S. oil pollution act is full of loopholes," referring to the bill's long phase-in period.

Dealing with financing of ship construction was **Richard C. Houseworth** of the Export-Import Bank of the United States. Mr. Houseworth said that commercial demand "has increased dramatically with the aging of the world shipping fleet. Ship prices have more than doubled in the past two years so that, despite foreign subsidies, the gap between U.S. and foreign prices is closing fast."

Mr. Houseworth also thought that the government is "very optimistic" about the outcome of negotiations to eliminate ship production subsidies and reduce export financing subsidies. If they succeed, he added, "the financing gap can be closed."

Mr. Houseworth said that while Eximbank supported \$9.5 billion in U.S. exports to over 100 countries in 1990, it has not participated in financing U.S. shipbuilding for many years.

"But we stand ready to do so," he added. "We have no prohibition on shipbuilding finance. Eximbank is prepared to consider financing for U.S. exports of new ships and major rehabilitations."

Frank Paine, president of Frank Paine & Associates, Stamford, Conn., predicted that in a few years, "one will be able to build a tanker in the U.S. for only about 10 to 20 percent premium over the Japanese and Korean prices."

Capt. **David L. Wood** of the DLW Group, Wilton, Conn., also pointed out that with the declining value of the dollar and rising comparative labor costs overseas, "there is a clear indication that U.S. shipbuilding and ship repair yards are becoming more and more competitive with, for example, yards in North Europe, Japan, Italy, etc."

Venezuela Plans To Order Eight 85,000-Dwt Tankers For Export Oil Traffic

Venezuela has announced plans to order eight 85,000-dwt tankers for export oil traffic. The ships will

be of a design optimized for the Maracaibo trade.

Of the nine bidders for the contract, only one is a European shipbuilder. The Far Eastern contenders include four Japanese and three South Korean yards, together with China Shipbuilding Corporation of Taiwan.

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Toledo Shipyard Extends Main Drydock By 150 Feet In \$2.7 Million Contract

Following action taken by the board of directors of the Toledo-Lucas County Port Authority, Toledo, Ohio, Gary L. Failor, president, announced that a local construction company will extend the main drydock at The Toledo Shipyard by 150 feet.

The Port Authority, which has owned the shipyard since 1985, awarded a \$2,678,000 contract to Rudolph/Libbe, Inc., Walbridge, Ohio, for the drydock extension. Work will begin immediately and is expected to be completed by December.

Mr. Failor said that the longer drydock will accommodate vessels up to 800 feet in length, increasing the yard's capacity for vessel repair work from approximately 44 U.S. and Canadian ships to 105 now operating on the Great Lakes.

"Extending the drydock will result in 100 more full-time jobs at The Toledo Shipyard and up to five additional vessel dockings per year, which equates to \$1.5 million in business," Mr. Failor said.

The Port Authority also awarded a \$40,000 contract to the Toledo Caisson Corporation for the erection and assembly of a replacement gantry crane at The Toledo Shipyard.

For free literature detailing the facilities and capabilities of The Toledo Shipyard,

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Capt. Paul G. Gaffney II Assumes Command Of NRL

Capt. Paul G. Gaffney II, USN, the former Assistant Chief of Naval Research (ACNR) at the Office of the Chief of Naval Research (OCNR), became the 30th naval officer to head the Naval Research Laboratory (NRL) at a change-of-command ceremony held recently at NRL.

Captain Gaffney began his military career as the operations officer aboard the USS Whippoorwill in Sasebo, Japan, from 1969 to 1971. In 1971, he began a series of oceanographic assignments, beginning with duty as the Commander Naval Forces Vietnam Staff Oceanographer and Advisor to the Vietnamese Navy Combat Hydrographic Survey Team. He then served as the Oceanographic Services Officer for Fleet Weather Central in Rota, Spain. From 1975 to 1978, he served as the executive assistant and aide to the Oceanographer of the Navy in Washington, D.C.

Rail/Sea Link Crossing Soviet Union Opened By Sea-Land Service

A rail and sea link crossing the Soviet Union that could cut up to two weeks off the time it takes to move ocean freight from northern Asia to Europe is being opened by Sea-Land Service Inc. of Edison,

N.J.

A transit time of 23 days has been projected by Sea-Land executives in Rotterdam and Moscow. The link, typically called a landbridge, will also allow shippers moving cargo between Europe and the Far East to avoid the Persian Gulf.

The landbridge has been used by other companies, but delays inside the Soviet Union made it commercially unviable on a large scale.

However, Sea-Land claims to have overcome those difficulties.

Soviet block trains carrying the equivalent of 153 twenty-foot containers are scheduled to leave Vostochny and travel through Novosibirsk, Moscow and Minsk to a distribution center at Malaszewieze, Poland, where the containers will be transferred onto trucks and European railroads bound for major cities in the European community.

Cargo from Europe bound for Asia will be collected at Brest, on the Soviet side of the Polish border, and sent east to Vostochny.

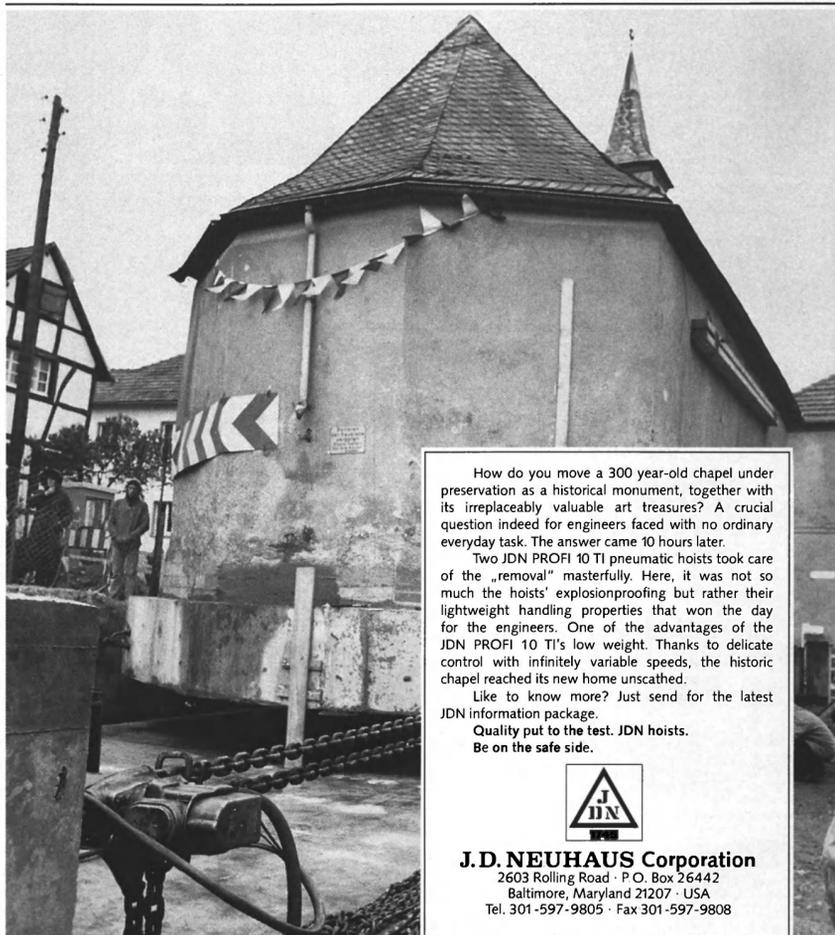
Sea-Land, which already has bookings for its first trains, plans to run its own ships from Japan to Vostochny, where it will supervise ship-train transfers and expedite distribution with its own trucks and an agreement with the European railways' cargo system.

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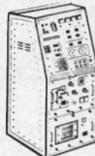
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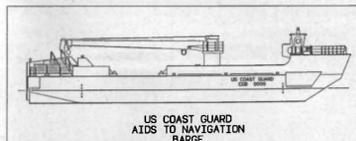
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Marinette Marine Receives \$5 Million From USCG To Build Second ATON Barge



US COAST GUARD AIDS TO NAVIGATION BARGE

Marinette Marine Corporation, Marinette, Wis., recently received a \$5 million contract change from the U.S. Coast Guard for the construction of a second Aids To Navigation (ATON) barge.

The second barge, which will be identical to the one currently under construction at the yard, will be used in conjunction with existing U.S. Coast Guard icebreaking tugs to deploy, maintain and recover floating navigation aids (buoys) on the Great Lakes.

The barges have a length of 120 feet, beam of 50 feet and incorporate a crane and winches for buoy handling. Each barge also contains berthing, galley and messing accommodations for 13 personnel.

For free literature detailing the building capabilities of Marinette Marine,

Circle 86 on Reader Service Card

South Korean Carrier Cho Yang To Order Two Containerships For New Tricon Venture

Two 2,780-TEU containerships are being ordered by South Korean carrier Cho Yang for the new round-the-world Tricon venture with German operators Senator Linie and Deutsche Seereederei Rostock (DSR).

The vessels, to be ordered in the first half of this year, will be ready for delivery in the first half of 1993.

Six ships were deployed by Cho Yang in the 24-vessel fleet when the Tricon service started on January 1 of this year. The three carriers intend to place between 33 and 35 vessels on the route by the end of 1993.

A spokesman for Cho Yang said he hoped the newbuildings would be ordered at Daewoo because the group had a good relationship with the yard which also had experience in building the 2,780-TEU-category vessel.

Micrologic ML-95 Remote Control Display Uses Independent Microprocessor

The new ML-95 Remote Control Display from Micrologic uses an independent microprocessor.

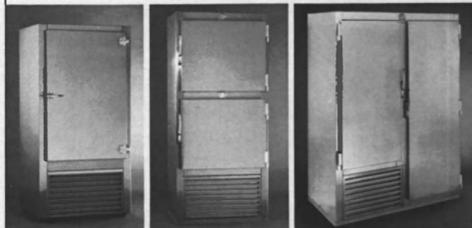
Now you can display data, switch waypoints and save waypoints from your remote location independently of the host Ioran or GPS, unlike passive repeaters. It is NMEA 0183 compatible, and will work with Micrologic's Explorer GPS, Explorer II, and ML-8000 II. Its compact, waterproof design and wide temperature display lets you mount it anywhere. It is backlit for nighttime use, and for larger vessels, up to four ML-95 Remote Control Displays can interact with the same host navigator, independently of each other or the host.

The ML-95 is made in the USA and comes with a one-year parts and labor warranty.

For more information and free literature on the new ML-95 Remote Control Display from Micrologic,

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The Shipbuilders of Spain

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ASNE DAY 91

'Naval Engineering In The Changing Defense Structure'

The American Society of Naval Engineers (ASNE) will celebrate 103 years as an individual member professional society this year with a technical program and exhibit show that emphasizes the role of the naval engineering community in the rapidly advancing and changing world of defense technology. The ASNE Day event, which actually consists of a two-day program, is appropriately titled, "Naval Engineering in the Changing Defense Structure."

Last year the program focused on "The Increasing Dimensions of Naval Engineering." According to an ASNE spokesman, ASNE Day '90 drew more than 2,500 attendees and 120 exhibits were on display featuring some of the latest equipment and services supplied

Commissioning ceremonies for the Newport News-built aircraft carrier USS Abraham Lincoln (CVN-72) at the Norfolk Naval Station last year.

to the naval sector. Twenty-four technical presentations were also given focusing on such topics as naval warfare, logistics, engineering education, the future of the Navy, and naval engineering research and experimentation.

This year's show is expected to be equally as successful. Held May 2-3, 1991 at the Omni Shoreham Hotel in Washington, D.C., ASNE Day 1991 will again feature 24 technical presentations on the full range of naval engineering related subjects, delivered by highly regarded members of the naval engineering community. In addition, over 120 companies that manufacture materials for the defense industry are expected to exhibit the most recent and sophisticated state-of-the-art equipment and systems currently available.

"A solid technical program has been assembled," said ASNE president Rear Adm. Lowell J. Hol-

loway, USN, "with subjects ranging from naval contingency to materials, from rapid prototyping to maintenance, as ASNE continues to be a true full spectrum society."

Speakers for the annual meeting include Adm. David E. Jeremiah, USN, Vice Chairman, Joint Chiefs of Staff; Gerald Cann, Assistant Secretary of the Navy for Research, Development and Acquisitions; and Dr. Robert M. White, president of the National Academy of Engineering, will deliver the Fourth Annual Isherwood Lecture. Secretary of Energy, Adm. James D. Watkins, USN (Ret.), has been invited to address the ASNE Presidents Club Luncheon.

The society will continue its tradition of presenting its prestigious awards in recognition for superior achievements in the naval engineering discipline; special volunteer-related service to the society; the best original technical paper pub-

lished in the *Naval Engineers Journal*, and its Gold Medal Award for accomplishments made over the past five years.

Registration materials were sent to ASNE's 8,000 members in mid-March, and all attendees, and especially government personnel, are encouraged to send in registrations as soon as possible. Purchase order numbers for government registrants are usually forwarded directly to ASNE the week prior to the meeting.

The exhibit hall will be open from 9 a.m. to 5 p.m. both days of the annual meeting, at no charge, but visitors who are not registered will be required to obtain a name badge at the ASNE registration office at the Omni Shoreham Hotel prior to touring the displays. For additional information, contact the ASNE offices at 1452 Duke Street, Alexandria, Va. 22314-3458, or call (703) 836-6727.

ASNE TECHNICAL PAPERS

Thursday, PM, May 2
2A Session

Moderator: Rear Adm. (Sel) John J. Donegan Jr., USN, and Capt. John H. Chenard, USN (Ret.), Assistant.

"Future Naval Contingency and Limited War Operations," by Dale K. Pace.

"Small Ships, Advanced Technology and Warfighting Performance," by David H. Skolnick and Alfred Skolnick.

"Artificial Neural Networks and Their Application to Weapons," by Willard P. Webster.

2B Session

Moderator: Paul A. Schneider and Terrence R. Applebee, Assistant.

"The U.S. Navy's New Coastal Minehunter (MHC). Design, Material and Construction Facilities," by Lt. Comdr. Richard D. Hepburn, USN, Giorgio Magliulo and Thomas Wright.

"Hydrodynamic Efficiency Improvements for U.S. Navy Ships," by Gregory P. Platzer, Donald N. McCallum, Gabor Karafiath and Allen R. Engle.

"Multimission Ship Design for an Alternative Fleet Concept," by Lt. Comdr. Michael Bosworth, USN, Aileen G. Kleiman and Steven C. Matz.

2C Session

Moderator: Rear Adm. Roger B. Horne Jr., USN, and Harry J. Skruich, Assistant.

"The U.S. Navy's Chlorofluorocarbon (CFC)/Halon Program," by Joel L. Krinsky and William Noel.

"Fouling Control of Navy Surface Ships—1990," by Chris P. Cologer.

"Reverse Osmosis for Surface Ship Desalination—An Overview," by Joseph F. Pizzino, Wayne L. Adamson and Wilbur L. Smith.

Friday, AM, May 3
3A Session

Moderator: Rear Adm. Thomas W. Evans, USN, and Frederick C. Marcell Jr., Assistant.

"Ship EMP Survivability Trials," by Michael E. Jump and William C. Emberson.

"Magnetohydrodynamic Submarine Propulsion System," by Daniel W. Swallow, Isaac Sadovnik, Judy S. Gibbs, Husam Gurul, Long V. Nguyen and Hugo van den Berg.

"Development of Lithium Rechargeable Battery for Underwater Vehicle Propulsion," by Patricia H. Smith, David L. Chua and Stanley D. James.

3B Session

Moderator: Alexander Malakhorr and Charles M. Atchison, Assistant.

"A Computational Study of HY and HSLA Steel Performance in a Bulkhead Test Panel Geometry," by Virginia DeGiorgi and Peter Matic.

"Current and Candidate Titanium Alloy Applications on U.S. Navy Surface Ships," by Ronald W. Schutz and Milton R. Scaturro.

"Structural Analysis Methods for Lightweight Metallic Corrugated Core Sandwich Panels Subjected to Blast Loads," by Christopher J. Wiernicki Franz Liem, Gregory D. Woods and Anthony Furio.

3C Session

Moderator: Capt. Ronald J. Marafioti, USCG, and Clayton W. Davis, Assistant.

"Role of Simulation in Rapid Prototyping for Concept Development," by J. Fred King and

Douglas E. Barton.
"Talon Hydraulic Helicopter-Shipboard Securing System," by Lt. Comdr. Joseph V. Grant.
"Polar Class Icebreaker Oceanographic Mission Upgrade," by Mark Tilyou, Neal Thayer and Richard P. Zimmermann.

Friday, PM
4A Session

Moderator: Thomas A. Clare and Richard Holden.

"Applying Vector Processing to Sonars for In-

creased Accuracy and an Expanded Operating Envelope," by David A. Whiney and Lt. Terry J. Benedict, USN.
"Concept for a Force Level Combat System," by M. Bridget Young.

4B Session

Moderator: Rear Adm. Robert E. Traister, USN, and Lt. Daniel K. Oliver, USCG, Assistant.

"Engineered Approach to Effective Maintenance Management," by Anthony M. Cieri and Mark M.

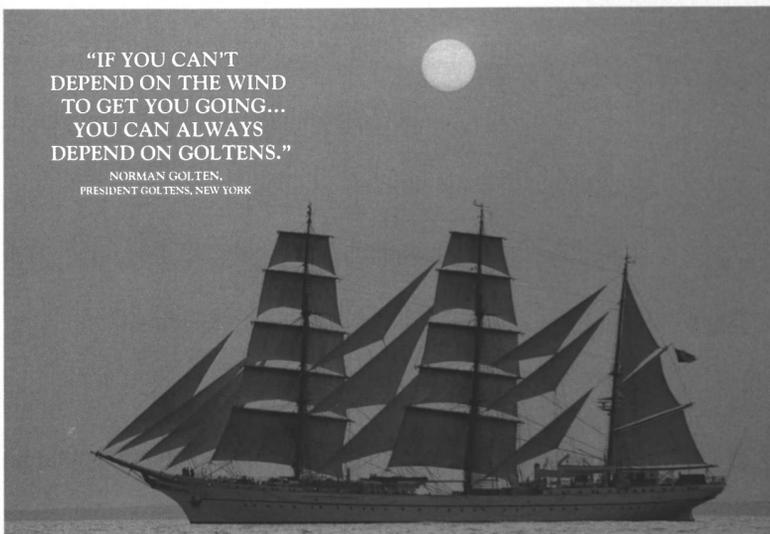
Elfont.
"An Affordable Approach for Quality-Assured Shipboard Maintenance Information," by Robert E. Knachel and William F. Magrogan.

4C Session

Moderator: Richard E. Metrey and William L. Thomas, Assistant.

"Tooling for Impeller Castings via CAD/CAM," by Erich A. Meyer.

"New Techniques in Weapon Firing Cutout Zone Design," by J. Everett F. George.



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(As of Press Time)

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American Bureau of Shipping
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Atlantic Research
Bath Iron Works
BMT International
CAE-Link/CAE Electronics

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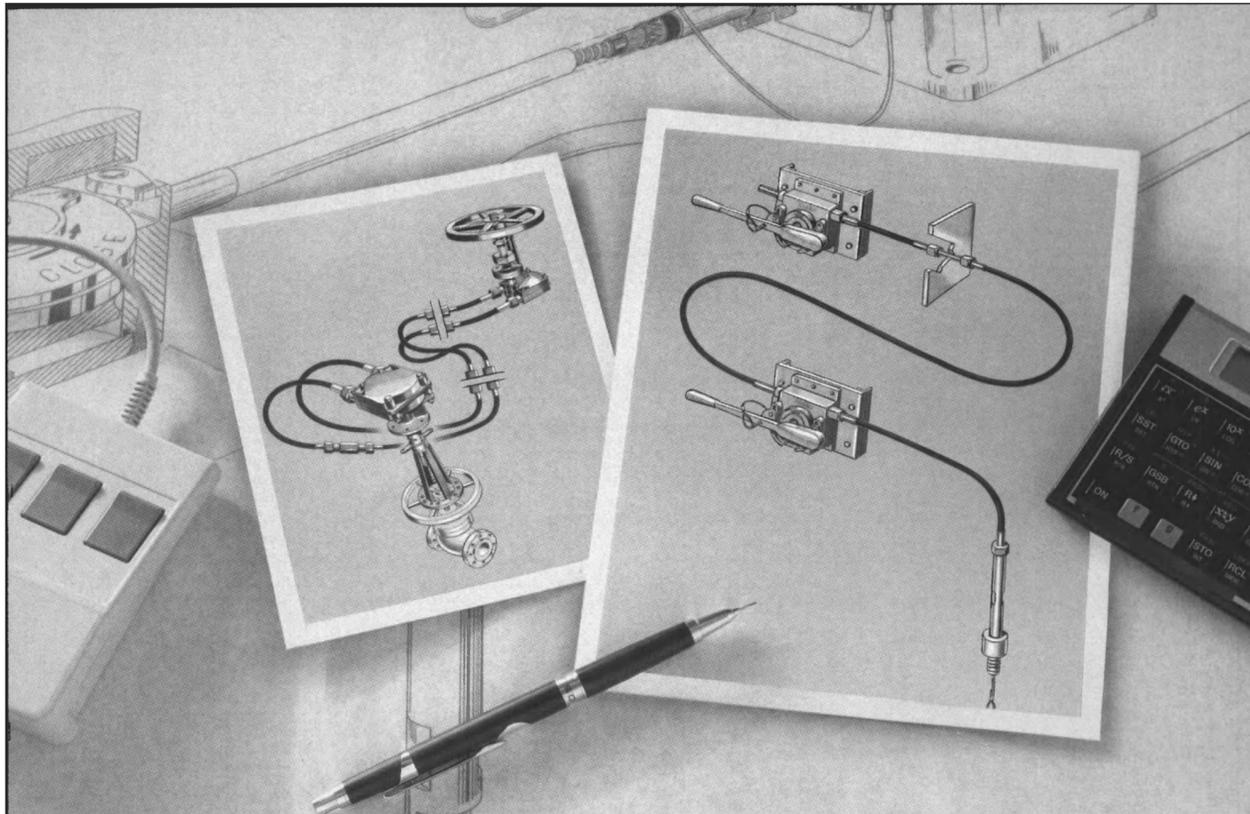
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Left: Remote Mechanical Valve Actuator. Right: Remote Trip Valve Actuator.

See us at ASNE
Booths 452, 453 & 454

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**ASNE 91
EXHIBITION GUIDE**

The following is a brief review of some of the major companies and organizations that will be displaying at the ASNE 91 exhibition. All exhibitors are not included due to space limitations. A short description of the products and services each firm will have on display is included along with the booths where they will be appearing and a Reader Service Number.

For further information on any of the company products or services in this guide, circle the appropriate Reader Service Number on the post-paid card bound in the back of this issue.

ABS

Circle 103 on Reader Service Card
The American Bureau of Shipping (ABS) classifies all types of vessels and marine structures. In addition, ABS offers certification of equipment and systems, marine survey and consultancy services and structural, mechanical and electrical analyses. ABS will exhibit at Booth 553.

AEROQUIP

Circle 104 on Reader Service Card
Aeroquip Corporation has over 40 years' experience designing and producing NAV-SEA-approved marine and MIL-Spec hose lines, fittings, couplings, adapters and other fluid power products. Aeroquip will exhibit at Booths 456 and 457.

ALMON JOHNSON

Circle 105 on Reader Service Card
Almon A. Johnson, Inc., Elizabeth, N.J., offers the marine industry automatic towing machines and mooring winches, capstans, anchor windlasses (both electric and hydraulic), conduit hose reels and custom deck equipment. Almon A. Johnson will have video operating displays at Booth 956.

APPLETON MARINE

Circle 106 on Reader Service Card
At Booth 157, Appleton Marine, Inc. will display its full line of deck machinery including cranes, mooring, constant tension, towing, and underway replenishment winches and anchor windlasses and capstans.

AQUA-CHEM

Circle 107 on Reader Service Card
Designers and manufacturers of naval and commercial desalting systems. The firm will exhibit at Booth 406. Aqua-Chem offers reverse-osmosis, vapor compression, flash type and plate or submerged tube varieties.

BATH IRON WORKS

Circle 108 on Reader Service Card
The lead shipyard for the design and construction of the Arleigh Burke Class (DDG-51) destroyer, Bath Iron Works, with yards in Bath and Portland, Maine, will exhibit at Booth 555.

CARLETON

Circle 109 on Reader Service Card
For over 30 years, Carleton's designs and applications of high pressure pneumatic and life support components have met the most stringent military standards and specifications. Carleton's products have proven themselves in some of the highest priority Department of Defense programs, involving the Navy's most technologically sophisticated submarines and surface vessels. Carleton Technologies will exhibit at Booth 412.

CATERPILLAR

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At Booths 125 and 126, Caterpillar will have static displays and show engine supporting display with the theme of "America's Technology Leader" in marine engines. Caterpillar offers diesel propulsion engines from 150 to 7,270 bhp, diesel generator sets from 50 to 5,720 ekw and worldwide product support.

CDI MARINE

Circle 111 on Reader Service Card
CDI Marine Company has provided engineering and design services to the marine industry since 1973. Supports both Navy and commercial shipbuilders from nationwide offices. In addition, CDI Marine also offers logistics capability and technical documentation services. They will exhibit at Booth 362.

CENTRICO

Circle 112 on Reader Service Card
Westfalia Separator, Centrico, Inc., offers Westfalia Oil-Purifying Centrifuges, available in both automatic self-cleaning and non-automatic designs. Products from the company will be displayed at Booth 602.

CINCINNATI GEAR

Circle 114 on Reader Service Card
The Cincinnati Gear Company, exhibiting at Booths 252 and 253, produces large Carburized, Hardened and Precision Ground (CHG) gears designed and manufactured to AGMA class 15 level. The firm reports that CHG gears in a large marine drive can result in a quieter gearbox that is 35 percent smaller and lighter than one of conventional through-hardened design. CGCO gears can be found in TAO-187, LCAC, AOE-6 Classes, as well as commercial high speed gas turbine applications such as the Kawasaki/Boeing jetfoil.

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gines for ship propulsion and power generation applications. Colt-Pielstick engines are featured on T-AO-187 Class Navy oilers and LSD Class ships. The company will exhibit at Booths 302, 303 and 304.

DAYTON T. BROWN

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The Engineering and Test Division of Dayton T. Brown, Inc., Bohemia, Long Island, N.Y., provides testing and engineering services to government and commercial organizations, primarily in the following markets: Department of Defense hardware, aerospace, transportation, communications, and energy. These services include simulation and recording of natural and induced environments (climatic, dynamic, and electromagnetic) on units under test, component and system evaluation, reengineering/product improvement, development of specifications and standards, design and fabrication of prototypes, design and fabrication of specialized test equipment, field data acquisition, reliability and maintainability analysis and predictions, and failure analysis. The technical disciplines applied in these services include: electronic, electromechanical, mechanical, hydraulics, and fluid power. The company will exhibit at Booth 657.

DEUTSCH METAL

Circle 117 on Reader Service Card
Deutsch Metal Components will display pyplok®, an innovative, cost-reducing method for joining shipboard piping at Booths 605 and 606.

DIVERSIFIED TECHNOLOGIES

Circle 118 on Reader Service Card
At Booth 956, Diversified Technologies will display photos and videos of its naval architecture, marine engineering, salvage engineering, mooring design, drydock certification/calculations, computer-aided design/engineering, computer aided logistics support, technical documentation, specialty equipment design and project management services.

L.C. DOANE

Circle 119 on Reader Service Card
The L.C. Doane Co. of Essex, Conn., located at Booth 802, offers U.S. Navy shipboard lighting I/A/W Mil-F-16377, and shipboard lighting I/A/W VL595 for commercial and MSC ships manufacture and design. The firm will display lighting from both these categories.

DRESSER PUMP

Circle 120 on Reader Service Card
Dresser Pump Division, Dresser Industries, will exhibit at Booths 159 and 160. The company will display its magnetic drive pump, model DM-1000. This is a seal-less pump that addresses the industry's concerns of preventing corrosion, toxic or carcinogenic leakage into the atmosphere. The company will also exhibit its new end suction general service pump, model D-1090.

ENVIROVAC

Circle 121 on Reader Service Card
At Booths 358-359, Envirovac Inc. produces the Evac vacuum sewage transport systems for the marine industry. Maximum flushing water consumption is three pints per flush; small diameter piping can be used with non-sloping lines; vertical lift capabilities. The Envirovac Orca and Orca IIA sewage treatment systems (Type II Physical/Chemical process) are compact, lightweight, easy to install and maintain, and are microprocessor controlled and USCG certified and IMO approved.

ENVISIONS

Circle 122 on Reader Service Card
ENVISIONS offers design engineering, drafting, logistics, automated data processing and in-service engineering to the Navy, Coast Guard and other government agencies. The firm will display info on its current services and customers at Booth 410.

FALK

Circle 123 on Reader Service Card
Falk Corporation offers marine propulsion

gears, power take-off drives, high-quality steel castings, continuous slip clutches and gear monitoring equipment. Falk will exhibit at Booth 959.

GE ALCO POWER

Circle 124 on Reader Service Card
GE Alco Power will display at Booth 654 its Alco 251 model diesel engine, rated at 600-4,800 hp, for main propulsion and ships service generators. Engine components will be on display.

GE MARINE & INDUSTRIAL ENGINES

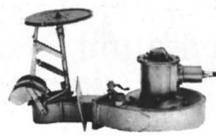
Circle 125 on Reader Service Card
Located at Booths 205-207, 255-257, and 305-307, GE Marine & Industrial Engines offers aeroderivative gas turbines, 6,000-60,000 shp, for marine propulsion for military ships, cruise ships, fast ferries, megayachts, hydrofoils, etc. The company will display GE's LM2500, which has been used in naval propulsion on 305 ships, 37 ship classes and 24 navies worldwide. The com-

pany will also display the LM3000 Inter-cooled Regenerative Gas Turbine team and the entire family of marine gas turbines from GE M&I.

GIBBS & COX

Circle 126 on Reader Service Card
A leading naval architecture and marine engineer for the Navy, Gibbs & Cox has prepared detail design drawings of over 40

(continued)



'Zero speed' steering and infinitely variable manoeuvrability.

Twin duct reverse flow to give up to 55% of forward thrust going astern (single deflector reverse is approximately 25%).

Raking intake screen for trouble-free operation in fouled waters.

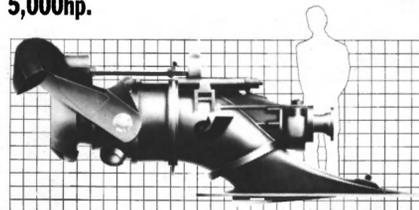
Integrated package design includes mounting base, intake, steering and 'follow-up' reverse system in one module.

One piece cast stainless steel impellers.

Computer program for individual performance analysis.

Propulsion efficiency to rival the best propeller systems.

Capability to match engine powers up to 5,000hp.



Since we first designed the marine jet propulsion unit in the 1950's we've had to change a few things.

Simply pioneering marine jet propulsion, hasn't meant we've stopped continually improving it. The Hamilton Jet unit is the most copied marine propulsion unit in the world. And at Hamilton's, we believe that the sincerest form of flattery is imitation. But there is no substitute for ongoing research and development.

While other waterjet manufacturers continue to look for inspiration, our design engineers have been incorporating features that are special to Hamilton Jet. Like the twin duct reverse deflector for 'zero speed' steering and instant braking, moulded casings for greater strength, and other refinements for utmost efficiency. All this means that we're not content just being pioneers. We're determined to provide marine architects, boat builders, operators and captains of vessels throughout the world with the best marine propulsion units available.

Isn't that what change is all about?



Highly Specified. Hamilton Jet

Manufactured in New Zealand by CWF Hamilton and Co Ltd, P.O. Box 709, Christchurch, New Zealand, Ph: +64-3-3484-179, Fax: +64-3-3486-969.
Worldwide Distributors — Italy, Spain, UK, USA, Canada, India, France, Germany, Holland, Australia, Finland, Hong Kong, Indonesia, Korea, Norway, Singapore, Sweden, Taiwan, Japan, Malaysia, Thailand, Denmark, Philippines. CWF0029

Circle 224 on Reader Service Card

ASNE Day Preview

(continued)

classes of surface ships in its more than 60-year history. The company will display at Booths 556 and 557.

INGALLS SHIPBUILDING

Circle 127 on Reader Service Card
Ingalls Shipbuilding, division of Litton Industries, offers shipbuilding, repair and overhaul of Navy surface combatants, as

well as marine design and engineering services. Ingalls' exhibit will promote its more than 50 years of shipbuilding and naval engineering expertise. In addition to U.S. Naval surface ships, Ingalls has expanded its capabilities to support the needs of foreign coastal navies with design and construction of the SA'AR 5 Corvette Class. The firm will display its capabilities at Booths 650-651 and 711.

IMO DELAVAL

Circle 128 on Reader Service Card
Located at Booths 100-102 and 150-152. Imo Delaval Inc., has been a leading supplier

of systems and components to the U.S. Navy for more than 50 years. Products offered by the company and its divisions include level and flow instrumentation, screw pumps for fuel, hydraulic and transfer service, electronic and mechanical controls, propulsion turbines and gears, surface condensers for marine applications, original equipment parts, repair and service.

ITW PHILADELPHIA RESINS

Circle 129 on Reader Service Card
At Booth 511, ITW Philadelphia Resins offers pourable chocking compounds, cor-

rosion-resistant coatings, epoxy remetalizing and repair systems, Mil-Spec coatings and adhesives. ITW Philadelphia Resins will display nonskid deck coatings and Chock Fast Orange pourable chocking system.

JERED BROWN BROTHERS

Circle 130 on Reader Service Card
Jered Brown Brothers offers a full line of motion control and material-handling equipment. Jered Brown Bros. equipment has been utilized on such U.S. Navy ships as FFG, T-AO, LHD, LSD, MCM, CVN and CG classes. The company will exhibit at Booths 404-405.

JJH

Circle 131 on Reader Service Card
JJH, Inc., a naval architecture and marine engineering firm, will exhibit at Booth 311.

KEYSTONE VALVE

Circle 132 on Reader Service Card
Valve manufacturer Keystone Valve will have materials on display at Booth 661.

LAPEYRE STAIR

Circle 133 on Reader Service Card
At Booth 600, Lapeyre Stair, Inc., New Orleans, La., will display its alternating tread stair.

LONSEAL

Circle 134 on Reader Service Card
Lonseal, Inc., Carson, Calif., offers "the complete sheet vinyl marine decking," Lonmat UV. Lonmat UV is a heavy-duty sheet vinyl material available with a new ultraviolet-cured, high-gloss finish. The firm will display at Booth 103.

MAGNETEK DEFENSE SYSTEMS

Circle 135 on Reader Service Card
MagneTek Defense Systems, Anaheim, Calif., will display solid state bus transfer, DC drives, pulse generators, line power conditioners, distribution system protection, converters and inverters at Booths 652 and 653.

MAROTTA SCIENTIFIC

Circle 136 on Reader Service Card
Marotta Scientific Controls, Inc., Montville, N.J., offers conformance, support and service in specialty valves and systems for precise fluid control. The company will be exhibiting at Booths 458 and 459.

JOHN J. MCMULLEN

Circle 137 on Reader Service Card
John J. McMullen works closely with the U.S. Navy, private shipowners, shipyards, combat system companies, energy companies, and international clients to provide a total engineering and design capability, extending from initial requirements analysis and concept design to final detail design, validation and verification, testing, fleet support and field support. Pictures and videotapes of past naval designs will be on hand at Booth 908.

MTU

Circle 138 on Reader Service Card
MTU of North America, at Booths 705 and 706, will display information on its marine diesel engines, which range in power from 600 to 10,000 hp for ship propulsion and auxiliary applications aboard frigates, corvettes, submarines, patrol boats, etc.

NEWPORT NEWS SHIPBUILDING

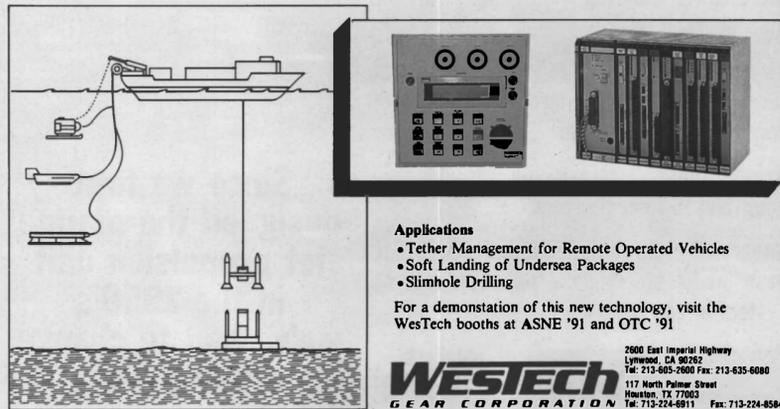
Newport News Shipbuilding & Drydock Co., Newport News, Va., is a leading U.S. shipbuilder and ship-repairer. The yard is currently constructing Nimitz CVN-68 Class aircraft carriers and SSN-688 Class attack submarines for the U.S. Navy. The company will display its capabilities at Booths 450-451 and 500-501.

NMP

Circle 139 on Reader Service Card
NMP Corporation, Tulsa, Okla., will exhibit shock hardened electrical switchgear at Booths 702 and 703.

New Active Heave Compensation Systems

With over 20 years of experience in providing heave compensation devices, WesTech Gear Corporation introduces its **NEW! Computerized Motion Compensation Technology.**



Applications

- Tether Management for Remote Operated Vehicles
- Soft Landing of Undersea Packages
- Slimhole Drilling

For a demonstration of this new technology, visit the WesTech booths at ASNE '91 and OTC '91

WESTECH GEAR CORPORATION

2600 East Imperial Highway
Lynwood, CA 90262
Tel: 213-605-2600 Fax: 213-635-6080

117 North Palmer Street
Houston, TX 77063
Tel: 713-224-6911 Fax: 713-224-8584

Circle 294 on Reader Service Card

Do you have a TRASH problem? Let us help you with THE ULTIMATE HIGH-PERFORMANCE TRASH COMPACTOR FOR SHIPBOARD OR DOCKSIDE DISPOSAL



Available in three sizes, highly efficient and simple to operate, the ICI trash compaction system is ideal for shipboard or dockside solid waste disposal. With a compaction ratio of up to 20:1, stainless steel compaction chamber and stainless steel outer cabinet, it's the "state-of-the-art" solid waste disposal system for marine use.

Don't just take our word for it. Ask the U.S. Navy, Cunard Lines, Chandris Cruises, the Captain of Delta Queen, the crew of Pacific Princess, Conoco, Mobil, Shell, Texaco or any of our highly-satisfied customers.

And remember the ICI compaction system is also a baler and will bale cardboard.



REGIONAL OFFICES:

Peter Gerard Assoc.
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Irvington, NY 10533
914-691-6811
Peter Cecchini

ICI of Louisiana
837 Oak Hollow Dr.
Hammond, LA 70401
504-345-3685
Tommy Schwartzmann

Marine Venture Ltd.
194 Kings Road
Reading RG1 4NH England
(0734) 503707
Ray Holubowicz

**INTERNATIONAL
COMPACTOR
CORPORATED**

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See us at OTC
Booth #2690

CORPORATE HEADQUARTERS:

P. O. Box 5918
Hilton Head Island, S.C. 29938
Telephone: 803-686-5503
FAX 803-686-4224

14719 Carolcrest
Houston, Texas 77079
Telephone: 713-589-0335
FAX 713-497-4620

Circle 334 on Reader Service Card



OMNITHRUSTER

Circle 140 on Reader Service Card
World leaders in high velocity waterjet propulsion and maneuvering systems, Omnithruster supplies the U.S. Navy, Japanese Defense Forces, Soviet Sea Exploration Ministry, Canadian Coast Guard and many major oil and shipping companies, and commercial users. Systems range from 125 to 2,000 hp and up. Both bowthrusters and propulsion with 360 degree thrust capabilities are offered. Simple and computerized control systems are available. Omnithruster will display at **Booth 163**.

PAXMAN DIESEL

Circle 141 on Reader Service Card
Paxman Diesels Limited will exhibit its diesel engines, ranging in power from 892 to 2,112 kw in 12- and 16-cylinder models, at **Booths 502 and 503**.

PORT OF PORTLAND

Circle 142 on Reader Service Card
Located at the Port of Portland (Oregon), which is celebrating its 100th anniversary, is the Portland Ship Repair Yard (PSRY), one of the largest, most modern facilities on the West Coast. The yard has the capabilities for both naval and commercial work. PSRY will offer information at **Booths 709 and 710**.

PRC

Circle 143 on Reader Service Card
Products, Research & Chemical Corporation (PRC) is a leading manufacturer of coatings, sealants and adhesives for the marine industry. The firm will display at **Booth 613**.

ROLLS-ROYCE

Circle 144 on Reader Service Card
Rolls-Royce will display information on its marine diesel engines for Navy and commercial applications at **Booths 508-509 and 558-559**.

M. ROSENBLATT

Circle 145 on Reader Service Card
M. Rosenblatt & Son, Inc., is a leading naval architecture and marine engineering firm. The company will display at **Booths 354 and 355**.

SCHOTTEL

Circle 78 on Reader Service Card
Schottel of America supplies the marine market with 360 degree controllable propulsion systems and maneuvering aids. The company will display at **Booth 612**.

SEACOAST ELECTRIC

Circle 146 on Reader Service Card
Will display at **Booths 462-463 and 512-513**. Seacoast Electric offers military wire, cable and electrical supplies. Some of its products include shipboard cable, terminal and stuffing boxes, circuit breakers and motor controllers.

SEACOR

Circle 147 on Reader Service Card
Systems Engineering Associates Corporation (SEACOR), on display at **Booth 407**, offers management, training, technical support, ILS and marine engineering services.

SEAWARD INTERNATIONAL

Circle 148 on Reader Service Card
Seaward International, Inc., Clearbrook, Va., will exhibit at **Booth 2**. The firm offers elastomer materials development for corrosion, abrasion and acoustic applications. Photos and samples will be on hand.

GEORGE G. SHARP

Circle 149 on Reader Service Card
George G. Sharp, Inc., with offices in New York, Washington, D.C., Virginia Beach, Va., and Philadelphia, Pa., offers systems analysis, naval architecture and marine engineering services. The firm will display at **Booth 254**.

SOLAR TURBINES

Circle 150 on Reader Service Card
Solar Turbines Inc., a subsidiary of Cater-

pillar, Inc., supplies high-efficiency gas turbine generator sets and propulsion units. The company has been working with the U.S. Navy for over 50 years. Solar Turbines will exhibit at **Booths 658-659 and 143**.

SOLIDUR PLASTICS

Circle 151 on Reader Service Card
Solidur Plastics Co., a leader in the design and fabrication of Ultra-High Molecular Weight Polyethylene, will exhibit a variety of dock fendering and marine trade components at **Booth 3**. Solidur will highlight its

2090 Fender Pads, which are chemically inert, abrasion resistant and unaffected by marine organisms.

SPD TECHNOLOGIES

Circle 152 on Reader Service Card
SPD Technologies, exhibiting at **Booths 250-251 and 300-301**, is one of the largest producers of military circuit breakers, and a prominent supplier of other electronic controls for electrical systems protection in the U.S. and abroad.

QUALITY

COMMITMENT

Position
1.000
Light Control
Set Home
Go Home
Autofoc
Zero S
Roncl

CROSSHAIR OVER TOP-AN... CORNER

Quality and commitment are the cornerstones of SPD Technologies' long and proud history serving the U.S. Navy. In product design and engineering by dedicated professionals with long experience in meeting military standards. Meticulous inspection and testing of all parts and finished products. Precision fabrication and assembly. And service you can count on. Not some of the time, but all of the time.

In circuit breakers and switchgear from SPD. Ship control and interior communications systems from Henschel. Or overhaul and repair services from PacOrd. We are totally committed to serving the Navy's exacting needs for quality under the most demanding conditions.

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215/677-4900

Henschel
9 Hoyt Dr.
Newburyport, MA 01950
508/462-2400

PacOrd
9455 Ridgehaven Ct.
San Diego, CA 92123
619/576-1010

Circle 253 on Reader Service Card

**Western Atlas Orders
Fourth Survey Ship
For \$40 Million**

Western Atlas International subsidiary of Litton Co., Houston, Texas, reported that it has ordered a fourth seismic survey ship from a Norwegian shipyard for \$40 million.

Last year, Western Atlas contracted with Ulstein Hatloe A/S of Ulsteinvik, Norway, to build three of the ships for \$90 million. Western Atlas's survey fleet will be boosted to 34 ships with the new vessel.

The survey ships search for ocean oil deposits with 20,000-foot-long hydrophone cables they tow behind them. Because they stay at sea for months at a time, the new vessels will have crews of between 40 and 60 people who will be regularly rotated.

**PMSA Study Shows Impact
Of Maritime Industry
On 3 West Coast States**

A recent study done by SRI International of Menlo Park, Calif., for the Pacific Merchant Shipping Association (PMSA) revealed the maritime industry's economic impact on three West Coast states.

Maritime and related industries in California generate \$14.4 billion annually, \$4 billion in northern California and \$10.4 billion in southern California, the study found.

International trade in California increased 70 percent to \$14.8 billion in 1989 from \$8.7 billion in 1984. Total cargo volume increased to 175 million revenue tons in 1989 from 135 million in 1984.

Maritime-related jobs in the state in 1989 totaled 194,000, compared with 125,000 in 1984.

The state of Washington, the study said, gets \$6.1 billion annually from maritime and related industries. International trade was up 72 percent at \$6.2 billion in 1989 from \$3.6 billion in 1984. Total cargo for the period rose to 88 million revenue tons in 1989 from 70 million revenue tons in 1984. Maritime-related jobs in the state totaled 87,000 in 1989, compared with 59,000 in 1984.

In Oregon, maritime industries generate \$1.4 billion annually, the study showed. International trade rose 27 percent to \$1.4 billion in 1989 from \$1.1 billion in 1984 with total cargo volume increasing to 22 million revenue tons in 1989 from 20 million in 1984. Total jobs provided were 22,000 in 1989, up from 16,000 in 1984.

**General Dynamics
Announces Two
Key Appointments**

General Dynamics recently announced two key appointments at its corporate office in St. Louis, Mo.

James E. Turner Jr. has been named executive vice president-ma-

rine, land systems and services, and **Michael C. Keel** has been appointed executive vice president-missiles and electronics. Both will report to **James R. Mellor**, president and chief operating officer.

Mr. Turner will oversee operations at Electric Boat Division, Land Systems Division, General Dynamics Services Company, American Overseas Marine Corporation and the Undersea Warfare Center. His previous position was

corporate vice president and general manager of Electric Boat in Groton, Conn. He will continue as that division's general manager until a successor is named.

Mr. Turner joined General Dynamics in 1988 as corporate vice president and general manager of Electric Boat after 25 years with Newport News Shipbuilding Company of Tenneco Corp., and six years with Westinghouse Corp. His last position at Newport News was

executive vice president of operations.

Mr. Keel will have corporate responsibility for the company's missiles and electronics operations. He joined the Pomona Division in 1963 as an associate engineer, advancing through a series of engineering and management positions to corporate vice president and general manager of Air Defense Systems Division in 1990. He replaces **Ralph E. Hawes**, who recently retired.

Out here,



business depends
on knowing
the lay of the land.

AT&T High Seas Radiotelephone Service is the shortest distance from out here to back there. And that means it can help you take care of business better.

It's easy to check in from ship to shore. The *AT&T High Seas* operator can connect you to any telephone in the world. Quickly, reliably, economically.

And to reach a ship at sea to tell them the lay of the land, simply dial 1 800 SEA CALL.

*Use this number to book a call. The call itself is not free of charge.



**New Drydock Increases
Repair Capabilities
At Ryan Marine**

Ryan Marine Inc., Pearlington, Miss., recently announced that their newly constructed floating drydock is now in full operation at their 40-acre facility in the Port Bienville Industrial Park near Pearlington.

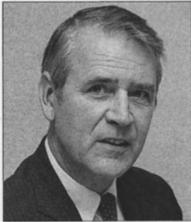
The new drydock measures 120 feet in length and can handle vessels weighing up to 900 tons.

"The new drydock, coupled with our 100-ton on-land Syncrolift system, now gives us the capability to facilitate repair work on as many as 14 vessels at any given time," **Janice R. Crespo**, executive vice president of Ryan Marine, said.

For more information on services offered by Ryan Marine,

Circle 44 on Reader Service Card

**Inventory Locator Names
Jim Bross Sales Director**



Jim Bross

Jim Bross has been promoted to director of sales for Inventory Locator Service, Inc. (ILS), it was recently announced by ILS president **Fred Meyer**. Mr. **Bross** will be sales director for the aviation, marine, power and telecommunications data base services. Mr. **Bross** was the manager of marine and aviation industry marketing for ILS. Prior to joining ILS in 1990, Mr. **Bross** was the general manager and a partner with American Classics, Inc. in Memphis. He has held management positions with Falcon Jet Corporation, AAR Corp., and Federal Express.

Inventory Locator Service, Inc., a subsidiary of Ryder System, Inc., provides data base services for the aviation, marine, power, and telecommunications industries. ILS data bases provide information on over 15 million line items of parts and equipment located in the inventories of suppliers worldwide. ILS clients can access the information via a personal computer with modem to find the location and condition of those items. The ILS Data Base is accessed more than 14,000 times daily.

**Hatch & Kirk Defco
Division Opens
In Houston, Texas**

A diesel engine sales and rebuilding division opened recently in the

Houston, Texas facility of Hatch & Kirk, Inc., the Seattle-based parts manufacturer.

Hatch & Kirk president **Roger Van Hoozer** announced the recent acquisition of the assets of Defco, a leading rebuilder of EMD engines located in Houston. The new division will take up a large portion of the Hatch & Kirk 230,000-square-foot facility with shops that have been designed for production capability of multiple medium-speed en-

gine rebuilds and dyno tests per month.

Mr. **Van Hoozer** stated: "As a manufacturer of Cleveland Diesel and Nordberg engine product lines, H & K needed the engine rebuilding operation to better serve the existing customer base. The acquisition of Defco and the volume of EMD rebuilds will allow the company to install the latest in production fixtures and equipment while utilizing economies of scale for competitive

pricing."

"Essentially, we will be adding trained technicians to the Defco staff, giving the Hatch & Kirk Defco Division quality rebuilding capability for Alco, Cleveland Diesel, EMD, Fairbanks-Morse, and Nordberg engines."

For further information and free literature on the new Hatch & Kirk Defco Division,

Circle 52 on Reader Service Card

A NEW CONCEPT IN GPS. CHOICE.

Innovative Tug/Barge Training Begins At Maritrans GP

Maritrans GP, Inc., the managing general partner of Maritrans Operating Partners L.P., has expanded its industry-leading training initiative to include a new training program for its 140 tug captains and mates. Developed jointly by Mari-

trans and MarineSafety International, the training combines an aviation industry approach to safety awareness with tug/barge simulator exercises.

MarineSafety International is a professional training organization and operator of the Computer Aided Operations Research Facility (CAORF) at the U.S. Merchant Marine Academy, Kings Point, N.Y. Maritrans Operating Partners L.P., headquartered in Philadelphia, Pa.,

is one of the leading independent marine transporter of petroleum products in the U.S.

The objective of the training is to help prepare the tugboat operators to avoid groundings, collisions or other incidents which might result in injuries or oil spills. Application of Maritrans' bridge procedures, passage plans, personnel responsibilities and communications are stressed.

MarineSafety will conduct 15

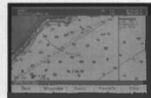
carefully structured courses in 1991 for eight Maritrans deck officers each. The five-day course consists of five seminars which include classroom instruction, role playing, simulator exercises and debriefings. The seminars are focused on the underlying causes of human error: loss of situational awareness, lack of adequate passage planning, failure to recognize developing error chains, poor communications and failure to follow procedures.

MARINER'S GUIDE TO GPS

No question about it: GPS lets you fix your position more precisely than any other technology.

Unfortunately, the way most GPS systems fit your needs has been considerably less precise. That's because most companies only give you one model to choose from.

But at Trimble, we've always thought your navigation system should fit your bridge, your work and your lifestyle. That's why we offer GPS in eight very different systems. Here's how to decide which one's right for you:



Charting If you want the ultimate in high-tech navigation, our *NavGraphic II™* is the most sophisticated GPS receiver commercially available. Integrating CD-ROM, LORAN, GPS, and micro-computer technologies, it plots a moving image of your boat right on a real NOAA chart. It's the most direct navigation device ever developed.



Ease of Use If you don't need charting, but like the way graphics simplify navigation, the

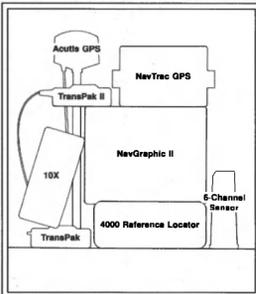
NavTrac™ GPS gives you a high-resolution screen in a smaller, more economical package. Its unique steering display shows you a perspective view of your boat's progress. And makes navigation as easy as driving down a road.

Portability If you've got more than one boat, or if your travels will take you over land or into the air, then you need a system you can carry. The *TransPak™* puts a complete three-channel GPS receiver and antenna into a package the size of a pair of binoculars. Splash-proof, mud-proof, shock-proof, this rugged little unit will go anywhere you do. And our new *TransPak II™* gives you the same portability with more waypoint storage and an I/O port.

Interfacing Both the *NavGraphic* and the *NavTrac* have extensive interfacing capability, but if you need a rugged system to act as the coordinating link of a fully-integrated nav station, the *10X™* is the perfect choice—especially in large installations where distributing control is important. The *10X* processing unit can handle two control heads, one for the nav station and one on deck.



GPS Sensors If you've already got a navigation system you're familiar with, you can upgrade to GPS in one quick step. Our *Acutis™* GPS is a complete 3-channel receiver and antenna integrated into a ruggedized module that's mounted just like an antenna. If your LORAN, chart-plotter, or radar accepts NMEA-0183, GPS is as easy as connecting a cable.



For even greater precision, we also offer a Six-Channel GPS Sensor that accepts differential corrections and gives you four I/O channels.

Differential For scientific and industrial applications, our *4000 Reference Locator™* is the industry-standard differential base station. It transmits differential corrections to roving receivers, letting them fix their positions to accuracies of a few meters.

So you can see, at Trimble we offer more than just high technology, we offer you a choice. Maybe that's why our systems are being used on everything from oil exploration ships to luxury yachts, from freighters to fishing boats.

If you'd like to know more, just call or write for our Complete Mariner's Guide to Trimble GPS. And we'll show you why Trimble GPS is the most precise navigation system—in more ways than one.

Circle 248 on Reader Service Card



TrimbleNavigation

The Leader in GPS Technology
For more information please call or write our Marine Division:
P.O. Box 3642, Sunnyvale, CA 94088-3642
1-800-TRIMBLE or 800-231-3001 in California
FAX 408-737-6637



China To Construct Over 50 New Docks To Cope With Cargo Increase

To cope with an anticipated 7 percent increase in cargo volume, more than 50 additional docks are to be built in China this year, according to a senior official.

The new facilities, to be spread all along the country's 11,000-mile coast, will add 28 million metric tons of cargo capacity, according to a report made available recently.

The five-year plan calls for China to create 180 new berths to add 170 million tons of capacity.

Qian Yongchang, minister of communications, said at a recent conference in Beijing that container capacity, now equivalent to 700,000 twenty-foot boxes or TEUs, would be developed. Expansion is also under discussion in a number of other places, including in the south near Hong Kong, China's largest and most modern port in the area, which handles a large percentage of China's trade.

An official in Tianjin, which is in the north and the biggest container-port, said plans are in hand to expand facilities there.

Electromatic Introduces New Pocket-Size Coating Thickness Gage

Electromatic Equipment Co., Inc. of Cedarhurst, N.Y., has introduced a new pocket-size, battery-powered *Check-Line®* DAC-88 coating thickness gage. Using a series of interchangeable, plug-in probes, it accurately measures the thickness of paint, plating, anodizing, oxides, films and clads on all metal surfaces. The DAC-88 is easy to use and sets up in minutes.

The DAC-88-S1 and S2 statistics models feature memory for up to 6,000 data points. Additionally, they automatically calculate and recall for display the number of data points, mean, standard deviation, maximum and minimum values. For a hardcopy, the data can be transferred to the check-line DAC-88P printer (or compatible). For more extensive statistical analysis, transfer the data to personal computers, data loggers, etc., via its RS-232C serial port.

For more information and free literature on the new coating thickness gage from Electromatic,

Circle 54 on Reader Service Card

War Showed Absolute Surge Requirement For More RO/ROs

The Pentagon's chief shipping officer, Adm. Francis Donovan, Commander of the Navy's Military Sealift Command, said in his first postwar analysis of the Persian Gulf military crisis that the U.S. merchant marine is deficient by some 20

to 25 roll-on/roll-off (RO/RO) cargo vessels.

He estimated that such additional ships would be necessary if the Pentagon were to forego reliance on foreign cargo vessels in emergencies of the same scope as Operation Desert Shield and Operation Desert Storm.

Roll-on/roll-off ships which are equipped with heavy ramps that allow tanks and other equipment to

be rolled on board without benefit of cargo handling equipment or highly skilled labor have been the key to the "tremendous success" of gulf transport operations, Admiral Donovan said. He added that for the future, it would be "far better to draw on an American merchant fleet" instead of relying on foreign ship charters for a significant portion of the supply effort.

Comments by the admiral echoed

Congressional testimony recently in which he said, "Desert Storm has pinpointed beyond a doubt the absolute surge requirement for more RO/ROs."

Freedman To Take Early Retirement At Wyle Lab; Holland To Become CFO

Theodore M. Freedman, executive vice president-finance and treasurer of Wyle Laboratories, has advised the company that he intends to take early retirement, effective January 31, 1992, the close of the company's upcoming fiscal year.

Mr. Freedman will continue as a member of Wyle's board of directors and will serve as a consultant to the company subsequent to his retirement.

It is anticipated that senior vice president R. Van Ness Holland Jr. will succeed him as chief financial officer.

McDermott To Build Gas Pipeline Across Long Island Sound

The Iroquois Gas Transmission System recently awarded a \$25 million contract to McDermott International Inc. of Morgan City, La., to build a 26.3-mile pipeline crossing the Long Island Sound. Construction of the Sound crossing is the first phase of the plans to build the 370-mile Iroquois natural gas pipeline through New York and Connecticut this year.

McDermott is expected to employ approximately 250 workers, more than half of whom may be hired from Connecticut, New York and New Jersey, to perform construction activities such as survey work, dredging and land pipeline operations.

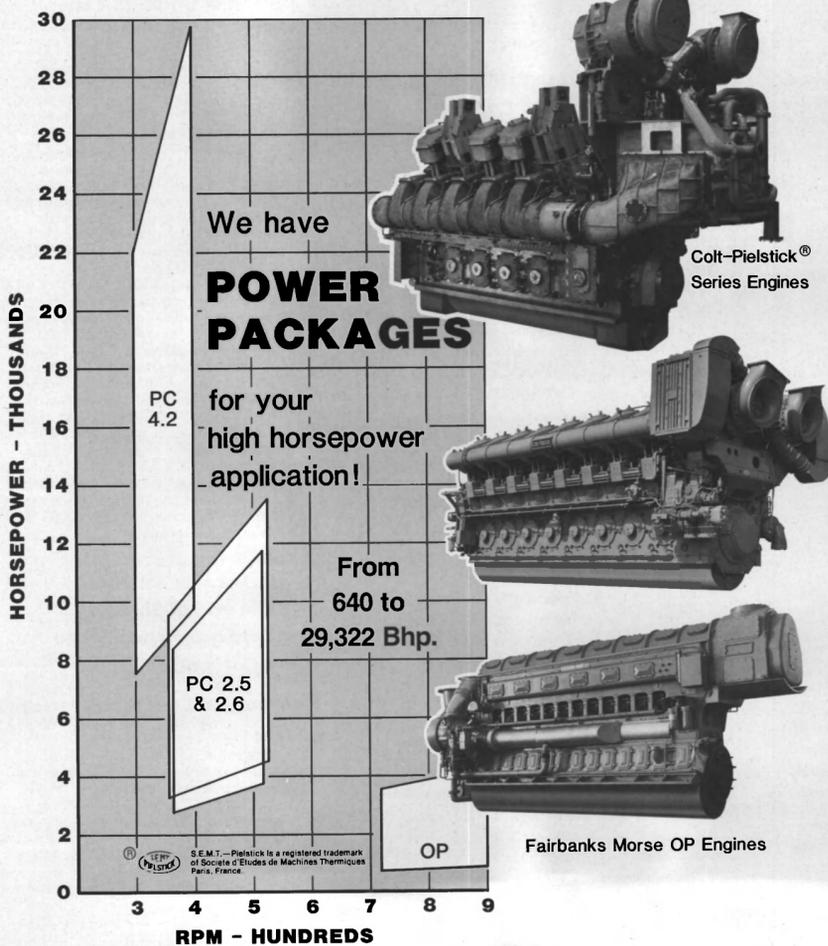
VSI Introduces New Approach To Coatings Removal On Ships

Vacuum Systems, Inc. (VSI) has pioneered a new methodology for thin film coating removal which introduces a means to deal with industrial hygiene and waste disposal problems. This method is particularly well suited to applications involving lead-based paints.

VSI, a service contractor in the water jetting field, has been in business for 14 years and operates a wide range of equipment including water jetting systems ranging from 5,000 psi up to 35,000 psi. The company has significant experience in conventional (or lower pressure) water blasting and is rapidly becoming quite experienced with UHP water jetting. At this time, the company's primary mission is the development and application of water jetting technologies for all facets of industrial field services.

For further information and free literature,

Circle 34 on Reader Service Card



Coltec Industries



Fairbanks Morse
Engine Division

Circle 29 on Reader Service Card

Sperry Marine Maintains Leading Position In Competitive Marine Electronics Market

Charlottesville, Va., is home to Sperry Marine Inc., a company which enjoys a world leadership position in an electronics market increasingly dominated by the Japanese.

Sperry Marine, which celebrated its 80th anniversary last year, traces its beginnings to the Sperry Gyroscope Company founded in Brooklyn, N.Y., by inventor Elmer A. Sperry. Mr. Sperry created the company to manufacture his newest invention, the gyrocompass, for the U.S. and British Navies just in time to meet the demands of World War I. Over the next 40 years, the company grew into the giant \$5 billion Sperry Corporation with business activities in computer technology, hydraulics, agricultural machinery and aerospace. The marine gyro-

scope business grew to include radar, Automatic Radar Plotting Aids (ARPA's), autopilots, speed logs, electronic navigation aids and ship fin stabilizers.

Following the takeover of Sperry Corporation, the parent of Sperry Marine, by Burroughs in 1987 and the ensuing formation of the two companies into UNISYS, Sperry Marine was purchased by Newport News Shipbuilding and Sperry Marine Inc. was formed.

To remain competitive in the marine market, Sperry had been forced to have a steadily increasing number of its products manufactured in Japan. Recently, however, the company decided to reverse this trend and bring its product manufacture back into the U.S. Sperry believes that an American manufacturer can



Sperry Marine's RASCAR is designed and built in the U.S.

no longer compete head to head in the manufacture of the basic "me-too" equipment. However, Sperry felt that by utilizing innovation and system engineering—talents in

which many American companies excel—it could compete with foreign manufacturers. Sperry Marine

(continued)

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ABS Americas is one of three new divisions (the other two are ABS Europe and ABS Pacific) that manage the activities of 159 local ABS offices serving marine and offshore industries throughout the world. Our newly reorganized structure brings top management even closer to ABS clients like you, making ABS more responsive to your needs and more sensitive to the local conditions where you operate.

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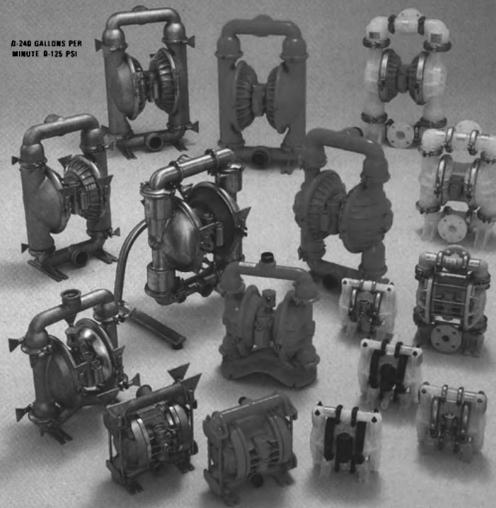
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55

Sperry

(continued)

believes new equipment has to have clear discriminators over its Far East competition and take advantage of their shortcomings in the fields of innovative software design and system engineering.

As a result of this strategy, Sperry Marine Inc. has weathered the

storm and prospered and is now the only manufacturer of commercial deep-sea marine radar in the U.S.

In 1987 Sperry Marine spearheaded a joint venture with its Japanese affiliates. Sperry developed and built a new radar/ARPA while the antenna and transceiver was built in Japan. The result of this joint venture was the RASCAR (Rasterscan Collision Avoidance Radar). RASCAR uses a "touch-

screen" overlaid on the main display as the man/machine interface instead of knobs or switches. Controls are displayed on the screen either permanently or in a series of menu pages and are operated by touching the screen. This concept takes advantage of the natural instinct to point and the link between action and reaction is simpler and more natural.

Sperry Marine's RASCAR was

awarded the "Good Design" award by the Japanese Ministry of Trade and Industry in 1988.

For a free color brochure on Sperry Marine's RASCAR or other navigation products,

Circle 58 on Reader Service Card

Coltec Industries Names Dashnaw Group President

Richard L. Dashnaw has been named a group president of Coltec Industries Inc.

Mr. Dashnaw retains his title as president of the Fairbanks Morse Engine Division in Beloit, Wis., and his responsibilities for the Fairbanks Morse Engine Accessories Operation in Roscoe, Ill., and MEP Industries in Houston, Texas. He will also be responsible for the Quincy Compressor Division in Quincy, Ill.

Mr. Dashnaw joined Coltec Industries as president of Fairbanks Morse Engine in 1987. Prior to then, he was vice president, operations, of the Flow Control Division of Rockwell International. Before moving to Flow Control, he spent more than 18 years in a number of management positions with General Electric Company in both engineering and operations.

Mr. Dashnaw was graduated in 1960 from Rochester Institute of Technology with a Bachelor of Science degree in mechanical engineering. He completed advanced educational programs in management and marketing while at General Electric and Rockwell International.

Marine Industries Modifies Refrigerated Freighter

Marine Industries Northwest Inc. of Tacoma, Wash., recently performed pilothouse relocation and foredeck addition to the Sally J, a refrigerated freighter owned by Western Pioneer of Seattle.

The Sally J. measures 175 feet long, with a 38-foot beam and 24-foot depth. The Alaskan freighter carries general cargo on deck and provides refrigerated cargo holds of over 62,000-cubic-foot capacity.

The existing pilothouse was removed from the 01 deckhouse forward and relocated up a few frames aft atop the 02 quarters deck. Original bridge outfit was gutted, the wheelhouse structure narrowed, and all new bridge interior was installed with upgraded navigation equipment.

A new foredeck was constructed leading forward from the former bridge 01 deck location to enclose the original foc'sle deck.

Marine Industries Northwest Inc. is a full-service shipyard serving the Pacific Northwest more than 15 years, specializing in the conversion/repair work of barges, tugs, and coastal freighters to ABS and USCG standards.

For free literature on the facilities and capabilities of Marine Industries Northwest,

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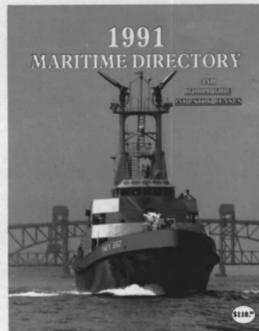
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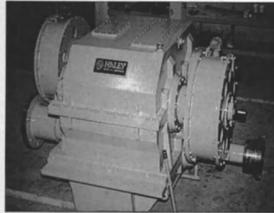
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**Haley Reduction Gear
To Be Fitted On
3,600-HP Tug**



The Haley RIHF 2828 reversing inline reduction gear unit recently sold by Marine Gears, Inc. for installation on the M/V San Pablo, a repowered ship docking and escort tug.

Marine Gears, Inc. recently announced the sale of a Haley reversing inline reduction gear unit, model RIHF 2828, to Bay & Delta Towing Co. of San Francisco, Calif., for the repowered ship-docking and escort tug M/V San Pablo.

The Haley gear, paired with an EMD 20-645 E diesel engine, rated for 3,600 hp at 900 rpm with a ratio of 4.25:1. The heavy duty steel fabricated case housing was stress relieved and all gears were induction hardened. Gear elements were hobbled and precision skived.

The unit was delivered to Union Bay Shipbuilding, in Seattle, Wash., for installation.

For free literature detailing the full line of gearing offered by Marine Gears,

Circle 84 on Reader Service Card

**Mitsui Plan
For VLCC Dock
Draws Criticism**

Japanese shipbuilder Mitsui Engineering & Shipbuilding recently drew criticism after it announced plans to build a new 1,000-meter dock for constructing Very Large Crude Carriers (VLCCs).

The \$740 million project was criticized by other Japanese builders because of the risk of repeat of the overcapacity experienced by the industry in the 1980s.

However, Mitsui defended the project saying that the dock would be used to build ships to replace the aging world tanker fleet.

**Archway Marine Lighting
Introduces New Hi-Tech
Searchlight Fixture Line**

Archway Marine Lighting, St. Louis, Mo., has introduced a new hi-tech searchlight fixture line suitable for towboats, oceangoing vessels, passenger vessels and other specialized workboats needing a very bright and fog-penetrating beam.

According to the manufacturer, the sanshin, solid-state, xenon searchlight design makes it easy to install, thus reducing installation expense; the solid-state electronics provides for much reduced maintenance

expense as there are fewer electronic parts to wear out, such as transformers, capacitors.

Also, the glass-reflector with metal back provides a superior optics operation over life of fixture as the reflector is easy to clean and will not bend out of shape; the cooling system provides an ideal environment for the xenon bulb, improving its performance and increasing its life; the optics system allows the

lamp to be installed and replaced with no tools, which will reduce service cost; the dip and the elevation of the fixture is accomplished without rack and pinion gear (which can be jammed with ice), thus making the sanshin an all-weather fixture; and the power supply features a variable amp control which allows the lamp candle power to be varied to need, thereby increasing the life of the lamp.

The line includes two wattages, the 1,000-watt and the 2,000-watt. Each wattage comes in cabin-control with auto-focus and full remote control.

Archway marine carries inventory on all fixture sizes and stocks all replacement parts.

For additional information and free literature from Archway,

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**Sound Ocean Systems,
SUTEC Awarded NavSea
MMUROV Contract**

Sound Ocean Systems, Inc. (SOSI) of Redmond, Wash., has been awarded a major contract from the Naval Sea Systems Command for the supply of Multi-Mission Underwater Remotely Operated Vehi-

cle (MMUROV) systems. SOSI is teamed with SUTEC (Scandinavian Underwater Technology) of Linköping, Sweden, to deliver two complete systems to meet the Navy's multiple requirements for Explosive Ordnance Disposal (EOD), Craft of Opportunity (COOP) and Maritime Defense Zone (MARDZ) programs. The subsea vehicle and controls are based on the SUTEC Sea Eagle

and Sea Owl family of systems. Dubbed the Sea Eagle Mk III, the vehicle is capable of exceeding four knots when fully deployed. It is actively stabilized in three axes and will be capable of carrying, deploying and activating a payload. The complete system includes a launch and retrieval system, tether control and storage, navigation sonar, acoustic tracking system, main

station and remote control consoles and system generator. Sound Ocean Systems will also provide training, integrated logistics, documentation and engineering services.

For more information and free literature from Sound Ocean Systems,

Circle 55 on Reader Service Card

**CSX/Sea-Land Logistics
Wins Contract To Haul
Ship Cargo For Kuwait**

A major contract to move cargo for the Government of Kuwait has been won by CSX/Sea-Land Logistics Inc.

An official of the Kuwait Emergency and Recovery Program in Washington, D.C., said the distribution subsidiary of CSX Corp., Richmond, Va., "will be shipping and doing logistics for us."

Observers said the business potential of the contract, which is believed to be exclusive, is huge.

Whether CSX Corp.'s container shipping subsidiary, Sea-Land Service Inc., has started carrying cargo for Kuwait is not known, but officials at other shipping lines said their companies have started moving materials to be used in rebuilding the war-damaged nation.

**Amprodux Introduces
New Model Level
Alarm/Control Unit**

Amprodux, manufacturer of a broad line of level instrumentation, offers an attractive, compact single-level alarm and control unit called Model 101.

The model 101 has a field-adjustable selector switch, for low or high-level alarm/control. It has a multi-turn-potentiometer sensitivity adjustment to determine exact tripping level, and a trip-point delay of approximately 1.5 second, to prevent accidental tripping due to splashing or turbulence. The relay has single-pole double-throw 5-ampere contacts, and LED to indicate the status.

This control unit can use any Amprodux RF capacitance-type probe, all of which are intrinsically safe for all hazardous areas, including Class I, Div. I. Probes are available for most applications, including corrosive, viscous, flammable, and explosive liquids, as well as granular solids.

The Model 101 can be used for high-level alarm/control to prevent overflow, or low level alarm/control to prevent runoff, pump from running dry, heater from burning out; to detect leaks of hydrocarbons, water, chemicals, etc. on floors, under computer floors, in tank vaults, or in the interstitial cavity of double-wall tanks; to detect oil-water interface in a sump or separator, water under fuel, or other liquid-liquid interface.

For further information on the Model 101 from Amprodux,

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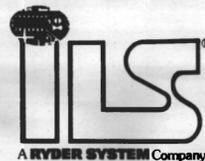
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Southwest Marine Awarded \$31 Million To Overhaul Cruiser

Southwest Marine, Inc., San Diego, Calif., has been awarded a \$31 million contract for the Regular Overhaul of the guided missile cruiser USS Sterett. The overhaul also includes a New Threat Upgrade (NTU), the Navy's program to upgrade combat systems on guided missile cruisers.

The ship is scheduled to enter the yard on July 8, 1991, with completion of the project set for August 7, 1992.

Tidewater Purchases Five Boats For Gulf Of Mexico Operations

Tidewater, Inc., New Orleans, La., recently announced that its marine division, Tidewater Marine Service, Inc., has purchased a fleet of five vessels for use in its Gulf of Mexico based operations.

The fleet of one 110-foot utility vessel and four offshore tugs was formerly operated by International Independent Towing, Inc., of Houma, La. The tugs range in horsepower from 5,600 to 3,000 and were built in 1982-83. The utility vessel was built in 1981. The purchase price was not disclosed.

Wider Pollution Coverage Insisted On By Banks Financing Oil Tankers

Unless shipowners are prepared to pay for additional insurance against the possible loss of a ship mortgage because of a pollution claim in the U.S., many banks are refusing to finance oil tankers. Also, it may not be possible to insure banks against such risks, leading liability brokers warn. U.S. banks are particularly exposed to this threat that could arise if a court, acting under the U.S. Oil Pollution Act of 1990, decided the provider of a ship mortgage was effectively a shipowner.

The same \$700 million maximum provided for shipowners and operators by protection and indemnity clubs is the only insurance available to the banks. That ceiling occasionally can be raised to \$1 billion, but even that falls short of the \$1.2 billion cost of the Exxon Valdez clean-up.

Baldt Celebrates 90th Anniversary

Baldt, Inc. of Chester, Pa., is celebrating its 90th anniversary. As a producer of product for the international market, Baldt indicates they will continue to expand their business based on what they do best: manufacturing some of the world's strongest, longest-lasting chain, anchor and related hardware products.

Baldt manufactures grades 2, 3, oil rig quality, and marine/railway

chain in sizes from 3/4-inch to 4 inches.

After winning "preferred" status from the U.S. Navy and other customers, Baldt is currently manufacturing at near capacity levels. A focus on plant modernization efforts will allow Baldt to remain competitive in the marketplace, while development of ventures with foreign manufacturers will increase product supply to support its international markets.

Today, new orders such as recently awarded contracts from Ingall's Shipbuilding and Naval Construction Battalion Center emphasize their commitment to the traditional markets that have supported Baldt over the years.

As a leading manufacturer and supplier of mooring system components, Baldt continues to target the marine and offshore industries, in addition to specialized industrial applications, strengthening their

representation by agents and distributors both nationally and internationally.

All of Baldt's products are certified to meet regulations of the American Bureau of Shipping, Lloyd's Registry, Det norske Veritas (DNV), the U.S. Navy and the American Petroleum Institute.

For more information about Baldt's products and services,

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shown as a digital LCD
readout on the hub.

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shown here is also available
in two double-function units
(ullage/interface and ullage/
temperature) and in a

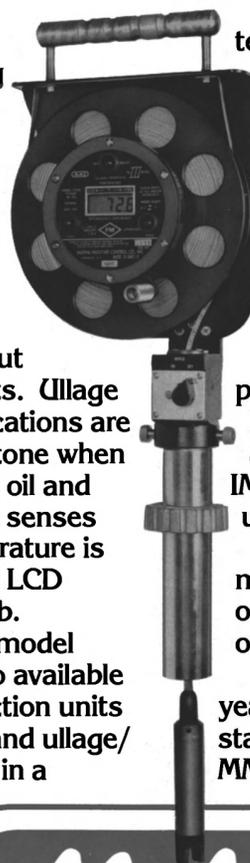
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Circle 22 on Reader Service Card

Krupp Atlas Introduces New Echosounders

Krupp Atlas Elektronik has extended its established range of DESO high-precision survey echo sounders with the introduction of new DESO 21 and DESO 22 models. Derived from the DESO 20, in service worldwide with leading survey

organizations and port authorities, both feature built-in annotator and serial data interface facilities.

DESO 21 is a low-cost single channel unit which can be fitted with any Krupp Atlas Elektronik transducer within a frequency range extending from 33 kHz to 210 kHz. Its price has been considerably reduced, making it suitable for those users who require a high quality echo sounder but whose budgets are

otherwise limited.

DESO 22 is a dual channel version designed for both shallow and deepwater applications. In addition to providing accurate depth data, it can also be used for acquisition of reliable information on bottom structures such as sediments, layers and wrecks. As with DESO 21, it can be deployed either as a portable sounder on small-size vessels or as part of fully integrated survey sys-

tems aboard larger craft.

Introduction of the new DESO 21 and 22 models complements Krupp Atlas Elektronik's present range of high-precision survey echo sounders, including the DESO 25 system designed for optimum performance over selectable measuring ranges down to 15,000 m.

For further information on the new echo sounders from Krupp Atlas Elektronik,

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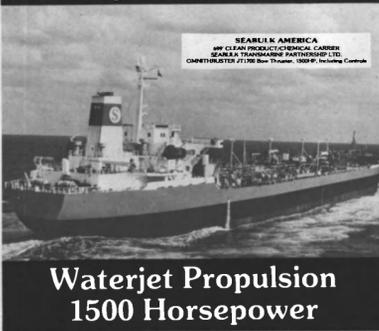
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Astronomical Drilling Rig Prices Anticipated Because Of Worldwide Demand

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The resulting rise in the cost of finding oil and getting it into production may slow future drilling activity unless oil prices rise, officials also warned.

They attributed the demand for rigs to be due to ambitious exploration and production programs that are under way simultaneously in many oil producing nations.

Kuwait, in addition, is expected to need an unspecified number of rigs to restore its crude oil output after hundreds of its wells were damaged or destroyed by Iraq's occupying forces.

The growing U.S. demand for rigs is also putting upward pressure on prices worldwide, but the largest price increase is expected to be outside the U.S.

Depending on what kind of rig is being used and where drilling is taking place, drilling rigs can cost from \$2 million to \$12 million each.

Astronomical rig prices within a matter of months is anticipated by an international exploration manager at a large oil company. In anticipation of the higher costs, he said his company is stepping up efforts to locate rigs for future use.

Oil exploration managers agree that long-term result of the rise in rig costs and oil-field development expenses will be higher crude oil prices.

MMA Trustees Nominate Adm. Peter H. Cressy As New President

Massachusetts Maritime Academy's (MMA) board of trustees has unanimously nominated Rear Adm. Peter H. Cressy as its choice for the school's new president. Admiral Cressy, a commander of the U.S. Navy's Fleet Air Mediterranean, headquartered in Naples, Italy, was chosen from more than 100 applicants and prospects.

The board of trustees' recommendation will now be sent to the board of regents of higher education, which is expected to give its approval and make a formal announcement at its next meeting. It is anticipated that Admiral Cressy will become president in July, replacing John F. Ayler, who offered his resignation.

Maritime Reporter/Engineering News

**Southwest Marine
Awarded \$31 Million
To Overhaul Cruiser**

Southwest Marine, Inc., San Diego, Calif., has been awarded a \$31 million contract for the Regular Overhaul of the guided missile cruiser USS Sterett. The overhaul also includes a New Threat Upgrade (NTU), the Navy's program to upgrade combat systems on guided missile cruisers.

The ship is scheduled to enter the yard on July 8, 1991, with completion of the project set for August 7, 1992.

**Tidewater Purchases
Five Boats For Gulf
Of Mexico Operations**

Tidewater, Inc., New Orleans, La., recently announced that its marine division, Tidewater Marine Service, Inc., has purchased a fleet of five vessels for use in its Gulf of Mexico based operations.

The fleet of one 110-foot utility vessel and four offshore tugs was formerly operated by International Independent Towing, Inc., of Houma, La. The tugs range in horsepower from 5,600 to 3,000 and were built in 1982-83. The utility vessel was built in 1981. The purchase price was not disclosed.

**Wider Pollution Coverage
Insisted On By Banks
Financing Oil Tankers**

Unless shipowners are prepared to pay for additional insurance against the possible loss of a ship mortgage because of a pollution claim in the U.S., many banks are refusing to finance oil tankers.

Also, it may not be possible to insure banks against such risks, leading liability brokers warn. U.S. banks are particularly exposed to this threat that could arise if a court, acting under the U.S. Oil Pollution Act of 1990, decided the provider of a ship mortgage was effectively a shipowner.

The same \$700 million maximum provided for shipowners and operators by protection and indemnity clubs is the only insurance available to the banks. That ceiling occasionally can be raised to \$1 billion, but even that falls short of the \$1.2 billion cost of the Exxon Valdez clean-up.

**Baldt Celebrates
90th Anniversary**

Baldt, Inc. of Chester, Pa., is celebrating its 90th anniversary. As a producer of product for the international market, Baldt indicates they will continue to expand their business based on what they do best: manufacturing some of the world's strongest, longest-lasting chain, anchor and related hardware products.

Baldt manufactures grades 2, 3, oil rig quality, and marine/railway

chain in sizes from 3/4-inch to 4 inches.

After winning "preferred" status from the U.S. Navy and other customers, Baldt is currently manufacturing at near capacity levels. A focus on plant modernization efforts will allow Baldt to remain competitive in the marketplace, while development of ventures with foreign manufacturers will increase product supply to support its international markets.

Today, new orders such as recently awarded contracts from Ingall's Shipbuilding and Naval Construction Battalion Center emphasize their commitment to the traditional markets that have supported Baldt over the years.

As a leading manufacturer and supplier of mooring system components, Baldt continues to target the marine and offshore industries, in addition to specialized industrial applications, strengthening their

representation by agents and distributors both nationally and internationally.

All of Baldt's products are certified to meet regulations of the American Bureau of Shipping, Lloyd's Registry, Det norske Veritas (DNV), the U.S. Navy and the American Petroleum Institute.

For more information about Baldt's products and services,

Circle 56 on Reader Service Card

**There's no easier (or more accurate)
way to get a complete tank profile.**

**A Flexi-Dip™
Trimode™ gauging
tape measures
ullage, interface
and temperature
with the same
tank penetration.**

That's right, one dip tells you everything you want to know about the tank's contents. Ullage and interface indications are audible: a steady tone when the probe reaches oil and beep-beep when it senses water. The temperature is shown as a digital LCD readout on the hub.

The restricted model shown here is also available in two double-function units (ullage/interface and ullage/temperature) and in a

temperature-only version.

This makes it easy to match the model to your requirements, buy only what you need. (The Flexi-Dip series also offers the same single-, double- and triple-function options in open-gauge models.)

MMC tapes are approved as intrinsically safe by FM, BASEEFA, CSA and SAA, and are also IMO-approved for tank-ship use.

All MMC tapes are dual marked in feet and inches on one side, metric on the other.

One final fact: Over 30 years of proven performance stand behind our products. MMC is a name you can trust.



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Japan
Phone: 078-251-1033
Telex: 5624163 OPECK J
Fax: 078-252-0265

Circle 22 on Reader Service Card

Krupp Atlas Introduces New Echosounders

Krupp Atlas Elektronik has extended its established range of DESO high-precision survey echo sounders with the introduction of new DESO 21 and DESO 22 models. Derived from the DESO 20, in service worldwide with leading survey

organizations and port authorities, both feature built-in annotator and serial data interface facilities.

DESO 21 is a low-cost single channel unit which can be fitted with any Krupp Atlas Elektronik transducer within a frequency range extending from 33 kHz to 210 kHz. Its price has been considerably reduced, making it suitable for those users who require a high quality echo sounder but whose budgets are

otherwise limited.

DESO 22 is a dual channel version designed for both shallow and deepwater applications. In addition to providing accurate depth data, it can also be used for acquisition of reliable information on bottom structures such as sediments, layers and wrecks. As with DESO 21, it can be deployed either as a portable sounder on small-size vessels or as part of fully integrated survey sys-

tems aboard larger craft.

Introduction of the new DESO 21 and 22 models complements Krupp Atlas Elektronik's present range of high-precision survey echo sounders, including the DESO 25 system designed for optimum performance over selectable measuring ranges down to 15,000 m.

For further information on the new echo sounders from Krupp Atlas Elektronik,

Circle 27 on Reader Service Card

LIVE AND LET LIVE

Other people have as much right to live as we have, and all of us have failings, so to remain on friendly terms with our competitors, we should overlook their shortcomings.

This does not mean that you have to do such. Why take unnecessary risks. Profit from the experience of Willem Pot, founded in 1899, with a proven trackrecord when it comes to marine trading.

Situated near the harbour of Rotterdam, the company keeps one of the largest stocks of marine equipment in the world. Anchors, chaincables, lifeboats and much more, ready for delivery.

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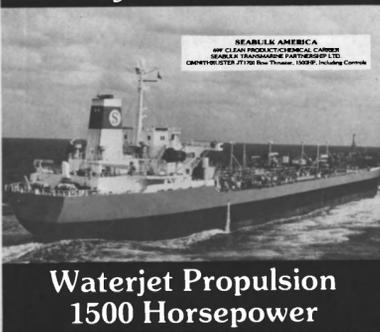
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OMNITHRUSTER® Thrust Is Forwards And Sideways And Backwards



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- Fuel Savings

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- Easily retrofitted.



Micro-Processor Control System, Model 1200A with gyro input . . . holds vessel's heading. System also accepts compatible NAV/AIDS fore aft and slow-speed propulsion and positioning.

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OMNITHRUSTER ship control systems* utilize individual module thrusters of up to 3000 HP in any combination to produce desired forward or lateral net thrust. Prime movers for the Modular Thruster System may be electric, hydraulic or diesel powered in conjunction with manual/automatic or integrated control networks.

ADVANTAGES FOR LARGE VESSELS . . .

- Incremental Thrust Capability
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Cable Address Omnithrust

ASNE-BOOTH 163

Circle 288 on Reader Service Card

Astronomical Drilling Rig Prices Anticipated Because Of Worldwide Demand

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Maritime Reporter/Engineering News

Far East Levingston Reports Big Profit Gain

For the year through last December 31, Far East Levingston Shipbuilding Ltd. recorded net profit of \$17 million, or 24 Singapore cents a share. This is the best result in six years and contrasts with 17 Singapore cents a share reported in 1989.

For 1991, the main jobs in hand are a second cable ship for American Telephone & Telegraph Co., and a harsh-environment drilling rig for Santa Fe International Corp. unit of Kuwait Petroleum Co. Several repair jobs are also on the books.

A spokesman said Far East Levingston's yards in Singapore will be busy until end-1992, and that while operating costs in Singapore, especially subcontract labor, are likely to increase, profits for the group are expected to be sustained.

Smith/Donham To Expand Overseas Operations For International Compactor

International Compactor, Inc. of Hilton Head Island, S.C., recently announced their association with Smith/Donham Innovations of Houston, Texas.

This cooperative venture authorizes SDI to expand the ICI trash compactor into the foreign marketing areas not presently being served by ICI. SDI devotes their total efforts toward representing systems, services, and products whose sole purposes are to improve environmental conditions. This joint venture between ICI and SDI is expected to expand the current success of the ICI trash compactor now installed on numerous Navy ships, tankers, ore carriers, cruise ships, research vessels and offshore platforms. Other ICI product lines to be represented by SDI will be an aluminum/steel can crusher and heavy duty industrial balers.

SDI will feature the ICI trash compactor and the aluminum/steel can crusher at the 1991 Offshore Technology Conference in Houston, Texas, May 6-9.

For further information and free literature on products from International Compactor,

Circle 36 on Reader Service Card

Murphy's All-New Gage and Control Catalog Pictures Over 80 Products

A new condensed catalog from Frank W. Murphy Mfr., Tulsa, Okla., describes products from gages to complete control systems.

All-new for 1991, the catalog contains photos and specifications for over 80 products. Many new products are included, such as dual set point pressure and temperature monitors, a thin film pressure transmitter, a simplified gen-set controller, a digital hourmeter and a digital tachometer.

The publication devotes complete

April, 1991

pages to pressure/vacuum gauges and controls; temperature gauges and controls; level gages and controls; speed time vibration; magnetic switches and Tattle Tales® which translate Switchgage® or other switch signals into alarm or shut-down functions; engine panels; automatic start-stop controls; and control systems and valves.

Murphy instruments and controls are crafted of heavy-duty industrial

quality materials. Many special features are added to assure the accuracy of these instruments and controls.

Frank W. Murphy Mfr. now offers sales and service in eight locations worldwide with the addition of an office in San Luis Potosi, Mexico. This central location will offer more convenient customer service for Mexico and Central and South America.

Murphy's well-established line of mechanical and analog instruments and controls now includes, in addition to the new genset controller, digital readout instruments, a series of microcontrollers, as well as other new products.

For further information and a free copy of Murphy's new 1991 condensed catalog,

Circle 32 on Reader Service Card



When You Look At Everything You Put Into A Barge, You Should Expect A Lot Out Of It.

You put a lot into a barge. It carries whatever you ship. But you carry it, too: On your books. For about 25 years, if it's built by Jeffboat.

So you'd better get a lot out of it.

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So before you put a lot into a barge, think about what you expect out of it. Then think Jeffboat. It's a name

that carries a lot of weight. And delivers. Call 812-288-0200 for a new brochure today.

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61

Nordic Machine Expands Line Of Anchor Winches

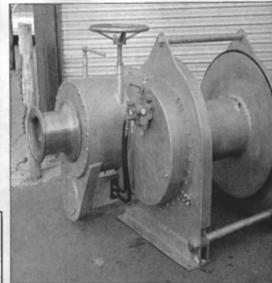
Nordic Machine & Manufacturing, Seattle, Wash., has expanded its line of stock anchor winches with the new 40-30-3000. This 40-inch-diameter by 30-inch-wide galvanized drum winch has a full drum line pull of 15,000 pounds enabling a maximum anchor capacity of 3,000

pounds. The winch can hold 970 feet of 1-1/4 cable plus 65 feet of 1-1/4 chain.

Like all of Nordic Machine's reduction anchor winches, all drive components run in an enclosed oil bath. This includes reduction components, clutch, and band brake. The 40-30-3000 also features a 10-inch-diameter cast iron capstan with up to 13,000-pound line pull. A

positive stop dog is included to protect the drive from mooring shocks.

Nordic Machine & Manufacturing prides itself on its ability to serve the diverse needs of its customers with wide-ranging capabilities. These include welding of steel, aluminum and stainless; lathe capacity up to 40 inches in diameter and up to 14 feet on length; custom machine design and fabrication; an-



Nordic Machine's new 40-30-3000 anchor winch.

chor winches; net reels; drag winches; sounding winches; long line haulers 17-inch and 24-inch; fish strippers and chutes; long line reels; side rollers; two winches; capstans; headline winches; seine winches; hydraulic tanks and power units; power take-off adapters; yacht winches; and gill net reels.

Nordic Machine & Manufacturing has built its 40-year reputation on hydraulic machine design, manufacture and rebuilding.

For more information and free literature,

Circle 25 on Reader Service Card

There's a WESTFALIA system that answers every oil purification need

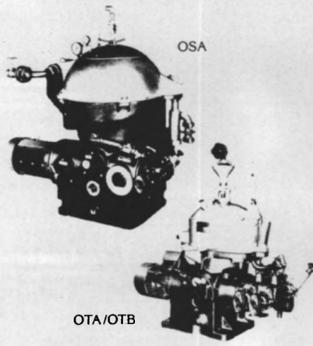
Highest oil purity Westfalia Oil Purifiers remove water and sediment from heavy fuel oils at top efficiency... at densities up to 1010 kg/m³ and cat fines down to 1 ppm. Our *exclusive* two-stage UNITROL/SECUTROL system gives unmatched purity even under widely varying feed conditions.

UNITROL, with no ring dams, performs the basic oil/water/solids separation. SECUTROL assures maximum solids and water removal... while monitoring de-sludging intervals. Together, they provide the highest HFO quality now obtainable.

Top reliability. Built-in ruggedness and sturdy design give Westfalia Oil Purifiers a record of reliability unmatched by any competitive system... perfect for tough marine service conditions.

Complete monitoring. Westfalia systems allow monitoring of such vital functions as oil flow, oil temperature, increased

Whether your engines are powering a huge ocean-going cargo vessel or a small service boat, there's a Westfalia Oil Purification System that suits them best.



Westfalia is proud to be part of the ongoing construction program of the new and growing U.S. Navy.

water discharge, oil break-over, failure to shoot, motor temperature, vibration, and excessive number of second-stage solids or water discharges. Control stations, with audible and visual alarms, can be located remotely and/or at the equipment site.

Preassembled modules. Westfalia Oil Purifiers are available as single machines or as preassembled "Centri-Pack" modules, with heaters, pumps, strainers, controls, wiring, etc. installed and ready to go.

Rapid, expert service. With every Westfalia Oil Purification System you get Centrico expertise, to help design, install, and service your equipment. At any port — Atlantic, Pacific, Gulf — skilled engineering advice and assistance, as well as parts, are usually available overnight — or sooner.

Westfalia systems and Centrico service... in any engine room, they're the best answer for your oil purification requirements.

See us at ASNE, Booth #602



Centrico, Inc.
100 Fairway Court / Northvale, N.J. 07647
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Circle 29 on Reader Service Card

ZF Extends Range Of Marine Transmissions

With the introduction of the BW 195A, the German firm ZF is able to extend its existing range of "down-angle" marine transmissions with inclined output shafts.

Although it has, until now, always been standard practice to offer transmissions with inclined output shafts for the lower end of the performance range, it has by no means been common in the performance range of the BW 195A. BW 195A marine transmissions are capable of transmitting engine powers of between 550 and 850 kw, depending on their type of application and shaft speed. This places them firmly in what is at present the most popular performance range for yachts and sportfishermen. These transmissions have a shaft inclination—or down-angle—of 10 degrees.

The advantage of inclined outputs is that the engine room can be designed in a much more favorable way. In most cases, the engine can be mounted horizontally, considerably reducing the amount of headroom required. This feature is particularly advantageous in vessels with planing hulls.

The BW 195A range can be supplied with the following ratios, each of which is used for ahead and/or astern travel: 1.260:1, 1.488:1, 1.769:1, 1.972:1 and 2.484:1. Input speeds can range from a maximum of 2,500 rpm to a minimum of 450 rpm.

For further information and free literature from ZF,

Circle 16 on Reader Service Card

**Marinette Marine
Names Gulling CEO
And President**



Daniel Gulling

Daniel Gulling has been appointed president and chief executive officer of Marinette Marine Corporation in an announcement made recently by board chairman Roger Derusha.

Mr. Gulling most recently was executive vice president and chief operating officer of Cruistar Incorporated of Oconto, Wis. He has held division managerial positions with FMC Corporation, Boise Cascade, Mead Corporation, and worked in the Pentagon as an analyst in the Office of the Secretary of Defense.

Mr. Derusha, past president and chief executive officer, had previously announced his intentions to retire. He will continue his present position as chairman of the board of directors.

**Circle Seal Offers 4-Page
Condensed Brochure
On Relief Valves**

Circle Seal Controls, Inc. of Anaheim, Calif., has published a four-page condensed brochure that provides technical data and specifications on the complete industrial line of Circle Seal Relief Valves.

Circle Seal Relief Valves, available in pipe sizes from 1/8-inch to 1-1/4-inch, are designed for a wide range of cracking pressures from 15 to 13,000 psi and provide dead tight reseal after crack.

For additional information and a free copy of the four-page condensed brochure from Circle Seal Controls,

Circle 46 on Reader Service Card

**TWRA Members Adjust
Rates Previously Set For
U.S. Exports To Far East**

Members of the TransPacific Westbound Rate Agreement (TWRA), which set rates together for moving U.S. exports to the Far East, are increasing one of their surcharges, decreasing another, and boosting rates for some commodities. The carriers claim the price adjustments are necessary to accommodate the rise in exports.

The eight carriers of the rate-

making group boosted its origin terminal receiving charge April 1 by \$20 for every 40-foot and 45-foot container, bringing the total surcharge to \$380. For a 20-foot container, or TEU, the increase was \$16, making the total surcharge \$341. Other cargoes increased by \$1 a revenue ton across the board. Per package shipments increased 2 cents a unit. Charges for other per-

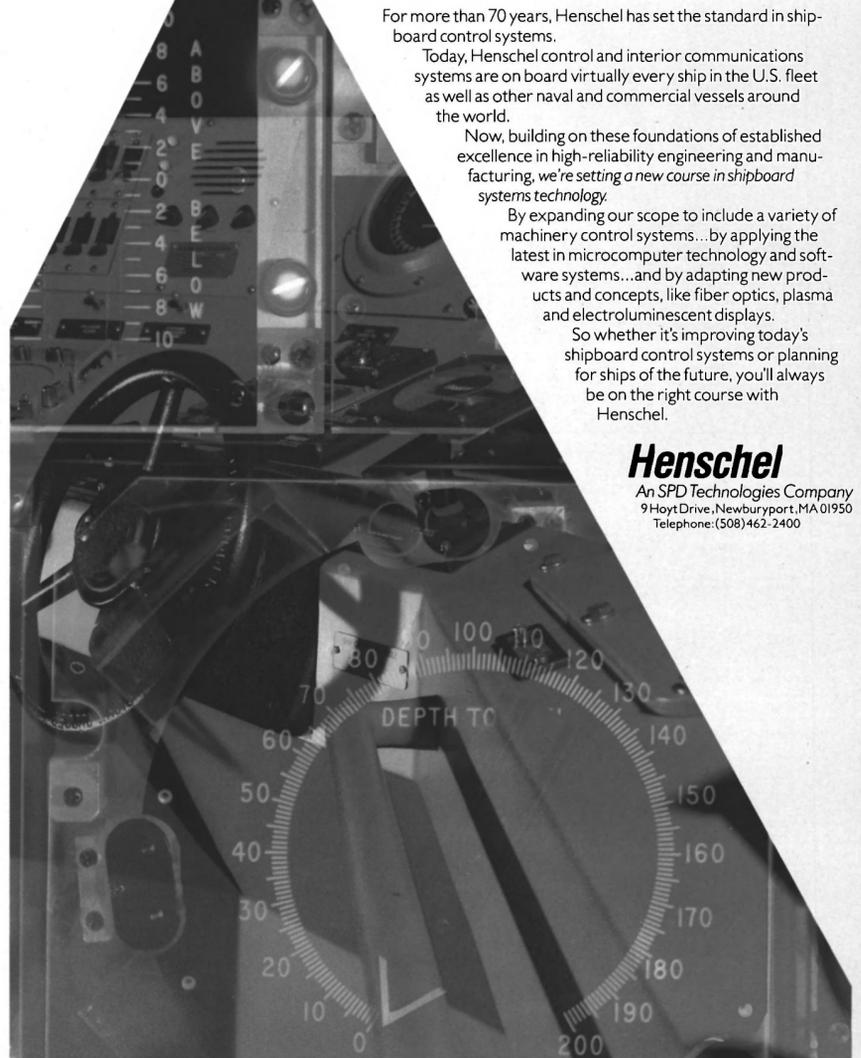
unit shipments rose by 1 percent.

The fuel surcharge was reduced on March 1 to \$160 for a 40-foot container, or FEU, and \$128 a TEU. The previous fuel surcharge was \$200 an FEU and \$160 a TEU.

The conference also raised rates on several commodities, which are in addition to an overall commodity pricing plan announced in December.

TWRA members include Neptune Orient Lines Ltd., Singapore; Nippon Liner System Ltd., Tokyo; Nippon Yusen Kaisha, Tokyo; Sea-Land Service Inc., Edison, N.J.; American President Lines Ltd., Oakland, Calif.; Kawasaki Kaisen Kaisha Ltd., Tokyo; A.P. Moller-Maersk Line, Copenhagen, Denmark; and Mitsui O.S.k. Lines Ltd., Tokyo.

Setting a New Course in Shipboard Systems Technology



For more than 70 years, Henschel has set the standard in shipboard control systems.

Today, Henschel control and interior communications systems are on board virtually every ship in the U.S. fleet as well as other naval and commercial vessels around the world.

Now, building on these foundations of established excellence in high-reliability engineering and manufacturing, we're setting a new course in shipboard systems technology.

By expanding our scope to include a variety of machinery control systems...by applying the latest in microcomputer technology and software systems...and by adapting new products and concepts, like fiber optics, plasma and electroluminescent displays.

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**Sea Recovery Offers
Compact, Commercial
R.O. Desalinator**

With watermaking capacities between 1,300 and 4,000 U.S. gallons (4,920-15,140 liters) per day, commercial fishing vessels, smaller workboats, as well as onshore facilities such as private residences, vil-

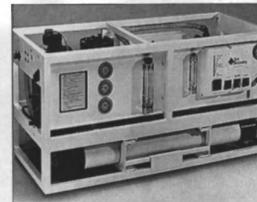
las, and smaller hotels, make use of Sea Recovery's most compact and easily maintained commercial R.O. desalinator.

Unique among watermakers, Sea Recovery delivers R.O. systems with everything included, ready to produce water immediately after installation. All necessary plumbing for onboard use is also supplied.

Constructed with a lightweight, epoxy-coated frame, the unit uti-

lizes only the highest quality marine-grade materials and components. Models SRC 5M3 through SRC3 15M3 include a one-year warranty on parts and features include a booster pump, oil/water separator, two commercial grade prefilters for improved water quality and extended filter quality, and a temperature compensated salinity probe.

Upgrading a model to higher watermaking capacity is done by simp-



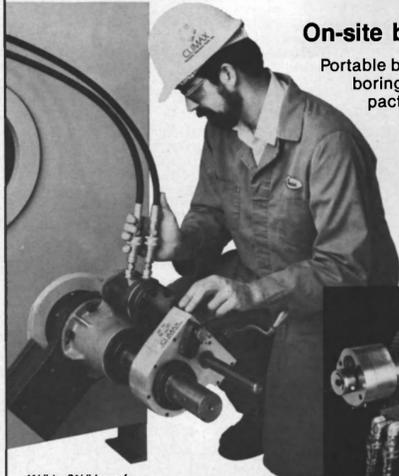
Sea Recovery delivers R.O. systems ready to produce water immediately after installation.

ly installing additional membranes. For more information and free literature on Sea Recovery watermakers,

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Portable boring bars mount right on the workpiece to do line boring, facing, drilling, threading, and trepanning. Compact rotational drive units allow use in confined areas.

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Chain & Fittings**

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(713) 337-6194

Circle 310 on Reader Service Card

**Brazilian Operator Expands
Service To U.S. East Coast**

Companhia Marinha Maritima Nacional SA, a Brazilian liner operator, recently expanded its U.S. Gulf Coast container service to include calls at U.S. East Coast ports.

The new container service recently began when the boxship Nacional Sao Paulo departed the Port of Rio Grande, Brazil, for stops at 12 Brazilian and U.S. ports on its way to Norfolk.

Companhia Marinha Maritima Nacional will initially call every 20 to 30 days at Brazilian ports. Following the expansion of service, calls will increase to every 15 days.

The company plans to use three ships, two chartered, on its East Coast route.

The expansion was made possible by Brazil's recent deregulation of the merchant marine.

**Dayton T. Brown Installs
Navy Shock Machine—
Literature Available**

Dayton T. Brown, Inc., Engineering and Test Division, Bohemia, N.Y., has completed construction of the Mil-S-901 (Navy) high impact medium weight shock machine.

The medium weight shock machine employs a 3,000-pound hammer which swings through a 72-inch arc impacting an anvil on which the test item and fixtures are mounted. The impact simulates shipboard and submarine shocks encountered by all types of ships machinery, electrical equipment, and structures as a result of underwater detonations and heavy gunfire.

The purpose of the medium weight shock test is to verify that the equipment being installed aboard naval ships and submarines will withstand shock pulses that could occur during battle conditions.

For free literature detailing the engineering and testing services of Dayton T. Brown,

Circle 80 on Reader Service Card

Singapore Introduces Tax Plan To Lure Foreign Shipowners

The Singapore Government recently announced a tax exemption plan for foreign shipping companies in a move to encourage owners to relocate to the country. The announcement came on the heels of a similar action by Canada.

Singapore's plans were announced by its finance minister **Richard Hu**, who said that the income of approved resident shipping companies from the operations of their non-Singapore flag vessels would be exempt from tax under an Approved International Shipping Enterprise Scheme scheduled to take effect from the 1992 year of assessment.

The move by Singapore is expected to draw at least 100 ships in its first year and generate as much as \$72 million per year.

In an effort to transform Vancouver

into a major maritime center, Canada had announced changes to its tax laws to allow foreign owners to set up headquarters in the country without being taxed on their world holdings. The Canadian tax changes came into effect at the end of February.

Louisiana Officials Create Oil Spill Cleanup Tax

A fund to clean up oil spills that calls for a two-cents-per-barrel tax on crude oil transferred from barges or tankers at marine facilities in the state is being created by Louisiana officials.

Estimated at \$10 million annually, the fund would be administered by a coordinator within the office of Gov. **Buddy Roemer**. According to **Ron Gomez**, Louisiana's secretary of the Department of Natural Resources and chairman of the governor's Oil Spill Task Force, which crafted the tax plan.

The proposal, which will now go to Governor **Roemer** for inclusion in his legislative package, is expected to be strongly supported by the governor, who created the task force to protect the state's coastline from the threat of oil spills.

Loosely modeled on a similar measure under consideration in Texas, the Louisiana version would allow individuals to seek money from the funds to pay for damages caused by oil spills.

The \$10 million level is below the \$50 million requested by the state Department of Environmental Quality. To raise \$50 million, the tax on oil would have to be nearly 10 cents a barrel.

Kerr Becomes U.S. Agent For Brazil's Nacional Line

Under a recently completed deal, Kerr Steamship Co. is to become the sole U.S. agent for the Brazilian ship line Companhia Maritima Nacional SA, replacing Norton Lilly

International, which had served as Nacional Line's agent in the U.S. since 1983.

Nacional Line recently inaugurated service to U.S. East Coast, after 15 years of service between Brazil and U.S. Gulf of Mexico ports. **Frank J. Martingale**, vice president of Kerr, said the agency switch reflects the ship line's desire to secure services of a more national scope.

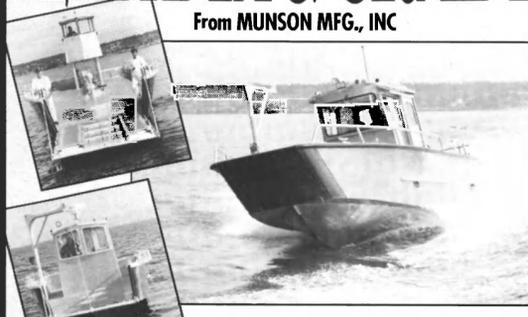
Nacional Line, which is initially employing two ships calling at 20-day intervals at New York, Philadelphia, Baltimore, Norfolk, Va., and Savannah, Ga., plans to add a third ship soon, shortening the time to 15 days.

With a new agent and expanded service, privately owned Nacional Line is in position to take advantage of both the recent deregulation of Brazil's maritime industry and the collapse of Lloyd Brasileiro. Kerr has extensive intermodal and sales networks to assist Nacional in expanding its business, Mr. **Martingale** said.

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**McDermott Awarded
Marathon Oil Contract**

McDermott Marine Construction, a major operating unit of McDermott International Inc., has been awarded a contract for Marathon Oil Company for the fabrication and installation of an eight-skirt pile jacket, piles and deck. Fabrication of the jacket and piles, which began in February, is

scheduled to be completed by February 1992. The jacket will be fabricated at McDermott's Harbor Island facility in Aransas Pass, Texas.

The offshore installation of the jacket, piles and deck is scheduled for March 1992. The platform will be located in South Pass Block 89C in the Gulf of Mexico in 385 feet of water.

McDermott Marine Construction is a major operating unit of McDermott International, a leading world-

wide energy services company which, with its subsidiaries provide engineering and construction services to the oil and gas industry offshore and for industrial and utility facilities onshore. McDermott also manufactures steam-generating equipment, defense products and tubular products.

For more information and free literature on McDermott, Circle 41 on Reader Service Card

**DNV Grants Quality
Certificate To Wartsila**

The international classification and certification society Det norske Veritas has granted Wartsila Diesel's Vasa factory ISO 9001 certification in recognition of the effectiveness of the factory's quality system. The ISO 9001 quality system covers Wartsila Diesel operations from marketing to after sales service. It is expected to guarantee the competitive efficiency of Wartsila Diesel's Vasa engines on the international market.

ISO 9001 is an international quality standard known widely on the international market. The certificate now granted Wartsila Diesel is a result of a concerted effort to improve quality at the company's Vasa unit. The entire personnel was involved in the effort. A quality development team was set up to support and coordinate overall quality development and has also created the means for monitoring, controlling and maintaining the factory's quality system in the future.

Wartsila Diesel Group is one of the world's leading suppliers of medium-speed engines for marine and power plant installations. Wartsila Diesel's Vasa factory is the design and development center for the company's Vasa 22, 32 and 46 engines.

For free literature on Wartsila Diesel engines, Circle 26 on Reader Service Card

**Jered Brown Bros. Expands
Manufacturing Capability
By Leasing Georgia Facility**

Marine systems manufacturer Jered Brown Brothers has leased a vacant 44,000-square-foot manufacturing facility in Brunswick, Ga., in order to accommodate its growing marine equipment business and to expand its capabilities in the manufacture of large structural fabrications and hydraulic assemblies.

The company's new facility—on a 10-acre site in an industrial complex on the Brunswick River—is located adjacent to the Georgia Port Authority's deep-water facilities in Brunswick.

Brunswick is approximately 75 miles from Savannah to the north and Jacksonville to the south.

Jered specializes in shipboard equipment for the U.S. Navy, including elevators for aircraft, cargo and weapons, ship steering systems, submarine bow planes, anchor windlasses and specialized handling systems.

Jered president R.J. (Rick) Edger said the facility will provide his company with needed water shipment capability and floorspace for its marine fabrication work. Besides the new facility, Jered has two other plants in the metro Detroit area with a combined total of 150,000 square feet.

For free literature detailing the marine shipboard equipment offered by Jered Brown Brothers, Circle 65 on Reader Service Card

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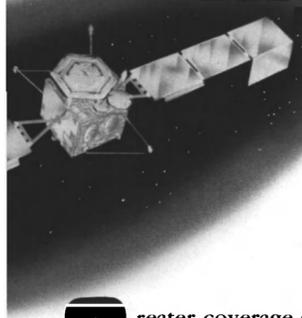
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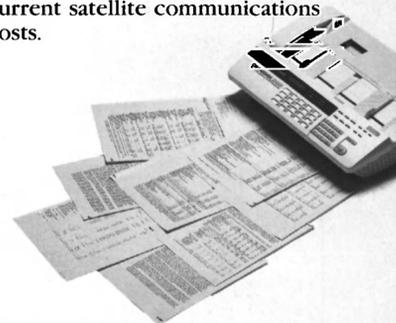
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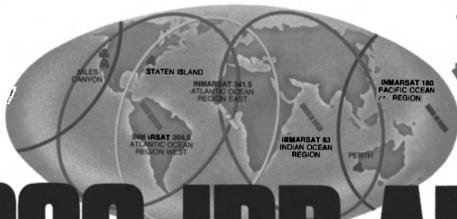
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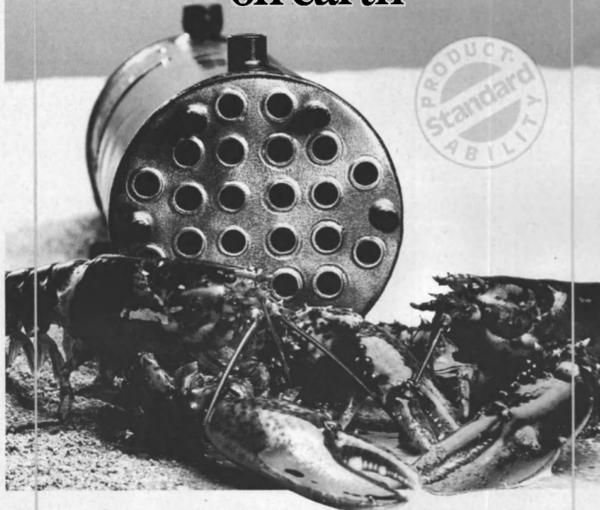
**IROC '91 Conference
Set For Pittsburgh,
May 14-16, 1991**

The Inland Rivers Opportunity Conference (IROC '91) has been announced for Pittsburgh, Pa., May 14-16, 1991.
Sponsored by Viking Maritec,

Inc., the conference will feature guest speakers from the areas of marine law, insurance, commodities, builders, fleet operators, finance, and regulatory agencies.

For registration information, contact: IROC '91, Suite 211, 3000 Montour Place, Montour Church Road, Oakdale, Pa. 15071, phone (412) 787-4440, or Fax (412) 787-4491.

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The 2,640-grt Albacora, said to be the largest tuna purse seiner at 344 feet, was recently delivered by Hijos de J. Barreras.

**World's Largest Seiner
Delivered By AESA**

Spanish shipbuilder Hijos de J. Barreras, part of Astilleros Espanoles S.A. (AESA), recently delivered the 344-foot Albacora, what is believed to be the world's largest tuna purse seiner.

To be operated by Albacora Company in the Indian Ocean from her base at Seychelles, the Albacora has a 3,000-cubic meter frozen hold capacity and the tuna will be frozen in 26 fish tanks by a Grasso refrigeration system. Six compressors with unit capacities of 103,000 kcal/hr cool the brine which is circulated around the tanks.

The original project was undertaken by CINTRAMAR and final project and development by CINTRANAVAL, S.A. in Las Arenas (Vizcaya) in close cooperation with the technical department of the vessel's owners, Albacora S.A.

The Albacora's hull lines were studied and optimized at the El Pardo Hydrodynamic Experiment Unit (Canal de Experiencias Hidrodinamicas de El Pardo) where various tests were conducted on two scale models. Models of various lengths were tested to determine the optimum parameters which would produce a hull with significant fuel consumption reduction qualities under average operational conditions.

The seiner uses a supercharged Krupp MaK 6MU four-stroke diesel engine producing 7,000 hp at 400 rpm. The power/revolutions per minute ratio is optimized to provide minimum fuel consumption under normal operating conditions. The engine drives a CLT screw, specially designed by Sistemar, via a 3.23:1 Renk-Tacke SWV 112 reduction gear and a Vulkan-Rato elastic coupling.

The engine can be controlled from the bridge, wings and plat-

ALBACORA Equipment List	
Main engine	Krupp MaK
Reduction gear	Renk-Tacke
Propeller	Sistemar
Elastic coupling	Vulkan-Rato
Windlass	Marco
Generator engines (5)	Caterpillar
Alternators (5)	Indar
Emer. generator engine	Caterpillar
Freshwater generators	Atlas
Fuel purifier	Alfa-Laval
Various winches & fishing equipment	Marco
Freezer plant & A/C	Greco Iberica
Fish finder, echo sounder, direction finder, radars, satnav, navtex receiver, various electronics	Furuno
Satnav system	Magnavox
VHF radiotelephones, watch receiver, SSB	Sailor
Gyrocompass & autopilot	Sperry

form.

The tailshaft is made of stainless steel and the oil-lubricated bush has Cedervall fastenings and Railko caps.

Electrical power is provided by five Caterpillar 3508 TA four-stroke diesel engines, rated at 1,000 rpm and five Indar RLC-450-M alternators generating 550 kw at 380 V, 50 Hz, with static regulation.

For emergency generation, there is a Caterpillar 3406 TA diesel engine which can supply 200 kw, 380 V at 50 HZ at 1,500 rpm and driving an Indar alternator.

Individual air-conditioned accommodations have been provided for 26 crew members and officers.

A helipad above her wheelhouse will carry a helicopter for spotting tuna schools.

For free literature detailing the shipbuilding services of AESA,

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**Santa Fe Looks
To Sell Drill Unit**

Santa Fe Drilling Equipment Co., Alhambra, Calif., recently requested permission from the Maritime Administration to sell a drilling unit and transfer it to the Panamanian registry.

The purchaser of the unit is a subsidiary of Santa Fe located in the Grand Cayman Islands, Santa Fe Drilling Operations Inc.

The 4,038-gt Key Hawaii was built in 1983 in Tamano, Japan.

If the sale and registry transfer are approved, the Key Hawaii will be used in worldwide drilling operations.

Maritime Reporter/Engineering News

A.P. Moller Changes Double-Bottomed VLCC Order To Double Hulls

An order with Odense Staalskibs-vaerft for five double-bottomed VLCCs of conventional construction has been changed by A.P. Moller of Copenhagen to an order for six 200,000-dwt, double-hull tankers. The change, according to the company, was prompted by international developments aimed at countering oil pollution, which have gained momentum since the first order was placed early last year. Delivery of the new tankers, originally scheduled for 1992-93, is now set for 1992-94.

IMO Delaval Appoints Neff Manager, Petrochemical And Power Generation

Richard L. Neff has been appointed manager, petrochemical and power generation of the Delaval Turbine Division of Imo Industries Inc., it was announced by Bern E. Deichmann, manager, commercial operations. Mr. Neff has been with Delaval Turbine for 20 years. In his new position, he will be responsible for petrochemical markets including ammonia, methanol, ethylene plant centrifugal compressors, and mechanical drive steam turbines, as well as steam turbine generators for power generation.

U.K. Likely To Require More Ships To Transport Equipment Back From Gulf

The U.K.'s Ministry of Defence has several ships still on charter that were deployed during the military buildup in Saudi Arabia, but will require many more to transport equipment back home now that the war is over. An estimated 142 voyage charters were arranged by U.K. authorities preceding the war, with only nine of the voyage charters involving U.K.-flag ships. The Baltic Exchange broker who represents the Ministry of Defence in the London ship charter market, Richard Bilton, said he had not received any instructions yet about homeward seaborne transportation arrangements. The General Council of British Shipping said that with less urgency surrounding the operation to transport equipment back to Europe, there should not be so much upward pressure on charter rates.

MSE Offers 28-Page, Full-Color Brochure On Shipbuilding & Services

Malaysia Shipyard and Engineering (MSE), Johor, Malaysia, has published a 28-page, full-color brochure on the facilities, capabilities

and services offered by its ship repair, engineering and shipbuilding divisions.

The yard is located on 300 acres of land by the Straits of Johor at the southern tip of the Malayan Peninsula. About 120 acres have been developed to cover three operating divisions: ship repair, engineering and shipbuilding. Each of the operating divisions has a full range of independent facilities to meet individual needs but with flexibility for

close coordination in their use and the interflow of the work force.

Another 60 acres have been developed for the rolling stock manufacturing complex. The remaining acreage by the seafront is progressively developed for offshore engineering and jacket and steel fabrication in the future.

Facilities at the yard, which has plenty of space, include 400,000-dwt and 140,000-dwt drydocks, 500-ton Shiplift Systems with transfer pit,

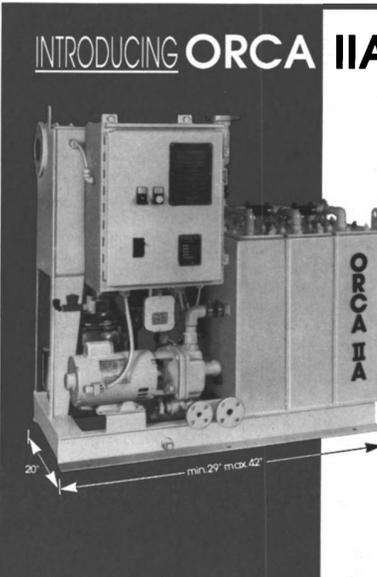
and rolling stock manufacturing workshop, stores, painting shop and related services.

The generously illustrated brochure provides much information on MSE's operation, and also contains maps showing its location, as well as a layout plan of the yard.

For more information and a free copy of MSE's 28-page, full-color brochure,

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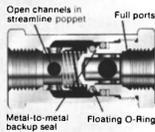
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50,000-GRT 'Costa Classica' Launched At Fincantieri's Marghera Yard

The recent launching of the 50,000-grt Costa Classica, Costa Crociere's flagship, at Fincantieri's Marghera, Venice, shipyard was hailed by a Costa official as the return of the "golden age of great Italian cruise liners." Dr. Nicola Costa, president of the Costa Crociere Group, and Dr. Corrado Antonin, Fincantieri's managing director and general manager, were on hand for the ceremonies.

"The launching of the Costa Classica represents a return to the golden era of great Italian cruise liners," said Dr. Costa at a recent press conference. "The construction of this liner is part of Costa Crociere's extensive investment program, aimed at renewing and expanding its fleet, which by 1994, will include 10 cruise liners and put Costa Crociere fifth in the world market."

"The Costa Classica is not an Italian ship simply because it is Italian-owned, or because it has been built in Italy, home of the most important

passenger ship construction industry in the world," continued Dr. Costa, "it is Italian in its design, its style, its furnishing, symbolizing a way of life at sea which has come to be known as 'cruising Italian style.'"

Expected to be operated in the Caribbean, the largest cruise market in the world, the Costa Classica will have a maximum passenger capacity of 1,905 with a total of 654 cabins, varying from suites with balconies to standard inside and outside cabins. The ratio of outside cabins will be 67 percent. She is powered by four GMT-Sulzer 8ZAL 40S main diesel engines, rated at 4 x 5,300 kw. She will also have four GMT A-320.12 diesel generator sets, rated at 4 x 3,660 kw.

Built at a cost of 365 billion lire (about \$316.5 million), delivery of the vessel is scheduled for only nine months after launching, as a result of the innovative integrated design, construction and outfitting system



The GMT-Sulzer-powered Costa Classica in dock at the Marghera, Venice, yard of Fincantieri.



developed by Fincantieri which allows for a remarkable degree of flexibility combined with a high-quality construction and finish. The Marghera, Venice, yard's accurate planning of all steps of the actual building process resulted in what has been regarded as the fastest construction performed in recent years for this type of vessel.

State-of-the-art technology and Computer Aided Design have optimized working procedures and made it possible to pre-assemble the ship in blocks away from the shipbuilding dock.

Eighty sections of the 12-deck ship were fitted out with a large percentage of the auxiliary equipment and piping and then taken to the Fincantieri-Marghera yard, where they have been under assembly since May 1990.

Just prior to the delivery of the Costa Classica to Costa Crociere later this year, Fincantieri expects to lay the keel of the Statendam. She will be the first of three 55,000 grt cruise ships to be operated by Holland America Lines.

Costa Crociere Group, with the construction of the Costa Classica and her sister ship, Costa Romantica, which will be delivered in 1993, is adding a significant landmark of quality to the most important stage of its fleet renewal program that will enable the company to maintain its prominent position in the world cruise market.

For free literature detailing the shipbuilding and vessel repairing services of the Fincantieri shipbuilding group,

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For the name of your local Alden Marine Electronics dealer and a free brochure, call 1-508-366-8851 or send the coupon to Alden Electronics, 54 Washington St., Westborough, MA 01581.

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Maritime Reporter/Engineering News

**Thomas B. Crowley Jr.
Appointed Manager,
Red & White Fleet**



Thomas B. Crowley Jr.

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policy against China's takeover of Hong Kong in six-and-a-half years, a great many Hong Kong people have established residence in Canada in the last few years, especially in British Columbia.

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**Mideast-U.S. Lines Cut
Surcharges, Increase Rates**

The 8900 Lines, which serve routes between the U.S. and Middle East, recently announced that they would increase their freight rates for some commodities, while cutting insurance and fuel surcharges for all cargoes.

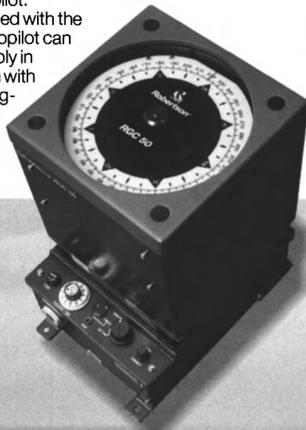
The group of 8900 Lines, which includes Maersk Line, National Shipping Co. of Saudi Arabia, Sea-

Land Service, Inc., United Arab Shipping Co., and Waterman Steamship Corp., said the increase would affect such goods as air conditioners, refrigerators, carpeting, clothing, textiles, poultry and breakfast cereal.

The increases will be implemented by raising the base rate for some products and eliminating discounts for others. Some of the increases are in effect, while others will begin June 1.

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Tanker Owners Alter Practices To Cope With Risks Under Pollution Act

Greater risks under the 1990 Oil Pollution Act are being managed by oil tanker owners by refusing to carry heavy crude to the U.S. and by reducing the number of other U.S. destinations. Owners are also paying

higher insurance rates.

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Because of the law, protection and indemnity clubs, the primary insurers of most tankers, began assessing their shipping members a surcharge in February for U.S.-

bound oil cargoes. The added insurance costs will probably be passed on to cargo owners eventually.

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NKK And Mitsubishi Clinch Saudi Arabia VLCC Deal

The long-awaited Saudi Arabian VLCC deal has been clinched by the Japanese shipbuilding industry.

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South Korean Carrier Cho Yang To Order Two Containerships

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The vessels, to be ordered in the first half of this year, will be ready for delivery in the first half of 1993.

Six ships were deployed by Cho Yang in the 24-vessel fleet when the Tricon service started on January 1 of this year. The three carriers intend to place between 33 and 35 vessels on the route by the end of 1993.

American Cyanamid Offers New Cyalume S.O.S. Light

Housed in its own sturdy, plastic casing, American Cyanamid Company's revolutionary new Cyalume® light has the versatility of providing the latest in survival-at-sea technology.

The Cyalume S.O.S. light can be swung in the air for greater visibility with the 30-inch lanyard; hung around the neck, leaving hands free; or used as a signal/beacon with casing acting as a handle/wand.

This eight-hour 360-degree signal light (signal can be seen for up to one nautical mile) is ideal for safety-at-sea or search-and-rescue emergency situations. Rugged, durable and designed to weather the roughest seas, the Cyalume S.O.S. light is also ideal for inclusion in lifeboats.

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Appointed Manager,
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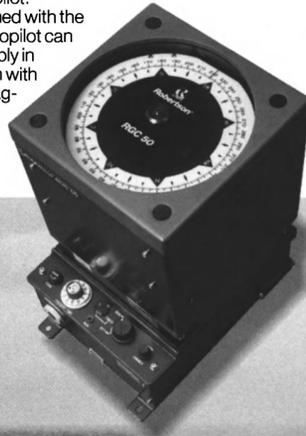
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BOATS & BARGES

Gladding-Hearn Building Detroit Diesel-Powered Catamaran For California Ferry Market

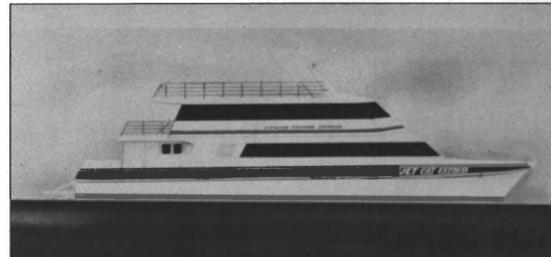
Gladding-Hearn Shipbuilding, The Duclos Corp., has begun building an Incat-designed catamaran for a southern California operator. Beginning in May, Catalina Channel Express will provide excursion and commuter service aboard the 102-foot Jet Cat Express from its home

base of San Pedro, Calif., to Avalon on Catalina Island. The 368-passenger, all-aluminum catamaran is expected to make the 26-nautical-mile run in a fast-running time of about 52 minutes.

The new vessel, the company's first to be built on the East Coast, will join a fleet of five monohulls running daily from Long Beach, Redondo Beach and San Pedro to the island resort.

Gladding-Hearn first entered the high-speed catamaran market in 1984, with delivery of the 350-passenger Makinac Express for Arnold Transit Co. on the Great Lakes. The Jet Cat Express is the Massachusetts shipyard's seventh Incat.

The vessel is powered by a pair of Detroit Diesel 16V149TAs rated at 1,740 hp, each turning at 1,800 rpm, and driven by twin KaMeWa water jets. By using waterjets instead of conventional propellers, draft was kept to only three feet, and a minimal wake is produced at all speeds, Gladding-Hearn president George



Artist's rendition of the new 103-foot, 368-passenger Jet Cat Express, International Catamaran being built by Gladding-Hearn Shipbuilding, Somerset, Mass., for Catalina Channel Express, San Pedro, Calif.

Duclos said. Hydraulically actuated, adjustable trim tabs, designed and built by the shipyard, further reduce the wake by adjusting for load at lower speeds.

The triple-deck vessel features upholstered seats, television, commercial heat and air-cooled air-conditioning and a snack bar in each cabin. Aircraft-type overhead luggage compartments are fitted inside

the perimeter of the cabins. The standard handrail around the fore-deck has been replaced with raised bulwarks, which feature built-in lockers for scuba gear.

For free literature detailing the facilities and capabilities of Gladding-Hearn Shipbuilding,

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Compass	Richie
Loud hailer	Raytheon
Refrigerators	Norcold
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China Delivers 1st LPG Tanker

The Jiangnan yard of China State Shipbuilding Corporation (CSSC) of the People's Republic of China recently delivered the country's first domestic-built LPG tanker. Previously, these highly sophisticated

vessels were built abroad.

The Chinese tanker is 293 feet long and 48 feet in beam with a cargo capacity of 106,000 cubic feet of LPG. Her tanks are constructed of high-strength, close-grained manganese steel carbide.

The shipyard is constructing a second LPG tanker for export to an unidentified German owner.

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SPD Technologies Names Colangelo Executive VP

Larry A. Colangelo has been elected to the new position of executive vice president and chief operating officer at SPD Technologies. In his new position, Mr. Colangelo will be responsible for directing all manufacturing, quality assurance, engineering and research-and-

development functions for SPD Technologies and SPD Switchgear. He will also direct the operations of SPD's subsidiary companies, Henschel Inc., and PacOrd Inc., and will retain responsibilities as chief financial officer of the parent company, reporting to George M. Gordon, president and chief executive officer.

Mr. Colangelo has been on the executive staff of SPD Technologies

since its formation in 1987 as a result of a management buyout of the former Gould Inc. Systems Protection Division. He had been on the Gould Inc. management staff since 1979, and prior to that held a succession of financial and manufacturing management positions with Rockwell International and RCA's Government Communication Systems Division. SPD Technologies is one of the



Larry A. Colangelo

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nation's largest producers of military circuit breakers and switchgear, and a leader in the development and manufacture of high-reliability shipboard systems as well as ship overhaul and repair services. Headquartered in Philadelphia, the company has operations across the nation and serves military markets worldwide.

Double Hulls Best For Preventing Oil Spills Academy Of Sciences Says

A National Academy of Sciences study titled "Tanker Spills: Prevention by Design," endorses double hulls for tankers as the best and most cost-effective current design for oil spill prevention.

However, double hulls, which place two barriers separated by a space two or three meters wide between the cargo and the ocean, are only a partial solution to preventing oil spills, the study said.

After looking at 17 alternative designs, the National Research Council "did not identify any design as superior to the double hull for all accident scenarios." The study continued, "The double hull is among the best values."

Double hulls will save about 3,000 to 5,000 tons of oil spillage a year in U.S. waters from collisions and groundings, roughly half the current average spilled from vessels, according to the study. The additional transportation cost would be about \$700 million a year, "or on the order of 1 cent per gallon transported."

In conclusion, the study recommended a major research program to improve tanker design that would dovetail with International Maritime Organization and foreign research efforts.

Frank Nichols

Frank Nichols, who founded what is now the Nichols Brothers Boat Builders, Inc., on Whidbey Island, Washington, passed away very late in 1990. Matt and Archie Nichols, brothers who run the yard, said that their father, 75, had died as the result of a heart attack.

The elder Mr. Nichols is survived by his second wife, Betty, and a family of seven boys and four girls including Matt and Archie. A fourth generation of Nichols is already at work in the yard, president of the yard Matt Nichols said.

Although ostensibly retired, the elder Mr. Nichols remained at work at the shipyard as a consultant and designer up to the time of his death.

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**Stolt-Nielsen Names
White Managing Director,
Tanker Trading-Europe**



Stephen Harwood White

Christopher J. Wright, president of Stolt-Nielsen Inc., has announced the promotion of **Stephen Harwood White** to the position of managing director, tanker trading-Europe. In his new capacity, Mr. White will be headquartered in London, England, directing the company's European tanker business.

Mr. White, has been with Stolt-Nielsen since 1972, after serving in Vietnam with the U.S. Navy as engineering officer on the 4,000-ton destroyer USS Hull, has held several key positions with the company. Starting as a ship operator, he then became operations manager, Stolt-Nielsen Singapore for three years, graduating to vice president and service manager, Latin American Service in 1987.

The Great Lakes service and trans-Atlantic services were added to his duties in 1987, and in 1989 he was appointed senior vice president, with responsibility for managing the company's tanker business in the Atlantic and South American areas.

Stolt Tankers and Terminals (Holdings) S.A. is an international transportation company specializing in the distribution of bulk liquids, both by land and sea. The company operates worldwide, with 21 offices in 12 countries.

**Delaval Turbine Division
Appoints Kramer, Morgan
To Marketing Department**

Robert F. Kramer and **Christopher S. Morgan** recently joined the marketing department of Delaval Turbine Division of Imo Industries Inc., it was announced by **Bern E. Deichmann**, manager, commercial operations.

Mr. Kramer, marketing manager, will be responsible for managing the sale of the new unit and revamp activities for the process, oil and gas, utility, power generation and marine marketplaces. He has an extensive background in product and business planning and served as head of development with a cogeneration plant developer as well as several years with Laramore Douglas Popham, a New York engineering consulting firm.

April, 1991

Mr. Morgan will support activities for gas turbine-driven compressor applications, as well as the division's international activities. He has 20 years' experience with Dresser Industries, Olean, N.Y., in applications for both centrifugal and reciprocating compressors, test engineering, project management and market planning. Most recently, he was responsible for gas turbine compressor marketing with Sulzer Turbosystems, Latham, N.Y.

**Steamship Association
In New Orleans Elects
1991 Officers**

The New Orleans Steamship Association recently elected **H. Kingsley Baker Jr.** chairman of the board of directors. Mr. Baker, who is senior vice president of Ryan-Walsh Inc., succeeds **Ralph Rugan Jr.**, who recently retired from Biehl & Co. Inc.

Joseph Harper, senior vice president of Gulf operations at I.T.O. Corp., was elected vice chairman, and **Roy Gonzalez**, assistant vice president and eastern Gulf general manager at Kerr Steamship Co., was elected treasurer.

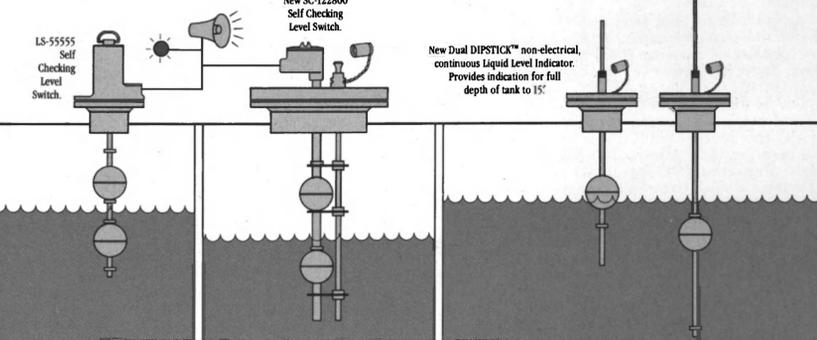
Reelected for 1991 were staff officers **C. David Burns**, president; **Channing Hayden Jr.**, vice president; **Carroll Miller**, vice president of administration; and **Rose Doles**, secretary.

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Best Effort Response To Cleaning Up Oil Spills

Marine Spill Response Corp. Projects
5-Year, \$800 Million Program

By John D. Costello, President, MSRC

Two years ago, on a reef in Alaska's Prince William Sound, the oil tanker Exxon Valdez ran aground causing America's biggest oil spill. While thousands worked to clean up the spill in Alaska, in Washington, a task force representing America's oil industry, set about studying the existing resources across the nation for responding to catastrophic oil spills.

As a result of task force recommendations, 20 oil companies began the process of creating the Petroleum Industry Response Organization (PIRO) to manage catastrophic spills. In August 1990, the oil companies created two new organizations: the Marine Spill Response Corporation (MSRC) and the Marine Preservation Association (MPA). MSRC, which has succeeded PIRO, is an independent oil spill response organization.

MSRC will operate from five Regional Response Centers, each supported by several strategically placed equipment sites along the coast, and will become the nation's largest spill response and cleanup organization. MPA, an organization comprised of oil companies and the shippers and receivers of oil, will fund MSRC but have no control over operations.

MSRC is headquartered in Washington, D.C., with our five regional response centers located along the coastal United States in the New York/New Jersey area, south Florida in Miami/Port Everglades area, the Lake Charles/Hackberry, Louisiana area in the Gulf, Port Hueneme, California in the Southwest, and the Seattle, Washington area in the Northwest.

Each region will have four to six prestaging areas (22 in all) where equipment, supplies and sometimes vessels and personnel will be located. Each site has been selected to enable a quicker response to a large spill in areas of greater oil movements, and hence risk, along the coast.

MSRC, under the direction of the Coast Guard, will provide a "best effort" response to cleaning up spills of persistent (crude) oils that are beyond the capacity of local response organizations. Each of five regional centers is designed to provide this "best effort" response to spills. MSRC's response capabilities are being designed based on a spill roughly the size of the Alaska spill. Operationally, the nearest equip-

ment/resources will be brought to the scene. In the event of an even larger spill, some of the resources of two or more regions may be combined.

MSRC's five-year costs for operations, capital equipment, and research and development are estimated at more than \$800 million. These costs are funded through MPA members' annual dues, which will be based on the number of barrels of oil transported in the previous year. In the event an MPA member becomes a spiller, MSRC will be available to aid the spiller, consistent with its agreement with the Coast Guard. The spiller—not MPA or MSRC—will pay for the actual cleanup.

Although MSRC is a private organization that will work closely under contract with a spiller, it will also work closely with government efforts. MSRC will be available to execute the appropriate portions of the spiller's response plan. Under the Oil Pollution Act, spillers must respond under the direction of the Coast Guard during major oil spills in coastal areas. The presence of the Coast Guard at a spill site does not relieve spillers of their responsibilities for funding the clean up. The Coast Guard must, however, provide clear direction and coordination of cleanup operations when spills or potential spills pose a substantial threat to the public health and safety.

MSRC is not intended to replace existing oil spill cooperatives and independent response contractors. In fact, MSRC will use co-ops and independent responders as subcontractors for major spills and will train and drill with them. These existing entities have done a good job handling smaller spills. MSRC will only act when this infrastructure does not have sufficient resources for larger spills.

Under federal law, the responder to an oil spill has limited immunity. He is not liable for removal costs or damages unless he acts with gross negligence or willful misconduct. This limited immunity does not involve cases of personal injury or wrongful death. Under some state laws, however, the responder is not provided this limited immunity. MSRC is seeking state liability standards that are the same as the federal standard. This standard is appropriate because an oil spill re-

sponder must act decisively in a dynamic environment. Moreover, responders frequently must act with less than perfect information.

Another unique aspect of MSRC will be administration of a research and development program to improve the technology and knowledge used to respond to and clean up spills. This program will complement others in government, academia, and industry. MSRC plans to study such subjects as prevention of oil loss from damaged ships, on-water oil recovery and treatment, prevention and mitigation of shoreline impacts, fate and effects of spilled oil and petroleum products, mitigation of adverse effects on wildlife, and health and safety. MSRC will also aim to develop standards of oil spill response equipment, techniques and training.

MSRC plans to be fully operational by February 1993—the date when the Oil Pollution Act requires owners and operators of vessels, terminals, pipelines and offshore platforms to submit comprehensive spill response plans. Much must be done in the intervening two years.

A detailed implementation plan has been developed for MSRC, with most of the plan still in the process of being implemented. Equipment and vessels are being procured. Regional Response Centers must be surveyed and acquired. Land and buildings are being purchased or leased. Personnel—including hundreds of subcontractors—must be hired, trained and integrated into MSRC operations. Insurance must be arranged, and the research and readiness programs must be launched.

The Oil Pollution Act of 1990 requires that shippers and others responsible for oil transported on offshore and tidal waters show they can, to the maximum extent practicable, remove a "worst case" spill they might cause. This capability must reside in the private sector, and many companies may want to rely on MSRC to meet important federal response requirements, rather than obtain other response and cleanup capabilities.

About the Author: Vice Adm. John D. Costello, USCG (Ret.), was appointed MSRC's president in September 1990. He is a 36-year veteran of the U.S. Coast Guard.

Zodiac Constructing 21-Foot RHI Patrol Model —Literature Available



The self-righting system of Zodiac/Hurricane's RHI will enable the vessel to negotiate heavy surf and sea conditions.

Zodiac/Hurricane, one of the largest manufacturers of rigid-hulled inflatables (RHIs), has begun construction of a 21-foot patrol model for delivery to BVI customs in Tortola.

The vessel, which is powered with twin 70-hp motors, will be used offshore in law enforcement activities. The inflatable collar surrounding the fiberglass hull will facilitate underway boardings and recoveries at sea.

The self-righting system will enable the vessel to negotiate heavy surf and sea conditions.

For more information and free literature,

Circle 60 on Reader Service Card

Severe Vessel Shortage, Advanced Age Of Fleet Threaten Some USSR Lines

According to a report by the Soviet Ministry of Merchant Marine, a chronic inability to order new ships may lead to financial losses for Soviet shipping companies and to lack of competitiveness in the world maritime market.

The semi-official newspaper Water Transport reported that the severe shortage and advanced age of vessels, averaging more than 15 years which renders them increasingly less acceptable on the international freight market, could force some Soviet shipping companies to shut down in five to six years.

One company singled out as in danger of shutting down by 1994 was Kamchatka Shipping Co. A total of 28 of the company's 51 merchant vessels are scheduled to be scrapped shortly, but only seven of the 28 will be replaced.

Some 170,000 tons of vital supplies needed by the Kamchatka region at the eastern edge of the Soviet Union won't be shipped there this year because of lack of vessels, according to official estimates. These shortages are forecast to reach as high as 1.5 million tons a year by 1995.

If Kamchatka Shipping Co. closes its doors, the ministry is reported as saying other companies could take its place. However, the companies are said to have turned down the suggestion as they, too, have a severe shortage of ships available, and many are unfit for service in icy northern waters.

**Schepen Appointed VP,
Central America/Panama
Service For Crowley**



Rinus Schepen

Rinus Schepen has been appointed vice president, Central America and Panama Service, for Crowley Maritime Corporation's Atlantic Division. He reports to Miguel A. Rossy, senior vice president-Crowley Caribbean Transport (CCT) Services.

In his new position, Mr. Schepen, who is now headquartered in Miami, is responsible for foreign locations in an area that includes Costa Rica, Guatemala, Honduras, Nicaragua, El Salvador, and Panama.

Mr. Schepen, who joined Crowley in 1987, was until his new appointment, vice president for European Services headquartered in Jacksonville, Fla. He has also held senior positions for Crowley in New Jersey and in the Netherlands (Rotterdam).

Mr. Schepen, a native of the Netherlands, worked for over 20 years in various aspects of the shipping and transportation industry. His broad international experience includes assignments in the U.K., Luxembourg, Germany, the Netherlands and the U.S.

The Atlantic Division of Crowley Maritime Corporation, with principal offices in Jacksonville, Fla., includes the services provided by Crowley Caribbean Transport, American Transport Lines, Trailer Marine Transport and Crowley Towing and Transportation. California-based Crowley Maritime provides ocean and related transportation services around the globe.

**Leslie Acquires Bailey
Division, CMB Industries'
Navy/Marine Product Lines**

Leslie Controls, Inc. of Tampa, Fla., recently announced that it had acquired all of the Navy and marine product lines previously manufactured by the Bailey Division of CMB Industries of Fresno, Calif.

Leslie has been a quality manufacturer of Navy and marine equipment for 95 years, and currently manufactures a broad and complete line of control valves, steam reducing valves, pressure and temperature controls, steam water heaters, whistles, and pneumatic and electric instrumentation.

The newly acquired product lines will be manufactured in Leslie's Tampa, Fla., headquarters and manufacturing facility, and their

addition will make Leslie's line of Navy and marine fluid control equipment one of the most comprehensive in the industry. The new Leslie products will include water reducing valves, air reducing valves, duplex strainers, "Y" strainers, pressure relief valves, and magazine sprinkler valves.

For additional information and free literature,

Circle 14 on Reader Service Card

**Coastal Corporation
Reactivates Two OBOs**

Two coal-fired ore/bulk/oil (OBO) carriers which have been in lay-up since 1985 are being reactivated by the Coastal Corporation of Houston, Texas, and sent to Keppel Shipyard in Singapore for repair prior to reentering service.

The two vessels, 129,017-dwt Jade Phoenix and her sister ship

Golden Phoenix, built by Avondale Shipyard in Louisiana in 1976, will each spend at least 40 days in the Singapore shipyard prior to becoming available for charter.

No changes to the propulsion system are involved in the reactivation operation.

Coastal Corporation, which took over ownership of both vessels during the latter part of last year, has not decided in which service the ships will be utilized.

The Power Behind the Power



This artist's impression portrays the vital electrical systems and circuitry on which the ship's mission depends.

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The 844-foot-long multipurpose amphibious assault ship USS Essex (LHD-2), launched in January of this year, was recently christened at Ingalls Shipbuilding division of Litton Industries in Pascagoula, Miss.

Ingalls Christens USS Essex, Second Wasp Class Assault Ship

The second ship in the new Wasp Class (LHD-1) of multipurpose amphibious assault ships for the U.S. Navy was recently christened "Essex" at Ingalls Shipbuilding division of Litton in Pascagoula, Miss.

The principal speaker at the ceremony was Secretary of Defense **Richard Cheney**. His wife, Mrs. **Lynne Cheney**, was chosen by the

Navy as the Essex's sponsor and broke the traditional bottle of champagne across the ship's bow.

Other speakers at the ceremony included U.S. Senator **Trent Lott** of Mississippi; Secretary of the Navy, **H. Lawrence Garrett III**; Adm. **Frank B. Kelso**, Chief of Naval Operations; **Orion L. Hoch**, chairman and chief executive officer

of Litton and **Jerry St. Pe**, president of Ingalls Shipbuilding and senior vice president of Litton.

The 40,500-ton, 844-foot ship is the centerpiece of a Navy amphibious group. Its primary mission is the embarkation, deployment, command and support of a marine landing force by air and amphibious craft. Secondary missions include operating with a carrier or battleship battlegroup, providing aircraft and command/control facilities for sea control missions.

The Essex (LHD-2), as well as other ships of the Wasp Class, are specially designed to accommodate Landing Craft, Air Cushion (LCAC) vehicles, Harrier II and Short Take Off/Vertical Landing jets. The Essex can also accommodate a full range of Navy and Marine Corps helicopters, conventional landing craft and amphibious vehicles.

With an overall length of 844 feet (788 feet at the waterline) and beam of 106 feet, the Essex features two Westinghouse steam propulsion turbines, developing a combined 70,000 horsepower, which drive the ship to speeds in excess of 20 knots.

Various other equipment suppliers for the Essex include: Litton Guidance & Control Systems division (ship control consoles); Combustion Engineering (boilers); General Electric Co. (generators); Jered Brown Brothers (elevators and steering gears); Litton Data Systems division (electronic equip-

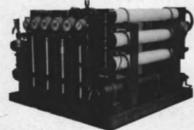
ment); National Forge Co. (propulsion shafting); Bird-Johnson (propellers); and Stewart & Stevenson Services (diesel generators).

For free literature detailing the shipbuilding facilities of Ingalls Shipbuilding division of Litton,

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ESSEX Equipment List	
Steam turbines & reduction gears	Westinghouse Electric
Propulsion shafting	National Forge
Generators	Stewart & Stevenson
Steering controls	Sperry Marine
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Generators	GE
Pumps	Warren Pumps
Elevators & steering gear	Jered Brown Bros.
Electronic equipment	Litton Data
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Anchor & chains	Baldt
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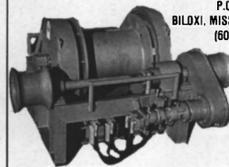
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Maritime Reporter/Engineering News

Donald W. Jett Named President, CDI Marine



Donald W. Jett

Donald W. Jett has been named president of CDI Marine Company, Jacksonville, Fla., replacing Paul I. Beining who retired.

Mr. Jett has served as executive vice president for the past eight years. He joined CDI Marine in 1974 after working with Newport News Shipbuilding for eight years.

As president, Mr. Jett will serve as CEO for the Jacksonville-based company. Reporting to him are engineering/design offices located in Jacksonville, Norfolk, Philadelphia, Seattle, and San Diego.

CDI Marine Company, one of the nation's largest naval architecture and marine engineering firms serving the U.S. Navy through both public and private shipyards, is a subsidiary of CDI Corporation of Philadelphia, Pa.

Symposium To Focus On St. Lawrence River As Key Maritime Corridor

The St. Lawrence Economic Council and the St. Lawrence Development Secretariat have organized a symposium, "Saint-Laurent: Horizon 2000," to be held June 12-14 in Quebec City, Canada.

Industry executives will discuss the challenges facing the St. Lawrence River as a key maritime corridor in North America. Speakers will include Robert Bourassa, premier of Quebec.

The symposium will look into global economic and trade trends, as well as marine transport and port developments.

Western Coal Shipments Through Great Lakes Ports Could Expand Dramatically

To comply with pollution restrictions that go into effect in 1995, several electric utilities and industrial power plants along the Great Lakes are considering using low-sulfur Western coal, which would mean a big surge of business on the Great Lakes.

Fred Shusterich, general manager of Midwest Energy Resources Co., a Superior, Wis., terminal operator that handles most of the Western coal shipped on the Great Lakes, said: "We believe we could

have about a 50 percent increase in business in the next few years."

Midwest Energy Resources is drafting engineering plans to expand its terminal from its present yearly capacity of 12 million tons to 18 million tons.

Other ports and terminals around the Great Lakes are also studying moves that would enable them to capitalize on the anticipated boom in Western coal usage.

U.S.-Flag ULCC To Be Reactivated After 10-Year Lay-Up

The U.S.-flag 398,000-dwt tanker UST Pacific is scheduled for reactivation work after 10 years in lay up.

The UST Pacific is at Malaysian Shipbuilding & Engineering for

reactivation work and is scheduled to enter service later this year. The Ultra Large Crude Carrier (ULCC) and her sister, the UST Atlantic, owned by Interocean Maritime and under long-term charter to Shell, were built in 1979-80 by Newport News Shipbuilding.

No plans have been announced for the reactivation of the UST Atlantic, which has also been laid up since 1981.

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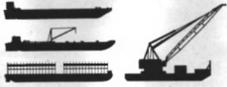
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Circle 254 on Reader Service Card

Norwegian Navy To Build Nine MCMVs With Composite Hulls



Artist's conception of the new combination hovercraft/catamaran being constructed of composite materials for the Norwegian Navy.

Barracuda Technologies, Laholm, Sweden, has been awarded a comprehensive contract by Kvaerner Batservice a.s., Norway, to supply the cellular core material and syntactic filler system for nine new mine countermeasure hovercraft/catamaran vessels (MCMVs) ordered by the Norwegian Navy.

The contract, valued at SEK 50,000,000 (about \$9,000,000), covers the supply of Divinycell cellular core material and Divilette syntactic filler systems to be used in the hulls and superstructures for the new type of combination hovercraft/catamarans.

These MCMVs, over 164 feet long, are an entirely new combination of hovercraft and catamaran constructed of composite materials. This type of vessel, said to be the first of its kind in the world, is built using a sandwich construction technique in which a core of Divinycell is laminated on both sides with reinforced polyesters (glass fiber).

The choice of materials provides the vessel with unique characteristics. Divinycell Sandwich combines great strength with low weight, and the technique provides an extremely advantageous ratio between mechanical properties and material fatigue, as well as unparalleled resistance to the heavy shock loads associated with mine detonation.

Delivery date for the first MCMVs is 1992, and the entire series should be afloat by the mid-90s.

Divinycell, a cross-linked, expanded structural cellular polymer, is the heart of a system of materials and services included in Barracuda Technologies' investment in advanced composite materials. This system encompasses many qualities and densities of structural cellular polymers for various applications, from large submarine constructions operating at a depth of 1,000 meters to civilian and military vessels.

For further information from Barracuda Technologies,

Circle 19 on Reader Service Card

Del Monte's Credit Working Line Reinstated By Bank Consortium

PPI Del Monte Tropical Fruit Company's \$75 million credit working line has been reinstated by a 23-bank consortium headed by Credit Suisse.

In wake of problems suffered by parent company Polly Peck International, the line of credit supplied to the Florida-based firm had been frozen.

Brian Haycox, PPI Del Monte chief executive, said: "This move signifies the confidence the banks have in the long-term performance of this firm. Our trading profits are strong and our core operations are performing extremely well."

Maritime Reporter/Engineering News

**Tore Steen Appointed
President And CEO,
West State, Inc.**



Tore Steen

West State, Inc. (WSI) recently announced that **Tore Steen** has been appointed president and chief executive officer. Mr. Steen will assume the role from **Doug Watson**, owner of WSI, who will become chairman. WSI is one of three major marine repair companies in Portland, Ore.

Mr. Steen has a diversified and international background and achievements in founding and building organizations as well as in managing public and private companies. He was president of Flexi-Van Leasing Corporation, one of the world's largest lessors and operators of shipping containers and chassis, and president of Chemco International and NMR of American, and executive vice president of WTD Industries.

West State, Inc. was founded in 1986 and operates its ship repair facilities on the premises of the Port of Portland. Clients include all of the major oil shipping companies operating on the West Coast, including Chevron, Exxon and Texaco, as well as the Military Sealift Command, the Maritime Administration, the Corps of Engineers and the U.S. Coast Guard.

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Literature Available**

PBM, Inc., Irwin, Pa., has designed a patented flush tank valve virtually eliminating the pocket area normally found between tank bottoms and other valves that directly mount to tanks and vessels. PBM also has a patented Adjust-O-Seal design that allows in-line adjustment of the valve seats.

According to PBM, this design is great for vacuum service. It provides a seal on the upper seat in addition to the bottom seat. The design does not rely on downward pressure to create the seal. The PBM flush tank valve is designed to meet AMSE code for pressure vessels. The FT valve can also be fitted with body taps, allowing it to be steam purged "on-line," making it ideal for aseptic applications.

PBM can custom machine mounting flanges to adapt the valve to other manufacturers weld pads and still keep pocket area to a mini-

mum.

These valves are available in fractional sizes to 8 inches, SST, carbon steel, alloy 20, Hastelloy and other metals. All valves are precision machined and polished to exact surface finishes. Easily actuated. Bolt-on style pads are also available.

For more information and free literature,

Circle 33 on Reader Service Card

**SCA May Support
Sanctions Against
Foreign Subsidized Yards**

The U.S. shipbuilding industry, annoyed at the lack of progress in the multilateral trade negotiations, will support Congressional legislation which would levy sanctions on foreign countries which subsidize

their shipbuilding industries.

According to **John Stocker**, president of the Shipbuilders Council of America, a national association which represents the interests of the U.S. shipbuilding industry, the longer the negotiations take, the more the competitiveness of U.S. shipyards in the commercial market suffers because of subsidized foreign yards.

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- 2 - Mo. 3198, Caterpillar hydraulic clutches with 3.95:1 gear ratio driving four blade propellers
- 2 - 300 KW, 110/408 V AC generators driven by keel cooled, Mo. 353 Caterpillar diesel engines
- 2 - Two stage, Gardner-Denver, air compressors and tanks
- 1 - 3" Aurora bilge pump, 3" Aurora fire pump, 3" FO transfer pump
- 2 - 1" Deming FW pumps and system
- 1 - 4" Ammonia compressor cooling water pump
- 1 - 1-1/4" SW wash down pump

There are approximately 1400 wood lath traps on the vessel with 30 miles of 9/16" polypropylene rope with floats, etc. necessary for the operation of the traps.

There is a material lift from the ice hold to the processing room that is electrical operated.

There is a hydraulic crane on the second deck for lifting stores, catch boats, etc.

There are ten (10) hydraulic fishing reels on the main deck.

On the second deck of the vessel there is a processing room certified by the U.S.D.A. (composition covering).

The vessel is renovated with a total of 11,000 cu. ft. of below freezing, cargo hold with a plate freezer that has an estimated capacity of 1500# of frozen product per three (3) hours of operation

There are ammonia compressors on the vessel with 100% redundancy for the protection of the frozen product, and 6" of insulation through out the refrigerated spaces.

There are packaging machines, conveyors, stainless steel work tables, sinks, etc. for processing the product.

On the second deck port side there is a laboratory, to be used in the quality control of the product.

This vessel has an appraised value of \$2,450,000.

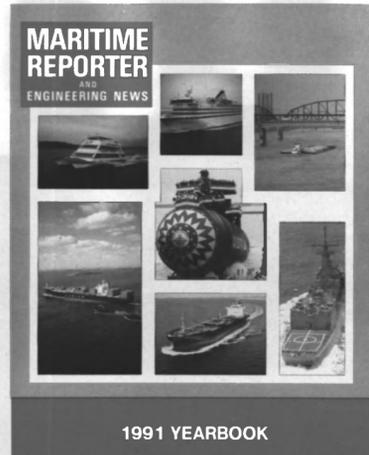
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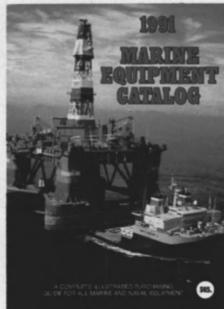
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**New \$40 Million NSF
Research Ship Fitted
With Thordon Bearings**

The R/V Nathaniel B. Palmer, owned by Edison Chouest Offshore, has been custom designed for the Antarctic research activities of the National Science Foundation. Engineered by a firm in Vancouver, and

being built in Louisiana, the vessel incorporates both Thordon bearings and a water soluble Thor-Lube lubrication system.

"This is a highly specialized ship that can accurately be described as state-of-the-art," said **Thomas Forhand**, Head, Antarctic Staff, Division of Polar Programs, National Science Foundation (NSF), Washington, D.C. "We needed a vessel designed to do research—a

pure research vessel in which every inch supports research activities. Further, it also has to operate in the environmentally fragile Antarctic, which is another reason why we needed a vessel that is not only specifically designed to meet our research requirements, but incorporates the best available technology to prevent environmental damage," said Mr. Forhand.

Hull construction of the \$40 mil-

lion vessel began at North American Shipbuilding, an Edison Chouest subsidiary in LaRose, La., in April 1990, concurrent with the availability of design drawings, according to Vancouver-based **John van der Pass**, partner and engineering manager, Polar Design Consultants. The 6,500-ton vessel is 308.5 feet long by 60 feet wide and will be used by the NSF for oceanographic, geophysical and geological research in the Antarctic.

Scheduled for completion shortly, the hull will be launched upside down and then righted by heavy cranes, according to Mr. van der Pass.

"While the Antarctic is considered an environmentally sensitive area," said Mr. van der Pass, "vessels operating there are subjected to intense pressure and pounding by ice. And the most vulnerable area to this level of pounding is the propeller shaft/stern tube."

Combined with thin-walled Thordon XL bearings manufactured by Burlington, Ontario-based Thordon Bearings Inc., the Thor-Lube system provides high tolerance to the shock loads and misalignment which can result from ice pressure and pounding.

"... in the event of seal failure," continued Mr. van der Pass, "there wouldn't be any environmental damage and the ship could continue to function, even at full speed, using a water back-up system until it reached port. Thor-Lube was specified for these reasons."

The foundation will lease the vessel for 10 years from Edison Chouest Offshore, Galliano, La.

"To us, it's just another specialized ship," said **Laney Chouest**, Edison Chouest vice president. "And like other specialized ship projects, we looked for the best people for the design component and assistance in selecting equipment that best met design and client needs," he added.

For free literature on Thordon bearings and water-soluble Thor-Lube lubrication system,

Circle 66 on Reader Service Card

For additional information on the shipbuilding capabilities of North American Shipbuilding,

Circle 67 on Reader Service Card

**Haskew Joins Blutworth
As Manager And VP
At Corpus Christi**

Stephen R. Haskew has joined Jay Blutworth Inc. as vice president and general manager at the company's Corpus Christi, Texas, location.

Mr. Haskew comes to Blutworth with 18 years of experience, having been associated with Newpark Shipbuilding in Houston and the former National Marine Service, Inc. in Hartford, Ill.

Jay Blutworth Inc. offers complete shipyard repairs to the inland and offshore industry.

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**Sumitomo Awarded
Mobil Shipping Contract
For 280,000-Dwt Tanker**

A contract to build a 280,000-dwt crude oil tanker has been awarded Sumitomo Heavy Industries Ltd. in Japan by Mobil Shipping and Transportation Co., an affiliate of Mobil Corp.

The new vessel, which will be fitted with a double hull, will join Mobil's fleet of 40 tankers during the fourth quarter of 1993. Mobil also has an option for a second vessel to be delivered a year later.

For free literature on the facilities and capabilities of Sumitomo Heavy Industries,

Circle 88 on Reader Service Card

**Salisbury Named Manager,
Field Service, For IMO's
Delaval Turbine Division**

Roy J. Salisbury has joined the Delaval Turbine Division of Imo Industries Inc. as field service manager, it was announced by Bern E. Deichmann, commercial operations manager of the division. In his new capacity, Mr. Salisbury will be responsible for the organization, administration and supervision of all phases of the field service function.

Prior to joining IMO, Mr. Salisbury was employed by the Elliott Company for nearly 15 years in both Jeannette, Pa., and Houston, Texas. There, he held several service management positions, most recently as customer service and shop operations manager, Houston.

Delaval Turbine Division supplies engineered rotating machinery products, including centrifugal compressors, steam turbines and boiler feed pumps, and after market services to the utility, process, oil and gas, municipal, and marine industries.

**American Ship Building
Completes Series
Of Financing Agreements**

American Ship Building recently announced the completion of a series of financing agreements.

The company expects to be provided with needed cash and credit to meet present and projected financial requirements as a result of the accords with NCNB National Bank of Florida, Citibank NA of New York and George M. Steinbrenner, chairman of the board and chief executive officer of American Ship Building Co.

The agreements provide for \$10 million in financing and for up to \$28 million in additional credit commitments.

**Leevac Shipyards Delivers
First New Supply Vessel
Built In U.S. Since 1986**

Leevac Shipyards, Jennings, La., recently delivered the Cape Hatteras, the first new supply vessel to be

built in the U.S. since 1986, to Sea Mar Operators of Lafayette, La.

The vessel is 200 feet long with a beam of 40 feet and a normal draft of 15 feet, a size that enables it to operate in the deeper waters of the Gulf of Mexico.

Classed by the American Bureau of Shipping for full ocean service, the Cape Hatteras has a gross tonnage of 872 tons. She has an installed power of 3,000 bhp from twin

EMD diesels of type 12-645-C.A Schottel bow thruster has been installed for improved maneuverability, driven by a 600 bhp 16F992NA Detroit Diesel engine. Two BV71 Detroit Diesel-powered generators of 125-kw output meet electrical requirements.

The vessel has crew quarters for 21, and attention has been paid to comfort, with a separate lounge area for TV viewing.

The Cape Hatteras has been placed on charter to the Western Company of North America, which has installed its own equipment on the after deck for geophysical survey work, with additional controls in the wheelhouse.

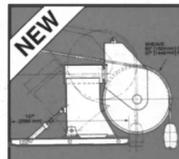
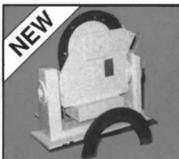
For free literature on the facilities and capabilities of Leevac Shipyards,

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Smith Berger offers more Seaworthy choices.

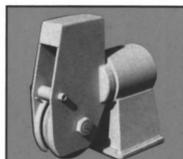
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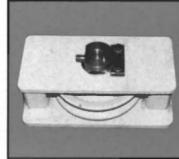


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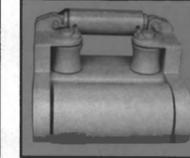
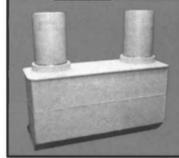
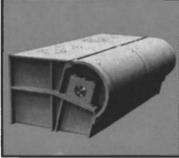


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**McDermott Marine Readies
Four-Pile Offshore Platform
For Freeport-McMoRan**

One of the world's tallest four-pile offshore platforms is being built for Freeport-McMoRan Oil & Gas Company, a subsidiary of Freeport-McMoRan Inc., in McDermott Marine Construction's Louisiana fabri-

cation yards. The platform, named Crystal, will extend 875 feet from the seafloor to the top of its drilling derrick and is scheduled to be installed during the summer in 621 feet of water off the coast of Louisiana in Mississippi Canyon Block 365 of the Gulf of Mexico.

The eight-well Crystal platform, designed by McDermott Engineering in New Orleans, is being built as

a fast-track project at McDermott's Louisiana fabrication yards in Amelia and New Iberia.

The platform's major components under construction in McDermott's yards include the 6,900-ton jacket, a 700-ton deck, piles weighing 1,500 tons and conductors weighing 575 tons.

Freeport-McMoRan Inc. is a leader in the exploration, mining,

development, production, processing, and marketing of natural resources. The company's products include sulphur, phosphate rock, phosphate fertilizers, oil and natural gas, copper, gold, silver, and other natural resources.

McDermott Marine Construction is a major operating unit of McDermott International, Inc., a leading worldwide energy services company.

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Avondale To Use Japanese Method Of Building —Gets Trade Zone Status

Avondale Industries of Louisiana, in a bid to increase its shipbuilding business, has decided to try utilizing the Japanese method of offering a choice of standard configurations to keep costs down compared with its usual custom-design approach for commercial vessels.

The firm at the same time has obtained foreign trade zone (FTZ) designation for four of its New Orleans-area yards to enhance its export products in the eyes of potential overseas customers. Bruce Hicks, Avondale controller/treasurer, said Avondale wants to try the Japanese marketing method of having a book with several standard configurations, each with a set price, which is much less expensive than designing ships for customers from the ground up, a method that is unattractive to customers these days.

The standard-configuration approach for products carriers and tankers in the 40,000-dwt class, with particular emphasis on U.S. Jones Act vessels destined for the coastwise trade, are what Avondale is most keen to utilize, Mr. Hicks said.

BIW Introduces Metal-Clad Instrument Cable For Oil Reservoir Management

BIW, manufacturer of engineered cable systems, now produces metal-clad instrument cable systems for severe downhole conditions in splice-free lengths of up to 20,000 feet. This unique technology helps meet specific reservoir management needs for the oil industry, including the need to permanently monitor well conditions and the need to install deep-set electric safety valves.

BIW's custom-designed metal-clad instrument cable systems reliably connect downhole instruments to surface data management systems. Tested in long-term permanent installations in the North Sea and throughout the world, BIW's improved cable lengths provide complete long-term isolation of electrical components from well fluids.

For more information about BIW's metal-clad instrument cable, Circle 51 on Reader Service Card

ELECTRONICS UPDATE

Trimble Navigation Introduces Integrated GPS Receiver And Antenna In One Unit

Trimble Navigation, Sunnyvale, Calif., has introduced another innovative GPS product: integrated GPS receiver and antenna in one unit.

The Acutis® GPS is a complete three-channel GPS (Global Positioning System) receiver and antenna, integrated into a rugged, weatherproof case that mounts like an antenna.

The Acutis uses the industry standard NMEA-0183 output so that it will interface with other plot-

ters, chart plotters and SatNavs, and can be installed within minutes. This versatility allows the Acutis to be moved from boat to boat. It is built around an advanced three-channel design that is capable of tracking up to eight satellites at once, even when subjected to severe acceleration.

The design guarantees more stable operation even under adverse receiving conditions and allows the Acutis to make very precise instantaneous velocity measurements. It

performs a new velocity calculation once a second and updates the display every five seconds.

The Acutis GPS is an economical way to upgrade to GPS navigation equipment without requiring installation of additional instruments or learning a new system.

Trimble is one of the world leaders in the emerging commercial market for satellite-based navigation and position data products using the U.S. Government-funded Global Positioning System (GPS). Trimble designs, manufactures, and markets electronic instruments and systems for determining precise geographic location. These products are sold in a variety of markets including survey and mapping, Geographic Information Systems (GIS), marine, aviation, vehicle tracking, military applications, and differential GPS systems. The company, founded in 1978 and located in the heart of Silicon Valley, Calif., has been selling GPS to the world market since 1984.

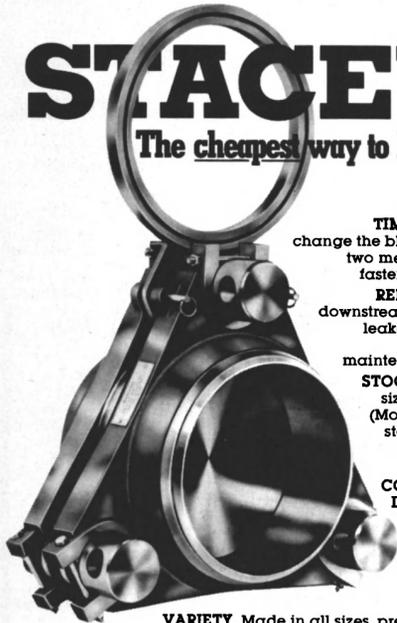


The Acutis GPS receiver and antenna is pictured with other marine navigation products from Trimble Navigation.

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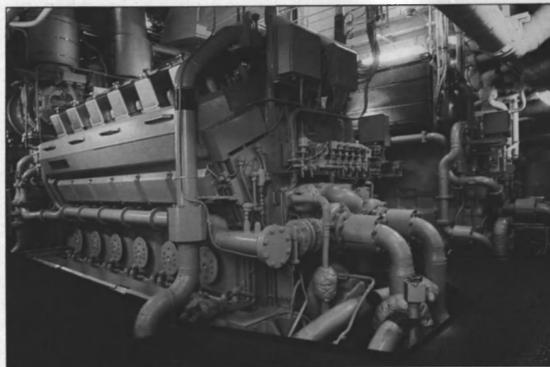


Circle 346 on Reader Service Card

87

PROPULSION UPDATE

Flexible Power Solutions*



A large father-and-son arrangement. Two shaftlines with one eight-cylinder and one 12-cylinder Wartsila Vasa 32 engine, totaling 22,200 bhp RCCL's Nordic Empress. The auxiliary machinery consists of the same type, three Wartsila Vasa 8R32 generating 10,320 kw.

On many vessel types the required propulsion power varies greatly during a single voyage. Remarkable differences in load, trim or cruising speed are the cause. Many shipowners have noted that conventional single-engine solutions do not provide the flexibility required for such wide fluctuations. The effects are even greater for ships where the original trial speed was far above the actual requirement. Trial speeds and thus the installed main engine outputs are purposely selected to be too high.

This is done to make the ship more interesting on the second-hand market, while the actual traffic where the vessel is used moves at much lower speeds.

Multi-engine solutions are often chosen for many ship types. This permits generation of propulsion power required in any operating mode at engine loadings close to the optimum fuel consumption loadings.

The most spectacular example is the passenger ferries, where the usual layout is two propeller shafts

and four main engines. There are also examples where as many as four engines are served by a single gearbox.

For a typical passenger ferry with a four-engine, twin-screw installation, the installed outputs can exceed 45,000 bhp. The reasons why passenger ship operators select multi-engine configurations are obvious: availability; flexibility; and compactness.

Another way to achieve flexibility is to install a diesel-electric solution, where the propulsion power comes from a common "power station." The power station normally consists of from two to even nine engines and since this power station feeds both the electrical equipment as well as the propulsion motors, it is easy to install an electronic performance control that starts and stops engines based on the actual power requirement. In this way, the engine loadings are always on or close to the optimum fuel consumption point.

A twin-engine installation would be normal for a single-screw vessel. In some cases the optimum is that both engines are the same size. In other cases, it is better to use a "father-and-son" installation, which is a machinery arrangement where the main propulsion is handled with a multi-engine arrangement consisting of a larger engine (father) and a smaller engine (son). The engines are connected to a common gearbox and drive a single controllable pitch propeller.

The father-and-son solution is usually very efficient for ships with a varying speed or loading profile. By selecting the sizes of main engines wisely and by installing suitable shaft generator arrangements, remarkable savings in both capital expenditure and operating costs can be achieved.



The Baltic Eider, a modern RO/RO vessel built in Korea for UBS, London. She and her sister vessel have a father-and-son arrangement with one six-cylinder and one eight-cylinder Wartsila Vasa 46 engine.

Further savings can be made when onboard electricity is generated with the main engines. Due to the CPP installation, the configuration does not require expensive constant speed gears for a shaft generator. The cost and complexity of such devices are normally much more than what would be anticipated in the initial stage.

In conclusion, the use of multi-engine installations has proven a useful alternative to conventional slow-speed engine installations. The flexibility needed to run at any speeds and loading conditions is highly appreciated by owners already using the system.

The availability of the system is increased, since the ship is maneuverable at all times, even if one of the main engines is being overhauled.

The economy of this system results not only from lower operating costs, but also from low capital expenditure and space savings.

For free literature on diesel engines from Wartsila,

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*Editor's Note—Excerpted from a paper by Kenneth J. Jofs, president, Wartsila Diesel do Brasil Ltda.

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Maritime Reporter/Engineering News

**Italian Owner Orders
Two Double-Skin Tankers
From Fincantieri**

Milan-based SNAM, operator of the Italian state-owned AGIP fleet, recently ordered two 155,000-dwt double-skinned crude carriers from Fincantieri Cantieri Navali Italiani. The contract includes options for two more tankers as well.

The two Suezmax size tankers will be built at Fincantieri's Venezia-Marghera yard and the ships are scheduled for delivery in 1994.

These will be the first newbuildings added to the SNAM fleet since 1987, when it took of the 112,000-ton AGIP Piemonte from Fincantieri.

**Flender Werft Set
To Build Two RO/ROs
For Grimaldi Group**

German shipbuilder Flender Werft of Lubeck is reported to have been awarded a contract by the Italian ship operating group Grimaldi to construct two 12,000-dwt Roll-On/Roll-Off (RO/RO) vehicle carriers.

According to reports, the two RO/RO ships will have a capacity of about 500 twenty-foot units (TEUs) and 1,150 autos and 195 trucks.

With the two newbuildings, Flender Werft, part of the HDW Group, would have a workload into 1993 and an outstanding order book of about \$323.7 million. Other vessels under construction include three containerships for German and Norwegian owners.

**Full Control Of SOL Pool
Acquired By Transatlantic**

Full control of the Swedish Orient Line (SOL) pool has been taken by Swedish shipowner Transatlantic, a member of the Bilspeidition group, by acquiring the more than 40 percent stake held by Finn carriers.

Transatlantic now has 100 percent of the line, which has been engaged for the last 30 years in the trade between Scandinavia and the eastern Mediterranean.

In the future, Finn carriers will act as SOL's general agent on the Finnish market.

Transatlantic's president **Ake Foster** said the agreement is in line with Transatlantic's goal of obtaining full control of the lines it plans to develop.

**Marine Inland Fabricators
Launches Tow Steering Unit**

Marine Inland Fabricators recently launched and delivered its first tow steering vessel at its Panama City, Fla., yard to a major U.S. towing company.

The tow steering unit has a length of 36 feet 8 inches, beam of 18 feet and hull depth of 7 feet. Power for the unit is supplied by two Detroit Diesel 6-71 engines through 2.5:1

reduction gears and 36- by 24-inch propellers.

The unit, which will be used to tow liquid barges, was developed by Marine Inland Fabricators in close cooperation with the customer. The operators are convinced of the superiority of tow steering units over bowthrusters, as they enable the tow boat to drive its tow around bends and gain speed over the

thrusters which simply push sideways.

"We are told that they decrease trip times significantly and they tow more safely with these units," said **Stewart Sumpton**, a principal of Marine Inland Fabricators.

In describing the steering unit, **Ronnie Posey**, Marine Inland Fabricators superintendent, said, "The boat has no pilothouse—its

engines and steering are remotely controlled from the towboat."

Marine Inland Fabricators is a builder of workboats and barges and specializes in smaller truckable type units.

For free literature describing the capabilities of Marine Inland Fabricators,

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For more information contact John J. Oubre, Executive Director, The Port of Iberia, P. O. Box 9986, New Iberia, LA. 70562-9988. (318) 364-1065



THE PORT OF IBERIA CAJUN HOT!

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New Orleans Port Commission Approves \$70.7 Million Project For New Container Terminal

A \$70.7 million project to construct a new container terminal between its Nashville and Napoleon Avenue Mississippi River wharves has been approved by the New Orleans Port Commission.

Construction work will begin this June, with a scheduled completion date of April 1995. The scheme is part of New Orleans's joint Port Commission-Louisiana State \$187 million five-year development plan for the port.

The Mississippi Riverfront Nashville Avenue Wharf B development, as the project is called, will entail the construction of 3,170 linear feet of heavy duty wharf on an area now occupied by a public grain elevator.

When completed, the complex will provide a multi-user facility, offering container crane rail service, about 150,000 square feet of shedded area and more than 750,000 square feet of open area.

New Ship Orders, Total Order Book Drop In 4th Quarter Of '90

The world shipbuilding order book fell by 1.8 million gross tons to 39.8 million gt in the final quarter of 1990, according to the latest published figures. This is the first decline in total tonnage under construction and on order since 1988 and follows an upward trend over the past four years.

After record figures in the first two quarters of 1990, new orders dropped below 1.9 million gt—a level not seen for more than two decades and 4.1 million gt less than in the previous quarter. New orders totaled 3.3 million gt.

Japan still topped the world shipbuilding table with a total orderbook of 14.7 million gt, or 37 percent of the total, followed by South Korea with 8.5 million gt (21 percent) and Germany with 2.0 million gt (5 percent).

Wilden Pumps Names Argo Marine Distributor —Literature Available

Argo Marine, division of Argo International Corporation, New York, N.Y., recently announced its appointment as a marine distributor for the Wilden Pump and Engineering Co. of Colton, Calif.

Wilden, a manufacturer of double diaphragm air-operated pumps, appointed Argo Marine distributor at three of its key marine offices. The offices are located in New York, N.Y., San Francisco, Calif., and Virginia Beach, Va. Each of the locations will stock both pumping units and renewal parts for marine applications.

"We are extremely excited about being marine distributors for Wilden pumps and parts," said **Thomas J. Calicchio Jr.**, vice president of Argo's Marine Division. "Wilden is by far the marine industry leader for air operated pumps," he added.

For free literature detailing the marine products distributed by Argo Marine,

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APL Wins Right To Carry Military Cargo On Navy's Key Far East Trade Route

The right to carry the lion's share of military cargo on the Navy's key Far East trade route was won by American President Lines Ltd., which outbid its chief rival, Sea-Land Service Inc.

Lykes Bros. Steamship Co. and Sea-Land maintained their top spots for the carriage of Military Sealift Command cargo to Europe and the Mediterranean during the six-month cycle that began April 1.

The Department of Defense's ocean shipper is the Sealift Command, overseeing many worldwide military routes.

According to the Sealift Command, the Pentagon will ship about 2.4 million tons of cargo in the next six month cycle, valued at about \$200 million.

Ship Tax Exemptions Announced By Singapore

In an attempt to develop Singapore into an international maritime center, the Singaporean Government will offer tax exemptions to approved shipping companies.

In his annual budget speech, Richard Hu, finance minister, announced the tax incentive for shipping companies in Singapore under a scheme called the Approved International Shipping Enterprise Scheme.

Effective assessment year 1992, the income of an approved international shipping enterprise from the operations of its non-Singaporean-flag ships outside Singapore would be exempt from tax under the plan.

Cla-Val Announces New 3-Year Warranty For All Automatic Control Valves

Cla-Val recently announced a new three-year warranty for all automatic control valves, backflow preventers and accessories.

Cla-Val will repair or replace defective material, free of charge, which is returned to the factory, provided that after inspection the material is found to have been defective at time of shipment.

For further information and free literature on automatic control valves from Cla-Val,

Circle 37 on Reader Service Card

Lykes Bros. Names Two New Officers

Lykes Bros. Steamship Co., New Orleans, La., recently announced that it has named Neil G. McManus vice president, planning and analysis, and Octave Livaudais assistant vice president, liner services, Atlantic division.

Mr. McManus, who began his career with Lykes in 1980 as a management trainee, has also served as

April, 1991

manager, marketing services in San Francisco and New Orleans.

In 1987, he was named assistant vice president, planning and analysis and later became assistant vice president, liner services, Mediterranean division. In 1990, he was named assistant vice president, liner services, Atlantic division, the position he held until this time.

Mr. Livaudais joined Lykes in

1973, also as a management trainee in New Orleans. He later served in overseas positions including special representative and owners representative in Tokyo, and marketing manager, Far East in Hong Kong. In 1982, he returned to the U.S. and later was named to his most recent position, manager, military movements in New Orleans.

Lykes provides three separate

container services between the U.S. and the North and West Coasts of South America, the East and West Mediterranean, and the United Kingdom and Northern Europe.

Lykes's 18 multipurpose vessels serve trade routes between U.S. ports and the Mediterranean, Far East, North and West Coasts of South America, Africa, the Indian Ocean, and the Red Sea.

THE BEST FENDER FOR DOCKS

Since 1984, Ultra Poly has supplied the Washington State Ferry System, the largest ferry network in the U.S., with black, crosslinked, UV stabilized (UHMW) panels for terminal wingwalls. The system operates Jumbo Class vessels which dock 15 times per day, 365 days per year, regardless of weather. The wingwalls had been faced with 12" X 12" X 26' rubbing timbers made of eucalyptus and ultimately were replaced every two years, some every three months.

In September, 1986 at the Clinton Terminal, a vessel rammed the wingwall, snapping the 12" X 12" timbers. The Ultra Fend faces attached to the timbers remained intact. All but two pads were reapplied to the new timbers. The two that were not reapplied had not cut nor broken on impact, but only stretched as the ferry pressed through the broken wingwall. Terminal engineers are planning to extend Ultra Fend use to the dolphins as well.



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Marine Liability Insurance Increases Up To Threefold For Tankers Trading To US

Increases of as much as threefold in the cost of marine liability insurance faced owners of tankers trading to the U.S. at the recent renewal of most protection and indemnity covers.

In the wake of the Exxon Valdez

disaster, increases required by the Protection and Indemnity Clubs (P&I)—the tanker owners' reinsurers and the underwriters of the excess pollution contract—have produced perhaps the biggest rise in insurance costs many shipowners have seen.

The clubs set general increases that ranged between 20 percent and 60 percent, while the cost of reinsurance bought by the International

Group of P&I Clubs will be about 50 percent higher than last year.

Excess pollution contracts represent one of the biggest rises. Shipowners who decide to buy annual cover for U.S. trading crude tankers under the excess contract, which provides some \$200 million of pollution cover excess of \$500 million, will be paying more than 13 times last year's rate.

House Introduces Foreign Cruise Ship Safety Bill

A bill introduced in the House of Representatives is seeking to extend certain protections to Americans sailing on foreign-flag cruise ships in international waters.

The bill sponsored by Rep. Porter J. Goss, R-Fla., and Rep. Walter Jones, D-NC, would require any death, serious injury or major damage to a ship be reported to the U.S. Coast Guard and investigated.

In the past, cruise company officials have resisted such legislation on the premise that international law already protects passengers and the U.S. regulation would burden the industry. The Coast Guard also opposed tougher legislation.

However, a cruise industry spokesman recently said he was receptive to the bill and would cooperate with the National Transportation Safety Board and the Coast Guard.

Freelin-Wade Company Announces New Flexcoil Polyurethane Tubing

Freelin-Wade Company, McMinnville, Ore., one of the largest manufacturers of polyurethane tubing in the U.S., recently announced the immediate availability of Flexcoil® polyurethane recoil tubing.

Flexcoil, used in the marine repair and fabrication industry, has a tough, durable composition which makes it an excellent choice for multiple air hose uses. Made of polyurethane, Flexcoil enables the operator to stretch it to its maximum straight length and even kink it over rough, sharp metal edges.

For ordering information and details on sizes, colors, fittings, etc., from Freelin-Wade,

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Charles S. Schmukler

Charles S. Schmukler, 87, founder of MMC International Corporation and a well-known figure in the marine services industry for over 50 years, died suddenly on February 19 at his home in Flushing, N.Y.

The original name of the company he established in 1939 was the Marine Plastics Corporation, and it pioneered in the manufacture of deck paving for tankers. After World War II, under the name Marine Moisture Control Company, Mr. Schmukler seized on the new opportunity presented to the maritime industry by expanding rapidly into such product areas as tank-gaging systems, hydraulic valve systems and cargo-handling hose couplings. In 1983 the company adopted its present name, MMC International Corporation.

Mr. Schmukler turned over management of the company to his son, William Henry, in 1976, although he remained active as chairman. He retired officially in 1987 but maintained his board position until his death.

All Countries Except U.S. Agree On Terms For Future Liner Code Conference

With exception of the U.S., all countries recently agreed on terms for a future conference aimed at updating the United Nations liner shipping code. The agreement was reached after a 15-month stalemate.

The developing-country bloc known as the Group of 77 had previously insisted that the U.S. and other nonsignatory countries be barred from taking part in the scheduled review of the U.N. Code of Conduct for Liner Conferences.

The group yielded to the position of Western countries that had maintained that all parties be allowed to participate in the review.

Under Unctad (United Nations Conference on Trade and Development), which administers the code, national shipping lines of an exporting and importing nation are entitled to carry equal volumes of their mutual foreign trade carried by lines that belong to the collective rate-setting groups called conferences.

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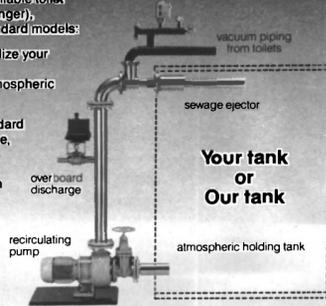
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Both models have the same standard design and components; therefore, you do not pay for special design engineering. You do receive high quality components with a proven history of reliability.

EVAC vacuum toilet systems already exist in over 2,000 ships worldwide. Model 0111 and Model 1111, with one or two pumps, are available from stock to expedite delivery.



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Lykes Obtains Limited Foreign-Flag Authority

Lykes Bros. Steamship Co., Inc., New Orleans, La., has been notified by the Maritime Administration that further clarifying information is required to fully approve the company's request to operate 10 multipurpose foreign-flag vessels in various U.S. foreign trade areas, but no approval is necessary for Lykes to

operate flag vessels in areas that would not compete with any essential American-flag service.

As a U.S.-flag subsidized carrier, Lykes must obtain approval from the Maritime Administration in order to purchase, charter and operate foreign-flag vessels in U.S. commerce.

MarAd's ruling has made clear that Lykes may obtain foreign-flag vessels and operate them in certain trade routes.

Older Ship Replacement May Be Uneconomic, U.K. Study Says

A recently released U.K. study of vessel service life expectancy and life extension has found that the replacement of older tankers and bulk carriers might be economically unjustifiable based on present new-building costs.

The study, "Bulk Vessel Life Expectancy: Refit Versus Replacement," published by Maritime Strategies International, points out that ships above 15 years old still produce a sufficiently high rate of return and owners should consider refit before replacement.

The report, undertaken by Maritime Strategies International and Stonehill Consultants of the U.K., bases its assertions on the cost of refurbishment as opposed to replacement. The cost of the refurbishment of a VLCC, the report says, is about \$11 million as compared with a newbuilding, which costs about \$110 million. The study also challenges the assumption that tankers and bulk carriers have service lives in excess of 15 to 20 years.

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Marine Products from **TRINOVIA**

New Record Tonnages At Corps Locks

New record tonnages have been reported at the locks and dams of the Mississippi River within the U.S. Army Corps of Engineers, St. Louis District, for 1990. Lock and Dam 24 at Clarksville, Mo., Lock and Dam 25 at Winfield, Mo., the newly opened Melvin Price Locks and Dam at Alton, Ill., and Locks 27 on the Chain of Rocks Canal at Granite City, Ill., all surpassed the previous record tonnages set in 1983.

Locks and Dams 24 and 25 passed almost 42.4 million tons each. The previous record was slightly less than 37.9 million. Melvin Price passed almost 80.5 million tons. The previous record at old Locks and Dam 26, which was replaced by Melvin Price Locks and Dam in February 1990, was 73.7 million. Locks 27 passed almost 85.4 million tons of traffic. The previous record was 80.8 million tons.

Ship Security Boosted By Revised Anti-Drug Smuggling Plan

Vessel Owners are being asked by the U.S. Customs Service to sign on to a revised anti-drug smuggling plan that requires them to implement more stringent security measures.

Shipowners, under the updated version of the Sea Carrier Initiative Agreement, voluntarily agree to undertake tighter security measures in return for the possibility of lesser government penalties if a smuggler is found to have brought drugs on board one of their ships. The preliminary penalty for a first violation without the carrier's complicity is automatically reduced 50 percent for carriers who sign the agreement. The Customs Service will expedite its handling of requests for further penalty reductions for first and second violations, issuing a decision usually within 120 days. Carriers that remain clean for two years get a fresh start.

The Custom Service urges carriers to band together and refuse to carry shipments from problem ports until they improve security.

BUYERS DIRECTORY

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

ABRASIVES

Chesapeake Specialty Products, Inc., 5055 Northpoint Blvd., Baltimore, MD 21219
Stan-Blast Abrasives, P.O. Box 968, 3300 River Road, Hawley, LA 70059
AIR CONDITIONING AND REFRIGERATION—Repair & Installation
Adria Marine Corp., 320 Cantor Ave., Linden NJ 07036
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Stal Refrigeration AB, Butangsgatan 16, S601 87 Norrköping, SWEDEN
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
York Int'l, P.O. Box 1592-083G, York, PA 17405

BALLAST

Chesapeake Specialty Products, Inc., 5055 Northpoint Blvd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste 203, Tucson AZ 85714
Queen City Iron & Steel, P.O. Box 7205, Charlotte, NC 28241-7205

BARGE BUILDING

Conrad Industries, P.O. Box 790, Morgan City LA 70381

BARGE—Leasing

McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

BASKET STRAINERS

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

BEARING—Rubber, Metallic, Non-Metallic

B.F. Goodrich, Marine Products Group, 6061 B.F. Goodrich Boulevard, Jacksonville, FL 32226
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Thomson Gordon Ltd., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6
Waukesha Bearings, P.O. Box 1616, Waukesha WI 53187

BOILER CLEANING

Thomas C. Wilson, Inc., 21-11 44th Ave., Ste. 1, Long Island City, NY 11101

BOILER—Manufacturers

Aalborg Ciseriv (Miami), Inc., 1539 SW 21st Avenue, Ft. Lauderdale, FL 33312

BROKERS

Ascan Astad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335-2900
Energy Centre, 1100 Poydras Street, New Orleans, LA 70163-2900
Diversified Marine Brokerage, 1201 Northern Blvd., Manhasset, NY 11030
Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
Nowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BUNKERING

Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

CHAIN

Baldt, Inc., 6 M. Butler St., Chester, PA 19013
Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
G.J. Wortelboer Jr. B.V., Postbus 5003, 3008 AA Rotterdam, NETHERLANDS

CHEMICAL CLEANERS

Charlie Chemical & Supply, Inc., P.O. Box 4639, Greenville, MS 38704-4639

CHOCKING COMPOUNDS

TW Philadelphia Resins, 130 Commerce Drive, Montgomeryville, PA 18936

CLAMPING—Pipe, Tubes, Hose

ZSI, 32497 Schoolcraft Road, Livonia, MI 48150

COMPACTORS

International Compactor, Inc., P.O. Box 5918, Hilton Head, SC 29938
A/S Vesta, Skudehavsvvej 27, DK-2100 Copenhagen, DENMARK;
Sales Agents: American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906, USA

COMPUTERIZED INFORMATION SYSTEMS

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

CONDENSERS/SEPARATORS

Beard Industries Inc., P.O. Box 31115, Shreveport LA 71130
IMO Delaval Inc., P.O. Box 6550, Lawrenceville, NJ 08648
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
Wright Austin Co., 3250 Franklin St., Detroit MI 48207

CONTROL SYSTEM—Monitoring

Autronica Marine USA, 234 Industrial Parkway, Northvale, NJ 07647
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IMO Industries, Gens Sensors Division, One Cowles Rd., Plainville CT 06062
Lyngsoe-Valmet Marine A/S, P.O. Box 130, N-3430 Spikkestad, NORWAY
MMC International, 60 Inp Dr., Inwood NY 11696
NAMCO Controls, 7567 Tyler Blvd, Mentor OH 44060
Norcontrol A/S, P.O. Box 1024, N-3191 Horten, NORWAY
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Robertson-Stigmatte, 400 Oser Avenue, Hauppauge, NY 11788
TANO Marine Systems Inc., 4301 Poche Court West, New Orleans LA 70129
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406

CRANE—HOIST—DERRICK—WHIRLIES

The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Del Gavo Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Liebherr-Werk Nenzing GES.mbn, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus Hebezeug GmbH, D-5810 Witten, GERMANY
Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883
Reco Crane Co., 5734 Jefferson Highway, New Orleans LA 70181
Westmont Industries, 10805 Painter Ave., Santa Fe Springs, CA 90670
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

CYLINDER LINERS

Teledyne Metal Finishers, 1725 East 27th St., Cleveland, OH 44114

CYROGENICS

Technigaz, Division of Bouygues Offshore, 3 rue Stephenson, 78884 St. Quentin en Yvelines, FRANCE

DECK MACHINERY—Cargo Handling Equipment

All Set Marine Lashing AB, P.O. Box 14112, S-161 14 Bromma, SWEDEN
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788
McEroy Machine & Mfg. Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
Seattle Crane & Equipment Co., Inc., 4403 20th Street East, File, WA 98424
Willem Pot b.v., P.O. Box 29102, 3001 GC Rotterdam, The Netherlands

DECKS

Boatife, 205 Sweet Hollow Road, Old Bethpage, NY 11804

DEHUMIDIFIERS

L&C Associates, 216 Lafayette Rd., North Hampton NH 03862

DIESEL ACCESSORIES

Coltec Industries Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Diesel America Inc., 5217 River Rd., New Orleans LA 70123
Gearhard's Inc., P.O. Box 10161, Jefferson, LA 70181
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison IL 60101
Pow'R-Quik, 5518 Mitchelldale, Houston, TX 77092

DIESEL ENGINE—Spare Parts & Repair

Aalborg Ciseriv (Miami) Inc., 1539 SW 21st Avenue, Ft. Lauderdale, FL 33312
Alaska Diesel Electric, P.O. Box 70543, Seattle, WA 98107
Coltec Industries, Parts & Service Div., 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315
Gulten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
Grace Dearborn, W.R. Grace & Co., 300 Genesee Street, Lake Zurich, IL 60047
Hatch & Kirk, 5111 Leary Avenue NW, Seattle, WA 98107
KHD Canada, Inc., 4420 Garand, Ville St-Laurent, Quebec, CANADA H4R 2A3
Kim Hotstart Mfg Co., E 5724 Broadway Ave, P.O. Box 42, Spokane WA 99210
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1, GERMANY
MAN B&W Diesel, 50 Broadway, 18th Fl., New York, NY 10004
MTU of North America, 10450 Corporate Drive, Houston, TX 77478
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY
Pacific Rim Diesel, 570 Mercer St., Seattle, WA 98109
Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW, ENGLAND;
Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77064
S.E.M.T. Pielstick, 2 Quai de Seine, Saint Denis, Paris, FRANCE 93203
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166

DIVING & SALVAGE

H.J. Merrhue, P.O. Box 23123, New Orleans LA 70183
Hudson Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731
Sea-Side Diving, 28612 Harper Ave., St. Clair Shores, MI 48081

DRY DOCKS—Design

Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Marine Design Services, P.O. Box 928, Bonita CA 92002
MAN GHI Steierische, P.O. B. 110240, D-4200 Oberhausen 11, GERMANY

ELECTRICAL EQUIPMENT

Consolidated Switch Gear Inc. P.O. Box 8745, Mandeville, LA 70470-8745
L. F. Gaubert & Co., Inc., P.O. Box 50500, New Orleans LA 70150
MMC International, 60 Inp Dr., Inwood NY 11696

P.J. Plishner Marine/Radio Research Instrument Co., 584 N. Main St., Waterbury, CT 06704-3505

SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116

ELECTRONIC DISPLAY

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

ELECTRONIC ENCLOSURES

A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

ELECTRONIC INFORMATION SUPPORT

Inventory Locator Service, 3965 Mendenhall Rd. South, Suite 10, Memphis, TN 38115

ENGINE TEST EQUIPMENT

General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360
Instruments, Computers, & Controls, Inc., 6942 Haven Creek Dr., Katy, TX 77449

ERIRBS

Alden Electronics, 40 Washington St., Westborough, MA 01581

EQUIPMENT—Marine

Byrne, Rice & Turner, Inc., 1172 Camp St., New Orleans, LA 70130
Gladsky Marine, Garves Point Rd., Glen Cove, NY 11542
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Ovako Steel Inc., P.O. Box 745, Avon, CT 06001

EVAPORATORS

Alfa-Laval, Desalt A/S, Stambolmen 93, DK-2650 Hvidovre, Copenhagen, DENMARK
Aqua-Chem, Water Technologies Div., P.O. Box 421, Milwaukee, WI 53201
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130

FANS-VENTILATORS-BLOWERS

Carling Turbine Blower Co., 10 Nebraska St., P.O. Box 88, Worcester, MA 01613
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS

Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02635
Non-Ferrous Bolt & Mfg. Co., 4085 Nevins Dr., Suite C, Las Vegas, NV 89103
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston, TX 77020
Rowe Bumpers, Conveyors & Caster Corp., 3501 Detroit Ave., Cleveland, OH 44113
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook, VA 22524
Soldier Plastics Co., 200 Industrial Dr., Delmont, PA 15626

FUEL ADDITIVES, CONDITIONING

U.S. Borax/Industrial Chemicals, 3075 Wishire Boulevard, Los Angeles, CA 90010

GALLEY EQUIPMENT

Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062
Gaylord Industries, 10900 S.W. Avery St., P.O. Box 1149, Tualatin, OR 97062
McEroy Machine & Mfg. Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

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Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32966
Sea Systems Inc., 65 Avco Road, Ward Hill, MA 01835
Westmont Industries, 10805 Painter Ave., Santa Fe Springs, CA 90670
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

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Beard Industries Inc., P.O. Box 31115, Shreveport LA 71130
Thomas C. Wilson, Inc., 21-11 44th Avenue, Long Island City, NY 11101

HORNS/WHISTLES

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

HOSE

HBD Industries, Inc., 1801 S. Railroad Street, Salisbury, NC 28145-0948

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Aerocup Corporation, 3000 Strayer, P.O. Box 631, Maumee, OH 43537-0631
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavo Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072

INCINERATORS

Teartec A/S, P.O. Box 100, N-4912 Gjeving, NORWAY
A/S Vesta, 27 Skudehavsvvej, DK-2100 Copenhagen DENMARK. US Agent: American United Marine, 5 Broadway, Rte 1, Saugus, MA 01906

INSULATION

Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729

JOINER—Wateright Door—Paneling—Ceiling System—Decking

Cupples Products, 2650 S. Hanley Rd., St. Louis, MO 63144
GEC-Marcioni Electronic Systems Corp., 550 S. Fulton Avenue, Mount Vernon, NJ 10550
IMAC AB, Berga Alle 1, S-252 55 Helsingborg, SWEDEN
U.S. Rep: Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606

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R.W. Fernstrom & Co., 1716 Eleventh Ave., Menominee, MI 49858
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

LEGAL SERVICES

American Maritime Correspondents, One Embarcadero Center, Suite 330, San Francisco, CA 94111
John Jozwick, c/o Bryan, Schiffrin & McMonagle, First & Cedar Bldg., Ste 350, 2701 First Ave., Seattle, WA 98121

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

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

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Archway Marine Lighting, 4501 Swan Ave., St. Louis, MO 63110
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The L.C. Doane Co., P.O. Box 975, Essex, CT 06426
Nautilus Equipment Ltd., P.O. Box 66, Station M, Halifax, Nova Scotia B3J 2L4, CANADA
Phosora Products, 6161 N 64th St., Milwaukee WI 53218

LINE BLINDS

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

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Vt. Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564
QED, 4646 N. Witchback Road, Virginia Beach, VA 23455

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING

Del Gavo, 619 Industrial Rd., Carlstadt, NJ 07072
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315
Gulten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231

MACHINING—On Site Repair

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

MARINE ACCOMMODATIONS

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MARINE FURNITURE

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

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Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
B.C. Research, 3650 Westbrook Mall, Vancouver, B.C. CANADA V6S 2L2
CDI Marine Co., 9487 Regency Square Blvd., Suite 500, Jacksonville, FL 32225
CI Marine, 18 Church Street, Georgetown, CT 06829
Onis Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants, 15301 First Ave S., Seattle WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007

Arthur D. Darden, 3200 RidgeLake Dr., Suite 403, Metairie LA 70002

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

Designers & Planners, 2611 Jefferson Davis Highway, Suite 3000, Arlington, VA 22202

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

Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706

Fisher Maritime Transportation Counselors, Inc., 71 Valley Street, South Orange, NJ 07079

GHM Inc. (Industrial Measurement Consultants), P.O. Box 1836, Newport News, VA 23601

Gibbs & Cox, Inc., 50 West 23rd Street, New York, NY 10010

The Gloston Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104

Morris Guralnick Associates, Inc., 130 Sutter Street, Suite 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

JFI Inc., No. 4 Executive Campus, Culbert Blvd. & Route 70, P.O. Box 5031, Cherry Hill, NJ 08034

R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073

James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125

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

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

McEroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454

John J. McMillen Associates, Inc., 1 World Trade Center, Suite 3000, New York, NY 10048

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

Fendall Marbury, 9 Neal Street, 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. Mellusi & Co., 71 Hudson St, New York, NY 10013
Nautical Designs, Inc., 2101 S Andrews Ave, Suite 202, Ft Lauderdale FL 33316
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean Oil International Engineering Corp., 3019 Mercedes Blvd, New Orleans LA 70114
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 667 Mission St., San Francisco, CA 94105
Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
Sea School, 10812 Gandy Boulevard, St. Petersburg, FL 33707
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church VA 22041; 1305 Franklin -1b indent-St., Suite 210, Oakland, CA 94612
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
F.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Systems Engineering Associates (SEACOR), 200 East Park Dr., Suite 600, Mt Laurel NJ 08054
TIMSCO, P.O. Box 91360, Mobile AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT

AIKT, High Seas Dept., 412 Kemble Ave., Room C880, Morristown, NJ 07960
Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
Hose McCann, 9 Smith Street, Englewood, NJ 07631
IDB Aero-Nautical Communications, Inc., 15200 Omega Dr., Rockville, MD 20850-3240
Kevin Hughes Ltd., New North Rd., Hainault, Wford, Essex IG6 2UR ENGLAND
Mackay Communications, 441 US Highway #1, P.O. Box 331, Elizabeth NJ 07207
Maxon, South Boundary St., P.O. Box 69, Tell City, IN 47586
Mobile Telesystems, Inc., 300 Professional Drive, Gaithersburg, MD 20879
Naval Electronics, 5417 Jervise Circle, Tampa FL 33634
Robertson Marine Systems, 3000 Kingman Street, Suite, 207, Metairie, LA 70006
SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116
S.P. Radio A/S, DK-9200, Aalborg SV, DENMARK
Simrad, 620 Northwest Bright Street, Seattle, WA 98107
Singapore Telecom, Orchard Post Office, P.O. Box 38, SINGAPORE 9123
Sperry Marine Inc., 1070 Semmole Trail, Charlottesville VA 22901
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Tribble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waterway Communications System, Inc. 453 E. Park Place, Jeffersonville, IN 47130

NOZZLES

Nautican Enterprises Ltd., 407 Mountain Highway, North Vancouver, B.C. V7J 2L1
OIL—Marine—Additives
Castrol, Inc., Raritan Plaza II, Raritan Center, Edison, NJ 08837
Chevron, USA, 575 Market Street, San Francisco, CA 94105
Exxon Company International, 200 Park Ave., Bldg 222, Room A279, Florham Park NJ 07932, P.O. Box 4706, Houston, TX 77210-4706
Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001
Texaco International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS

Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974-0556
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale NJ 07647
FAST Systems, Inc., 3240 N. Broadway, St. Louis, MO 63147
MMC International, 60 Hip Dr., Inwood NY 11696

PAINT—COATING—CORROSION CONTROL

American Abrasive Metals Co., 460 Cot St., Irvington NJ 07111
Ameron, 201 N. Berry St., Brea, CA 92622
Chugoku Marine Paints (USA) Inc., 1610 Engineers Road, Belle Chasse, LA 70037
Enviro Coatings, Inc., 4560 Belt Line Rd., Suite 300, Dallas, TX 75244
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502
GlobeTech, 9801 Westheimer St., Ste. 202, Houston, TX 77042
International Paint (USA) Inc., 6001 Antoine Dr., P.O. Box 4806, Houston TX 77210-4806
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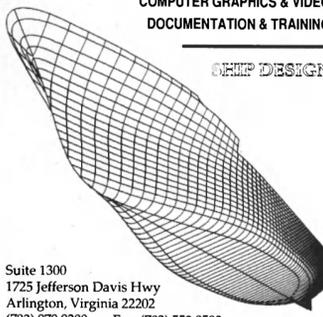
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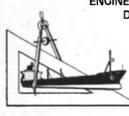
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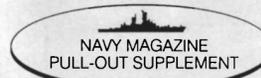
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