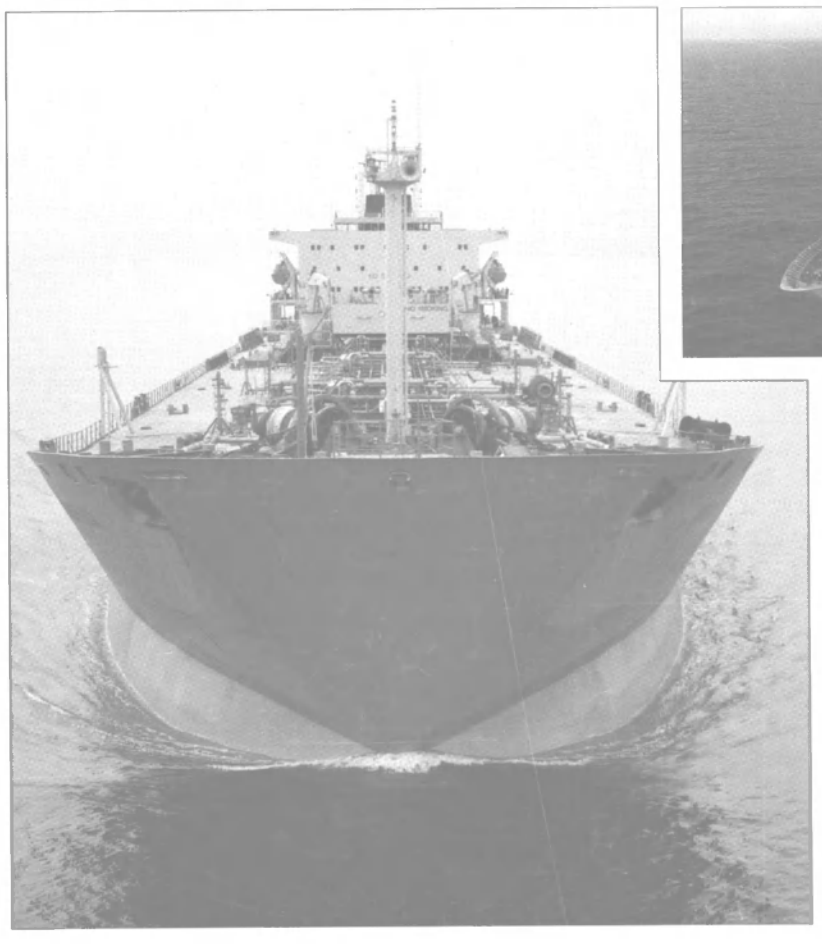
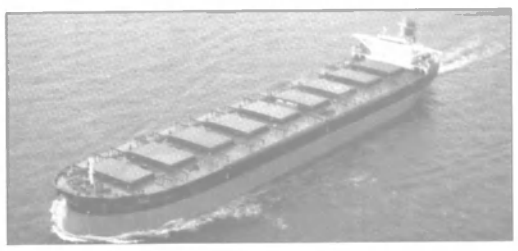
MARITIME REPORTER
AND
ENGINEERING NEWS

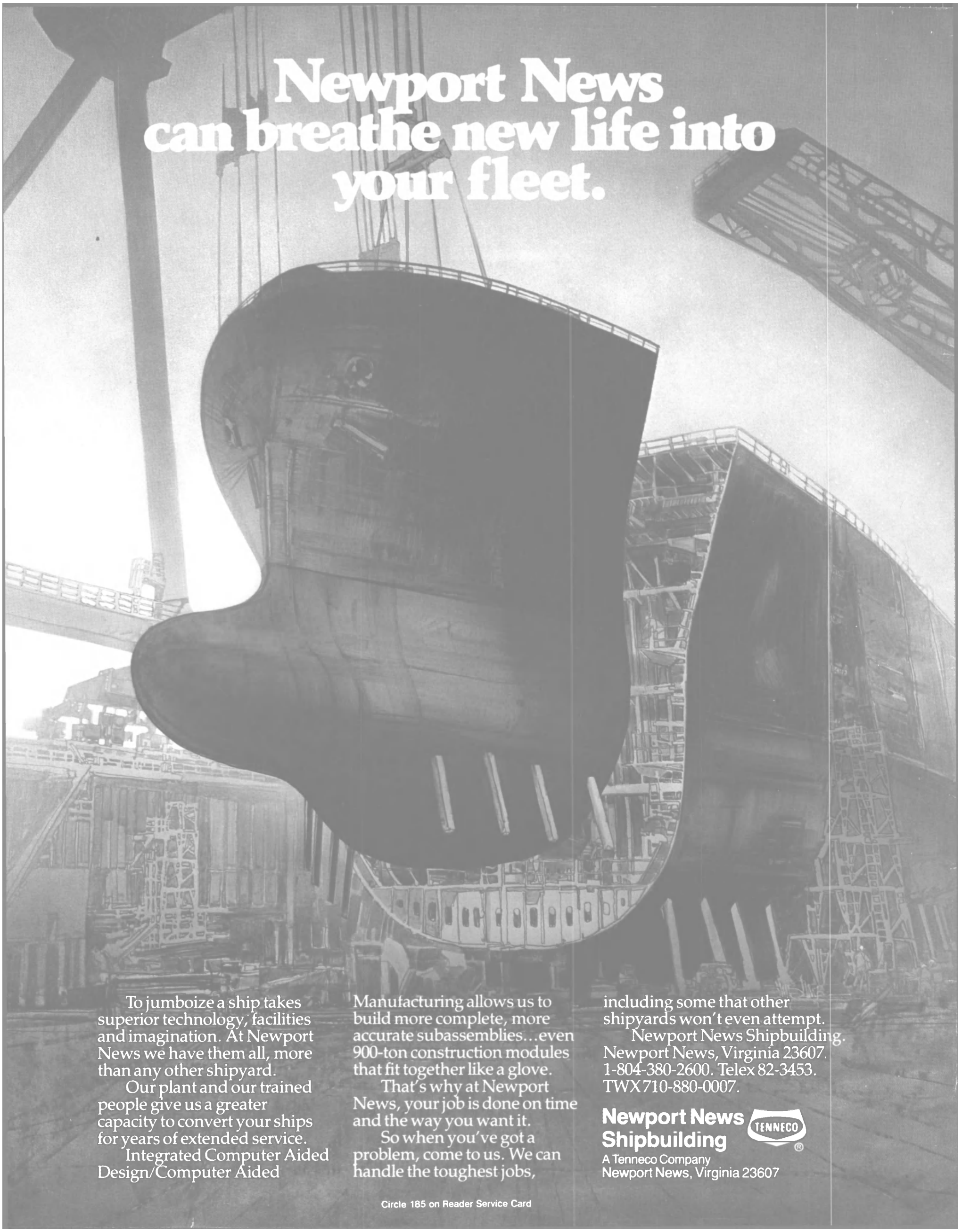




NAVAL TECHNOLOGY & SHIPBUILDING

OUTSTANDING OCEANGOING VESSELS

DECEMBER 1987 ISSUE



To jumboize a ship takes superior technology, facilities and imagination. At Newport News we have them all, more than any other shipyard.

Our plant and our trained people give us a greater capacity to convert your ships for years of extended service.

Integrated Computer Aided Design/Computer Aided Manufacturing allows us to build more complete, more accurate subassemblies...even 900-ton construction modules that fit together like a glove.

That's why at Newport News, your job is done on time and the way you want it.

So when you've got a problem, come to us. We can handle the toughest jobs, including some that other shipyards won't even attempt.

Newport News Shipbuilding.
Newport News, Virginia 23607.
1-804-380-2600. Telex 82-3453.
TWX 710-880-0007.

Newport News Shipbuilding
TENNECO®
A Tenneco Company
Newport News, Virginia 23607

Circle 185 on Reader Service Card

Unsurpassed Ship Docking and Towing Services Since 1864

The magnificent oceanliner Normandie entering New York Harbor, c. 1935, as depicted by the marine artist, William G. Muller. We at McAllister take pride in being part of the history and lore of the harbor.

McAllister Brothers Inc., Towing and Transportation
17 Battery Place, New York, NY 10004 (212) 269-3200

McAllister

NEW YORK • PHILADELPHIA • BALTIMORE • HAMPTON ROADS • WILMINGTON • CHARLESTON • JACKSONVILLE • SAN JUAN

ON THE COVER

Cover Photos—clockwise from logo: Andrew J. Higgins (TAO-190), Avondale; Jasmine, Samsung; Norsun, Nippon Kokan; Nordflex, sister ship of the Nordfarer, Burmeister & Wain Shipyard; Transshelf, Wartsila; (center) Sovereign of the Seas, Althsom Chantiers de l'Atlantique.

Outstanding Oceangoing Vessels Of 1987
PAGE 12

Naval Technology & Shipbuilding Supplement
PAGE 31

Philseco Appoints Salonga President

The board of directors of the Philippine Shipyard and Engineering Corporation (Philseco) recently announced the appointment of **Feleciano G. Salonga** as president.

Mr. **Salonga** was previously vice president of marketing for Philseco.

Philseco is a joint venture company of the National Development Corporation, a wholly owned subsidiary of the Philippine National Bank and Kawasaki Heavy Industries, Ltd. Philseco began ship repair operation in January 1982 and is one of the most modern facilities in the world. The yard has the ability to handle up to 300,000 dwt at their graving dock and facilities in Subic Bay.

The American agents for Philseco are East Coast Marine Associates, Inc. in New York City.

For more information and free literature on Philippine Shipyard and Engineering Corporation,

Circle 26 on Reader Service Card

IHI Delivers Pure Car Carrier To Central Gulf Lines

Central Gulf Lines, Inc., of New Orleans, La., has taken delivery of the Pure Car Carrier (PCC) Green Lake from the Ishikawajima-Harima Heavy Industries of Japan.

The U.S.-flag car carrier will transport Toyota automobiles from Japan to the U.S. under a multiyear contract.

MARITIME REPORTER and Engineering News

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

Publishers: JOHN E. O'MALLEY, CHARLES P. O'MALLEY
Editorial Director: CHARLES P. O'MALLEY
Editor: JOHN SNYDER
Senior Editor: THOMAS H. PHILLIPS
Consulting Editor: ROBERT WARE
Advertising Sales Director: JOHN C. O'MALLEY
Regional Sales Manager: LUCIA ANNUNZIATA
Production Manager: LILIAN IRVINE
Circulation Manager: M. SOTTILE

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

REPRESENTATIVES

U.S. Gulf States — **MR. JAMES N. McCLINTOCK**
2020 N. Causeway Blvd., Suite D
Mandeville, LA 70448
Telephone: (504) 626-7990
Telefax: (504) 624-5163

France — **MR. NORBERT M. HELLIN**
6 bis, rue de la Belle Feuille
F-92100 Boulogne, France
Telephone: 33-1-46-05-63-77
Telefax: 33-1-46-03-33-21

Italy — **MR. VITTORIO F. NEGRONE**
EdIconsult Internazionale
Piazza Fontane Marose, 3-16123 Genova, Italy
Telephone: (010) 543.659-268.334-268.513
Telex: 211197 EDINT I

Scandinavia — **MR. STEPHAN R. G. ORN**
AB Stephan R. G. Orn
Box 184, S-271 00 Ystad, Sweden
Telephone 0411-184 00
Telex: 33335 Orn S Telefax: 411 10531

West Germany — **MR. WOLF O. STORCK**
Schiflahrtswerbung Karl-Otto Storck
Stahlwiete 7, 2000 Hamburg 50,
Federal Republic of Germany
Telephone 040/850 0071
Telex: 17403448 STORCK
Telefax: (040) 850-7758

United Kingdom — **MR. MICHAEL J. DAMSELL**
Euromedia, Ltd.
Tern House, Upper West St.,
Reigate, Surrey RH2 9HX, England
Telephone: 07372 42558
Telex: 932699 KENPUB G.

Korea — **MR. CHRIS MAENG**
IPR Int'l PR, INC.
Yongsan, P.O. Box 100
Seoul, Korea
Telephone: 273-7765
Telex: MOCNDM K23231

Japan — **MR. TOSHIO EGUSA**
Publinetwork, Inc.
Kaneko Bldg. 4-29-8,
Shimbashi, Minato-ku, Tokyo 105 Japan
Telephone: (03) 459-9618
Fax: 436-1931 Telex: 2425280 BESNA J

Singapore — **MR. VICTOR CHIA**
Market Trends Pvt. Ltd.
122 Middle Road, #07-08
Midlink Plaza, Singapore 0718
Telex: HENSAL RS20006

MARITIME REPORTER AND ENGINEERING NEWS
ISSN-0025-3448
No. 12 Volume 49

118 EAST 25th STREET
NEW YORK, N.Y. 10010
(212) 477-6700
Telex: MARINTI 424768
Telefax: (212) 254-6271

ESTABLISHED 1939

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

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

Member
BPA
Business Publications Audit of Circulation, Inc.

Sonat Offshore And A/S Smedvig Drilling Form Joint Venture

Sonat Offshore Drilling Inc. announced recently that it has agreed in principle with A/S Smedvig Drilling Company to form a joint venture to own and operate the two semi-submersible drilling rigs Henry Goodrich and West Vanguard. Sonat Offshore and Smedvig will each have a 50 percent ownership interest in the joint venture, with Smedvig contributing an undisclosed amount of cash in addition to its West Vanguard for its 50 percent interest and Sonat Offshore contributing the Henry Goodrich for its 50 percent interest.

Offshore Marine Service Association Meets In New Orleans

The third quarterly business meeting for 1987 of the Offshore Marine Service Association (OMSA) was held recently at the Doubletree Hotel in New Orleans, La.

Congressman **Billy Tauzin** (Louisiana), chairman of the Outer Continental Shelf Subcommittee of the Merchant Marine & Fisheries Committee, discussed possible methods of stimulating gas exploration and drilling activity to help revitalize the economy.

Also included was an executive session of the board of directors, followed by a joint meeting of the board and general membership.

BIW Announces Major Reorganization

Duane Fitzgerald

A major reorganization is being implemented at Bath Iron Works Corporation that will strengthen the overall management team and provide a framework required to optimize the business's performance and growth, according to **William E. Haggett,** chairman and chief executive officer.

In the new organizational structure **Duane (Buzz) Fitzgerald,** a veteran Bath attorney and shipyard counsel, will fill the newly created executive vice president post, reporting to the chairman.

Reflecting the major realignment of functions and business objectives was assignment of responsibilities to four senior vice presidents who will report to the executive vice president: **Royce A. Young Jr.,** Portland; **Steven G. Buttner,** operations; **Howard J. Yates,** finance and administration; and **James M. Blenkhorn,** business development. Mr. **Young** and Mr. **Blenkhorn** have been senior vice presidents, with Mr. **Buttner** and Mr. **Yates,** promoted into positions of added responsibilities.

In addition to the elevation of Mr. **Buttner** and Mr. **Yates** to senior vice presidents, those promoted to vice president were: **Harland D. Hatch,** from production manager to vice president of production; **Kevin P. Gildart** from director of materials to vice president of human resources; **Jerry L. Steiner** from director of strategic planning to vice president of materials; **Thomas S. York** from facilities director to vice president of facilities engineering; **Peter E. Jaquith** from director of process control systems to vice president of engineering.

William D. Potter moves from vice president of engineering to vice president of technology transfer programs, **Jan R. Erikson** continues as vice president of lead yard services, as does **Lennart M. Thorell,** vice president of international marketing, **William E. Graham,** vice president of contracts, and **Denis K. Dugan,** vice president of management systems.

Farrell Calls For Presidential Commitment To The U.S. Maritime Industry

Joseph A. Farrell III

In an address to the National Convention of the Propeller Club of the United States recently, **Joseph Farrell,** president of the American Waterways Operators, called for the Republican and Democratic party platforms to include a plank to rescue the U.S. merchant marine.

"Few issues face the next President which are more ominous or more riveting, than the future of the American merchant marine," Mr. **Farrell** said.

The national barge and towing industry association's leader outlined a number of problems currently plaguing the U.S. merchant marine, including the effect of the budget deficit on the industry, absence of maritime focus in the Congress, federal regulatory excess, and the lack of consensus on maritime policy that is evident in both the federal government, and within the industry itself.

However, he emphasized that the lack of Presidential leadership over many years has been the chief cause of erosion in the nation's maritime assets.

"I believe the real problem has been the absence of a clear and firm resolve by the sitting President of the United States," Mr. **Farrell** said. "The essential precursor and precondition to executive branch leadership is a focused commitment by the President to rescue the U.S merchant marine," he said.

Mr. **Farrell** said that the lack of genuine Presidential resolve concerning the merchant marine has led to "an executive branch of government in disarray." As an example, he pointed to the Administration's wide internal disagreement on the effects of the new U.S.-Canadian Trade Agreement on the American merchant marine.

While Mr. **Farrell** did not himself propose a comprehensive maritime policy for adoption by the Republican and Democratic parties, he did offer three suggestions for inclusion in a platform plant to enhance the nation's maritime assets.

First, he issued an appeal for a constructive partnership between the federal government and the maritime industry, formed to fashion a modern maritime policy. This modern policy, he said "must incorporate such things as technological development, regard for competition, and fresh look at the whole spectrum of subsidies. Modern subsidy policy should encourage and reward innovation, productivity gains, and this enlightened society's insistence on protecting the well-being of workers and the environment."

Second, he called for the next President to appoint a maritime czar, with Cabinet-level rank in the executive branch to lead the development of a modern maritime policy. This official would report directly to the President. Mr. **Farrell** cautioned that such an appointment would only be successful if it were backed by the full commitment and resolve of the President of the United States to preserve the merchant marine.

Third, he called for sweeping reform of the regulatory machinery of the federal government, including the establishment of an appellate body, perhaps in the Office of Management and Budget (OMB), to which industry could turn for review of regulatory agency activity, and for the institution of sunset provisions for outdated regulations. He pointed out a number of "mindless regulations," recently imposed on the industry, that he termed "examples of regulations that should never be issued by a responsible and responsive government." He stated that an appeals group in OMB "would draw to the attention of the appropriate Cabinet Secretary and proposals that they judged egregious. This approach would at least give foolishness no place to hide," Mr. **Farrell** said.

Mr. **Farrell** concluded his address by exhorting industry leaders to make the necessary sacrifices to join together and form an alliance with the federal government, to shape a modern maritime policy, "which will first protect this nation's future, but which will also be an investment in a future which will result in a cornucopia of benefits for all."

OMAE '88 To Be Held In Houston, Texas February 7-12, 1988

The seventh international conference, symposia and exhibition of Offshore Mechanics and Arctic engineering (OMAE) will be held at the Adam's Mark Hotel in Houston, Texas, on February 7-12, 1988.

For full details, and a copy of the program, write Dr. **Jin S. Chung,** International OMAE Council, c/o Colorado School of Mines, 1500 Illinois Street, Golden, Colo. 80401.

ELECTRONICS UPDATE

Furuno Introduces New Products

Furuno U.S.A., Inc. of South San Francisco, Calif., recently announced the introduction of several new products.

One is a new digitized daylight bright radar, FR-8030D, that packs a lot of performance features and a full 12-inch diagonal CRT into a cabinet only 13.3 inches wide. While the model number might indicate that this radar is a "little brother" to the FR800D Series unit, it is really more of a "big brother" to the FR-600 Series. The screen is dramatically larger than the 600's and presents the same number of scan lines and high definition as the larger radars, yet is available at a far more cost-effective price.

The FR-8030D uses four levels of quantization to assure a bright, crisp picture for superb target detection. All operational data is displayed on the screen for maximum user convenience.

Output power is 3 kw, with eight range scales from ¼ to 48 n.m. Standard features include Electronic Variable Range Marker, Electronic Bearing Line, Guard Zone, alarms, Furuno's low noise custom microwave integrated circuit receiver design, and a new 4-inch aerodynamic open antenna array.

The FR-8030D operates from a built-in 10.2-40 VDC power supply and requires just 50 W.

For more information and free literature on the FR-8030D,

Circle 14 on Reader Service Card

Furuno's new high-performance color video plotter, the GD-180, is a 12-inch, eight-color video plotter that presents one of the clearest, sharpest, most comprehensive plot pictures in the industry, with more than 5,000 pixels per square inch. A built-in 3.5-inch floppy disk drive has the capacity to store up to seventy 2,000-point digitized charts, and the system provides free selection of seven plotting colors and full remote control of all functions.

A continuously variable plot area offers scale factors of 1/1,000 (less than one square mile) to 1/9,500,000 (more than 700 square miles), with 10 programmable scales for quick changes. The plot interval can be set either in time (0.00 to 1.00 hours) or distance (0.0 to 99.9 n.m.).

GD-180 users may enter as many as 1,000 distinctive marks, made up of any mix of 10 different standard marks, event marks from external navigation equipment, and marks associated with connecting lines. In addition, two circular or parallel-line alarm zones, 100 waypoints, 30 satellite fixes, a destination point, 10 danger points, and two-digit numerical time, temperature, or depth notation may be added along the courseline.

Waypoint entry can be in the user's choice of L/L, TDs, range/bearing, own ship position, event mark, or from an external nav receiver that provides Furuno CIF or appropriate NMEA 0183 output. A unique feature of the GD-180 is that more than one nav receiver may be connected and, if one fails, it will automatically switch to an alternate in user-selected priority order.

For additional information and free full-color literature on the GD-180,

Circle 15 on Reader Service Card

The FCV-552, for starters, is a top-notch 500W (rms), dual frequency, eight-color video sounder with a high resolution 8-inch CRT.

It can provide, with optional sensor, a historical temperature plot covering the range from 23 to 86° F on the lower third of the CRT. Or, it can interface with onboard loran or sat nav receivers functioning as a video plotter complete with present position, track plot, event marks, present and past waypoints, range/bearing to waypoint, and present time, as well as position, depth, temperature and time data for past waypoints.

In the sounder mode, the FCV-552 provides 19 basic ranges to 3,000 feet, from which the user can preselect any six frequently used scales. Additionally, the unit can be phased in 1- or 10-foot steps across the entire range and there are six selectable bottom lock ranges.

Operators may choose from six different display modes that include any combination of high, low, or mixed frequencies and bottom lock.

The FCV-552 uses a single transducer for both the 50 and 200 kHz operating frequencies. It has internal memory to store a full page of data in any mode, alarms for fish, bottom, midlayer, or temperature, it stores up to 16 events, and operates from a universal 11-40 VDC power supply drawing just 50 W.

Furuno's new FCV-552 has the performance features for complete Fishing Database Management.

For free full-color literature containing full details on the FCV-522,

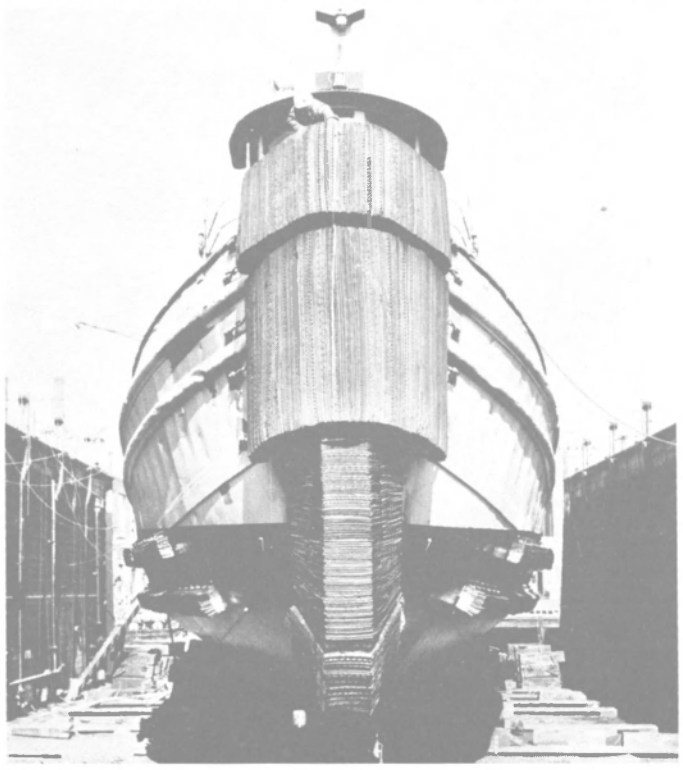
Circle 16 on Reader Service Card

Lys-Line Orders Passenger Liner From Yugoslav Yard

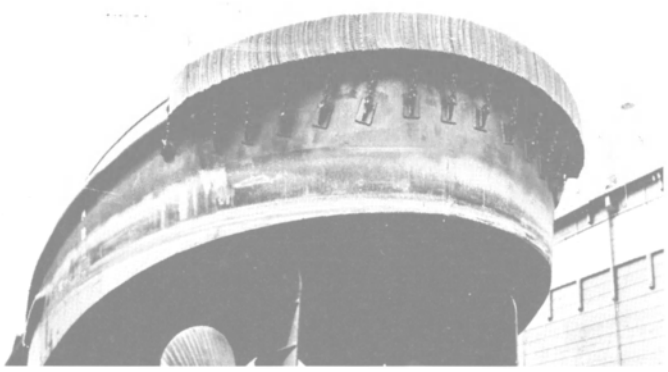
Titovo Brodogradiliste of Kraljeviva, Yugoslavia, has received an order from Lys-Line A/S to construct a 3,400-dwt liner for service between Norway and Ireland.

Under the contract, the vessel is expected to be delivered in late 1989.

DO YOU NEED FENDERS?



U.S. NAVY SUBMARINE HANDLING TUG



MOBIL OIL STERN FENDER

AS USED BY

- ★ U.S. NAVY
- ★ U.S. COASTGUARD
- ★ ARMY CORPS OF ENGINEERS
- ★ REINAUER/BOSTON FUEL
- ★ CHEVRON OIL
- ★ CROWLEY MARITIME
- ★ DILLINGHAM
- ★ EXXON
- ★ FOSS
- ★ G & H TOWING
- ★ McALLISTER
- ★ MOBIL OIL
- ★ MORAN
- ★ PANAMA CANAL CO.
- ★ SPENTONBUSH
- ★ SUN OIL
- ★ TURECAMO

AND MANY OTHERS

OVER THIRTY YEARS OF EXPERIENCE TO SOLVE YOUR PROBLEM

ENGINEERED FENDERING FOR: TUGS, BARGES, SHIPS, PIERS, DOCKS, MOORING DOLPHINS, OIL RIGS, DREDGES, PUSH BOATS, AND ANY OTHER APPLICATION REQUIRING A RESILIANT RUBBER CUSHION.

STANDARDIZED FENDERING: PIGTAILS, STRIP FENDERS, TURKS, HEADS, PUSH KNEES, CYLINDRICAL FENDERS, SIDE FENDERS, AND MORE.

COMPLETE LINE OF WELD-ON FENDERS FOR FISHING TRAWLERS

- PROVIDES HULL PROTECTION FROM TRAWL DOORS
- ELIMINATES DOOR IMPACT NOISE
- EASILY INSTALLED AND COST EFFECTIVE

TRAWL NET DISCS—REDUCES GEAR LOSS BY ALLOWING THE NET TO ROLL OVER OBSTACLES

CALL FOR OUR FREE CATALOGUE

1-800-426-3817

SCHUYLER MANUFACTURING CO.
A Division of Semco

16901 Wood-Red Rd
Woodinville, WA 98072
(206) 488-2255
(800) 426-3917

P.O. Box 87
Staten Island NY 10303
(718) 727-9697

Circle 275 on Reader Service Card

New Solid State Ignition System From Fairbanks Morse—Literature Available

Fairbanks Morse Engine Accessories Operation recently announced the availability of a new solid state ignition system for six- eight- and twelve-cylinder even firing engines.

The 9000RT is an easy starting ignition generator, firing at or before 50 rpm with less than 1½° variation. With its timing provided directly by a signal from the magnet rotor, the magneto fires only on the compression stroke, eliminating spark waste.

Offering high primary output (225 VDC) the 9000RT provides a constant voltage reserve for broader range operating conditions. A wide-band variable timing range allows versatility to accommodate dual fuel engines or other applications requiring two ignition timing settings. The minimum variable timing range for four-cycle engines is 17 crankshaft degrees. On two cycle engines, the minimum range is 13 crankshaft degrees.

With moisture resistant O-rings sealing all mating surfaces, the 9000RT offers long duration spark capability for engines requiring extended spark duration, such as lean burn, high compression engine systems and slow-speed compression engines.

The 9000RT is designed with all of its electronic components located in the end cap, so end cap replacement will not affect the engine or ignition timings.

Available in universal flange or base mount versions, all units feature a two-year warranty and are functionally tested before shipment.

Two vartime control options are available—a preset vartime control and an automatic control. The preset control automatically accommodates two different timing settings. This capability is particularly useful in dual fuel applications. The automatic control accepts a 4-20 mA signal from an engine controller, allowing the 9000RT to automatically and continuously adjust spark timing for optimum performance.

For more information on the 9000RT,

Circle 27 on Reader Service Card

Daewoo Receives $100-Million Order To Build Two Tankers

Daewoo Shipbuilding & Machinery Ltd. of South Korea recently received a $100-million order from the Gotaas-Larsen Shipping Corporation for the construction of two 280,000-dwt crude oil tankers.

The ships, which will measure 1,075 feet long with a breadth of 189 feet, are expected to be delivered during 1989.

HHI Exports Full Design Package For Crude Carrier To Portuguese Shipyard

Hyundai Heavy Industries Co., Ltd. (HHI) of Korea recently announced that, under an agreement concluded with the Danish ship design company Burmeister & Wain Shipdesign Aps (BWS), it is providing the Portuguese shipyard Setenave with a complete design package, including all design documentation, related technical and engineering information, to construct and outfit an 88,900-dwt crude carrier.

BWS, who was originally involved in the development of the above ship design with HHI, is currently acting as HHI's counterpart on behalf of Setenave. Under the agreement, BWS is to supervise and provide a design to Setenave, which won a contract from Soponata last year to build one-plus-optional-one 88,900-dwt crude carrier.

The complete set of drawings which HHI is providing is based on the design of its Hull No. 349 (the 88,900-dwt crude carrier Golden Fleece delivered to Argonaut AB of Sweden in 1985) incorporating various requirements of the Portuguese project.

HHI reports that its technological capabilities can be largely attributed to its continued, strategic investment in R&D activities.

For free literature giving full details on HHI,

Circle 59 on Reader Service Card

COMSAT Maritime has every signal you need, including worldwide packet data and electronic mail service.

Before you finalize your ship-to-shore communications system, call us with your data communication requirements. Because our interconnecting capability with worldwide packet data networks, which is now operational, is only the beginning of our long list of onboard services.

Once your ship is equipped with an INMARSAT ship earth station, you can have a variety of shipboard communications that rival anything available on shore: our new land/sea electronic mailbox service, Telex and facsimile, up to the minute weather forecasts, credit card telephone calls to any phone in the world, daily news reports, live radio, a television video news service and even electronic banking.

With the communications package that only COMSAT Maritime Services can provide, you can connect to any telephone or computer on shore. So it will be smoother sailing for you, your crew and your passengers.

For more information on any COMSAT Maritime Service, or a free registry number and instructions for your own electronic mailbox, call or write Bob Eichberg, Vice President of Marketing.

COMSAT
Maritime Services

22300 COMSAT Drive Clarksburg, MD 20871. 1-800-424-9152

Circle 310 on Reader Service Card

OUTSTANDING OCEANGOING SHIPS OF 1987

This feature is a roundup of some of the most notable oceangoing ships of 1987. The editorial staff of MR/EN has selected these vessels for their outstanding design features, excellent fuel efficiency, noteworthy performance and versatile service characteristics.

Besides entries from the commercial sector, this year's feature also incorporates some special Navy ship designs.

AMERICANA
Hyundai

In November, Hyundai Heavy Industries' Ulsan Shipyard in Korea delivered the new concept container/passenger (CONPASS) carrier Americana to her owner A/S Ivarans Rederie of Norway. The vessel has a container capacity of 1,120 TEUs and passenger capacity of 110.

This CONPASS carrier is virtually a new concept in the present market, and A/S Ivarans Rederie, a cross trader on the Atlantic, is conducting what many believe to be a novel experiment with the introduction of the vessel onto its North American East Coast-South American East Coast service.

Powered by a direct-coupled, slow-speed, two-stroke Hyundai-B&W 7S60MC diesel developing 14,280 bhp, the 580-foot-long vessel has a service speed of 18.2 knots. She has a breadth of 85 feet and a design draft of 29 feet.

The Americana is "double skinned" with her cargo space divided into six individual holds by transverse bulkheads. Additionally, she has three vegetable oil tanks, as well as three deep fuel oil tanks.

For efficient cargo handling, the Americana has two sets of 36-ton-capacity, electrohydraulic Tsuji deck cranes on fixed foundation columns on her upper deck.

For her passengers, the Americana features first class accommodations with 62 double and single cabins. She is equipped with a lounge/bar, dining saloon, library, swimming pool, whirlpool, deck bar, health club, shop and hair salon.

Since Hyundai used the latest design and construction techniques in building the Americana, both passenger and crew accomodation areas are quiet and vibration free.

Photos above clockwise from top left: Celebration, Kockums; Key West (SSN-722), Newport News Shipbuilding; Kronprins Harald, Wartsila; Exxon Long Beach, NASSCO; Repubblica di Venezia, Fincantieri.

AMERICANA
Equipment List

Main engine	Hyundai-MAN B&W
Propeller and tail shaft	Liaan
Steering gear	Frydenbo
Bow thruster	Liaan
Diesel generator engine	Ssangyong-MAN B&W
Composite boiler	Aalborg
Motor control gear	Hyundai-Terasaki
Automation & monitoring system	Norcontrol
Alternator	Hyundai-Siemens
Main switchboard	Hyundai-Terasaki
SatCom	EB
Gyrocompass and autopilot	Robertson
Telephone	LM Ericsson
Radio equipment	EB
Purifier	Nagase-Alfa
Centrifugal pump	Shinko
Cargo pumps	Framo
A/C plant	Novenco
Refrigeration machine	Sabroe
Remote control valves and control system	Amri
Tank cleaning machine	Gunclean
CO_2 system	Unitor
Vacuum sewage system	Evac
Cargo hatch covers	Kayaba (MacGregor Navire)-Hyundai
Deck crane	Tsuji
Deck machinery	Hyundai-Norwinch
Container fitting	Peck & Hale
GRP pipe	Vetroresina
Bulkhead & lining	TNF
Ceiling	Dampa
Passenger lighting fixtures	Glamax
Galley equipment	Electrolux
Life and rescue boats	Harding
Portable gas free fan	Yamamitsu
Paint	Chokwang-Jotun
Cathodic protection	Electrocatalytic

ANDREW J. HIGGINS
Avondale

The U.S. Navy fleet oiler Andrew J. Higgins (T-AO-190), the fourth in a series of six vessels of this type, was delivered in the late third quarter of this year by Avondale Industries, Inc.'s Shipyards Division, New Orleans, La.

Built with the use of modern modular construction techniques, the Andrew J. Higgins is 667½ feet long with a beam of 97½ feet and maximum draft of 36 feet. Her main propulsion consists of two 10-cylinder PC4.2 Colt-Pielstick diesel engines manufactured by the Fairbanks Morse Engine Division of Colt Industries Inc. These are the first diesel propulsion engines for this class vessel built in the U.S. The engines are capable of burning heavy fuels of up to 3,500 sec Redwood at 100°F. The fuel rate guarantee is 136 grams/metric horsepower hour. The twin-screw design provides the T-AOs with improved

directional stability, ease of control and mission reliability. The oiler is capable of speeds of 20 knots. The ship's engines reportedly represent the largest marine diesels currently being manufactured in the U.S.

The mission of the Andrew J. Higgins and other ships of the T-AO-184 Class is to transport bulk products and fuel from shore depots to combatants and support forces underway. The ships also deliver limited fleet freight, cargo, water, mail and personnel. The new ship has a cargo capacity of 183,500 barrels of oil in 18 cargo tanks and is capable of simultaneously receiving, storing and discharging two separate grades of cargo fuel. All cargo valve and pump operations and the ship's segregated ballast system are manipulated from the cargo control center located in the ship's aft superstructure, which has an overview of the entire underway replenishment deck. Cargo underway replenishment is accomplished using transfer rigs with transfer hoses suspended by a span wire automatically maintained in a constant-tension range. T-AO Class vessels are also capable of refueling helicopters from a vertical replenishment facility aft of the accommodation house.

ANDREW J. HIGGINS
Equipment List

Main engines	Colt
CP propellers	Bird-Johnson
Reduction gears	Cincinnati Gear
CRP package	Bird-Johnson
Shafting	Bird-Johnson
Line shaft bearings	Avondale
Ships service generators	Alco
Emer. generators	Energy Power
PTO generators	Cogenel
ME & PTO clutch coupling	Eaton
Main switchboards and group control centers	Federal Pacific
Bridge control console, engine room control console & cargo control console	TANO
Steering gear	Jered Brown Bros.
Replenishment-At-Sea & deck equipment	Lake Shore
Anchor windlass	Lake Shore
Compass	Sperry
Radars	Precision Marine
RAM tensioner	Western Gear
HP air compressor	Ingersoll Rand
Ships service air compressor	Ingersoll Rand
F/O & L/O purifiers	Centrico
Incinerator	Atlas Danmark
Distiller	Aqua-Chem
Boiler	Clayton
Valve actuators	Limitorque
A/C plant	Carrier Transicold
Joiner work	Hopeman Bros.
Sewage treatment unit	Red Fox
Vacuum collection system	Envirovac
Firefighting system	Hiller
Windows	Kearfott
Elevator	Unidynamics
Hull paint	International
Tank paint	Mobil
Cathodic protection	Electrocatalytic

ATLANTIC AMERICAN
McDermott

The 7,787-dwt split-hull hopper dredge Atlantic American was delivered during the fall of this year by McDermott Shipyard, New Orleans, La., to the American Dredging Company by Camden, N.J.

The trailing dredge, with a hopper capacity of 4,000 cubic yards, will be used to deepen, maintain, and improve waterways. The 294-foot, self-propelled, diesel-electric dredge will accommodate a crew of 21 and have an American Bureau of Shipping Maltese Cross A-1 Ocean Service classification—unattended automated engine room. The vessel, which has a molded breadth of 54 feet and a depth of 22 feet, can

(continued)

Photo right: Americana

Gurupi

Marine Reliance

Mercandian Pacific II

Vasa 12V22HF, each with a capacity of 1,770 kw.

When designing the engines, the main dimensions and the hull form, special attention was given to the total fuel consumption. The new vessel uses the same amount of fuel during a tour (Oslo-Kiel-Oslo) as the old Kronprins Harald, even though the gross tonnage is about 50 percent higher.

The passenger areas of the new ferry comprise 468 cabins with a total of 1,440 berths. Special attention was given to the sound insulation of the cabins. The vessel has a trailer deck, a cargo room for trailers, and a private car deck above the trailer deck. The maximum number of trailers she can hold is 54, while her No. 4 deck can hold 283 cars.

MARINE RELIANCE
Sumitomo

In late June of this year, Sumitomo Heavy Industries, Ltd.'s Oppama Shipyard delivered what reportedly was the first U.S.-flag Pure Car Carrier (PCC), the Marine Reliance, to a U.S. shipping company, Marine Transport Lines, Inc.

Powered by a Sumitomo-Sulzer 7RTA52 diesel engine with a maximum continuous rating of 11,700 bhp at 122 rpm, the Marine Reliance is designed to carry over 4,000 automobiles.

With a gross tonnage of 35,750 mt, the Marine Reliance has an overall length of 571 feet, molded breadth of 98 feet and molded design draft of 27 feet. Her service speed is 18 knots.

The Marine Reliance is currently engaged in two-way trade between the U.S. and Japan carry Nissan cars. On her maiden voyage earlier this year, she delivered 4,000 Nissan cars from Japan to the Port of Newark, N.J.

MARINE RELIANCE
Equipment List

Main engine	Sumitomo-Sulzer
Propeller	Kobe Steel
Shaft	Sumitomo
Generator	Nishishiba
Boiler	MHI
Steering gear	MHI
Auxiliary diesel engine	Daihatsu
Air reservoir	Sanwa Iron Works
Oil heater	Gadelius
Shipboard auto/remote control system	Terasaki

MERCANDIAN PACIFIC II
Danyard

During the second quarter of 1987, Danyard A/S of Fredrikshavn, Denmark, delivered the Mercandian Pacific II, the first in a series of four roll-on/roll-off (RO/RO) ships for the Mercandia Shipping Group. The new vessel, which is chartered to Vencaribe, Caracas, is the largest vessel built at the Fredrikshavn yard to date.

The Mercandian Pacific II, which was renamed the Caracas just prior to her departure from Fredrikshavn, was constructed in two parts that were subsequently joined after launching.

The 14,000-dwt vessel, the largest ship so far in the Mercandia Shipping fleet, has an overall length of 537½ feet, with a molded breadth of 77 feet and scantling draft of 29 feet. The total trailer length of the ship is about 9,186 feet and container capacity is 725 TEUs.

The vessel is powered by a single six-cylinder medium-speed MaK 6M 601 diesel developing 9,000 bhp and driving a Lips CP propeller at 118 rpm through a Reintjes single reduction gear. A speed of 17.5 knots was obtained in trials. The machinery is approved for unmanned operation. The engine, which is arranged to run on heavy fuel, also drives a shaft generator to meet all the ship's power requirements at sea. Powerful Lips transverse thrusters at both bow and stern ensure good shiphandling characteristics without the need for tug assistance.

MERCANDIAN PACIFIC II
Equipment List

Main engine	MaK
Reduction gear	Reintjes
Auxiliary engine	MaK/Reliance
Propeller	Lips
Emergency generator	Mercedes-Benz
Bow & stern thrusters	Lips
Pumps	Svanehoj
Separators	Alfa-Laval
Radar	Raytheon
Freshwater generator	Atlas
Main control system and gyro	Anschutz
Hydraulic deck machinery	Motorfabrikken
Steering gear	Frydenbo
Ramps, bulkhead doors and hatch covers	MacGregor Navire
A/C and ventilation systems	Novenco
Radio	International Skibs Radio
Switchboards	B.E. Automatik

The Kriti Color, built by Brodosplit

The vessel is classified +1A1, General Cargo/Container/Car Carrier, RO/RO, EO by Det norske Veritas.

NORDFARER
Burmeister & Wain

The product/crude tanker Nordfarer was delivered in the first quarter of this year by Burmeister & Wain Skibsvaerft A/S of Copenhagen, Denmark, to her owners, Ugland-Norden. She joined four sister ships in the Ugland-Norden pool, which are engaged in the carriage of naptha, gasoline and aviation fuels.

NORDFARER
Equipment List

Main engine	MAN B&W
Auxiliary engines	MAN B&W Holeby
Generators	BBC Nordisk Brown Boveri
Elec. motors	Stromberg
Steering gear	Porsgrunn
Radars	Kelvin Hughes
Gyro/autopilot	Sperry
Radio station	Dansk Radio
Bridge maneuvering system and alarm system	Soren T. Lynges
Remote sounding	Autronica
Boilers	Aalborg Marine
Purifiers	Alfa-Laval Zeta
Cooling water pumps	Desmi
Cargo oil pumps	Frank Mohn
Fire-extinguishing equipment	Ginge-Kerr
Windlass and mooring	Pusnes
Hose-handling cranes	MTT
Deck pipelines	Monberg & Thorsen
Lifeboats	Fr. Fassmer
Paints	International Farvefabrik
Painting of tanks	Nika
Ballast tank painting	Ole Dufour

The Nordfarer has an overall length of 750 feet, moulded breadth of 106 and a design draft of 38 feet. She is powered by a five-cylinder, two-stroke MAN B&W L70MCE diesel engine, which develops 10,900 bhp at 84 rpm. The engine drives a four-bladed propeller with a diameter of 23½ feet.

The Nordfarer is a completely new Burmeister & Wain-designed medium-sized product tanker, a 54,000/84,000-dwt product/crude tanker, the CPT54E type, which has a capacity of 91,000 cubic meters.

With the delivery of three of these ships last year, B&W achieved a share of 20 percent of the 1986 newbuilding market for medium-sized product tankers.

The CPT54E can carry 50,000 tons of cargo at 13 knots on about 20 ts/day (including 50 percent sea margin). The clean tanks of the ship—no stiffeners or heating coils and double-skinned hull all round—together with stainless steel pipes, deep-well pumps and epoxy coatings, give the vessel the flexibility needed to work in the emerging product trades, especially those derived from source-located export refineries.

In the CPT54E type tanker, the ship is designed so that cargo is completely discharged from tanks, pumps, pipes and valves. All cargo piping systems have the means to blow the lines, and to drain the contents into slop tanks, to shore or back to the cargo tanks.

The vessel can handle and carry up to 14 different cargoes. The cargo is controlled by a loading computer, with automatic readings of cargo levels and temperatures.

NORSUN
NKK

Nippon Kokan Kaisha (NKK) of Tokyo, Japan, delivered the passenger/car ferry Norsun to her owners, Hollandse Vrachtvaart Maatschappij, early in the second quarter of this year.

The Norsun has a length of 588 feet, breadth of about 83 feet and draft of 20 feet. She is powered by four Wartsila-Sulzer ZAL40 medium-speed engines, producing 26,100 bhp in a "father and son" arrangement.

The 31,000-grt Norsun is capable of carrying up to 1,250 passengers, 850 cars and 590-foot by 40-foot trailers or unit loads. She is equipped with cargo access equipment designed by Kvaerner Ships Equipment AB of Gothenburg, Sweden, and supplied by MGFE, a Kvaerner co-operation partner in Japan.

Operating on the North Seas Ferries overnight route between Hull, U.K. and Rotterdam, Holland, the Norsun features several major technical advances, including a fuller-than-usual hull form—dictated by a need for extra freight space but with contraints imposed by the limitations of the Port of Hull's lock system. With the current trends for improved fuel efficiency, the form was developed around the need to accommodate what are reported to be the largest propellers possible within this type of arrangement. The propellers were supplied by KaMeWa.

The Norsun arrived in Amsterdam at the beginning of May from Japan with 800 Nissan cars. Her maiden voyage with passengers took place on May 12 from Rotterdam.

NORSUN
Equipment List

Main engines	Wartsila-Sulzer
CP propeller	KaMeWa
Generator	Taiyo Electric
Thermal boiler	Saarloos
Stern tube bearing	Kobe Steel
Steering gear	Mitsubishi
Gyro	Anschuetz
Radar	Selesmar
Radio	Sait
Windmeter	Vaisala
Cargo access equipment	MGFE

PANDA
3. Maj

The Rijeka Shipyard of 3. Maj Shipbuilding delivered the 83,700-dwt oil tanker/chemical carrier Panda to her owners, the East Asiatic Company of Denmark, during the third quarter of this year.

The Panda is intended for the carriage of crude oil, oil products

(continued)

and chemicals. She was constructed in accordance with the rules of Det norske Veritas for the class + 1A1 Tanker for Oil (Cow, Inert) EO bis Tanker for Chemicals.

Launched on March 24th of this year, the Panda is 748½ feet long, has a molded breadth of 105½ feet and a design draft of 41 feet. She is powered by a 3. Maj-Sulzer 6RTA62, super-charged, single-acting, two-stroke diesel engine, which is directly coupled to a fixed-pitch propeller. The engine has a maximum continuous rating of 8,330 kw at 85 rpm. Her service speed is 14 knots at her design draft at 90 percent of mcr and 15 percent sea margin.

The Panda has extremely flexible and extensive loading capability, which is achieved through the use of deep-well pumps installed in each of her cargo tanks. Additionally, her uncluttered cargo tanks keep cleaning time to a minimum, reducing both labor costs and time.

PRESIDENT GARFIELD
Mitsui

During the first quarter of this year, the 44,966-dwt containership President Garfield was delivered by Mitsui Engineering & Shipbuilding Co., Ltd.'s Tamano Works to Lykes Bros. Steamship Co., Inc. Mitsui also delivered the President Arthur and President Buchanan, sister ships of the Garfield, to Lykes Bros. The three 3,025 TEU containerships, along with the sister ship President Harding built by Mitsubishi, are all under long term charter to American President Lines.

The Panda built by 3. Maj.

The 39,132-gt President Garfield has an overall length of 849½ feet, breadth of 106 feet and full load draft of 39 feet.

Her main propulsion engine is a Mitsui-MAN B&W 9L80MCE diesel with a maximum continuous rating of 28,800 bhp at 83 rpm. On her sea trials, the President Garfield obtained a speed of more than 23 knots.

One of the advantages offered by the President Garfield, as well as her sister ships, is that containers can be stowed on her upper deck above the engine room, increasing container capacity.

Other advantages offered by the President Garfield's design include: the addition of cell guides on the upper deck (where hatch covers are absent above the engine room and steering gear room) for efficient cargo handling; a manually operated side port door on the starboard side of the engine affords easy access for loading supplies on board; and a duct keel is arranged within her double bottom tank to facilitate maintenance and inspection of piping and valves inside the double bottom.

The ABS-classed President Garfield carries a maximum complement of 42.

PRESIDENT GARFIELD
Equipment List

Main engine	Mitsui-MAN B&W
Propeller	Kobe Steel
Shaft	Kobe Steel
Generator	Shinko/Siemens
Boiler	MHI
Steering gear	MHI
Auxiliary diesel engine	Daihatsu
Generator turbine	MHI
Air reservoir	Sanwa Iron Works
Oil heater	Gadelius
Shipboard auto/remote control system	Nippon Air Brake/ Nunotani Keiki/ Mitsui/ Terasaki
Cathodic protection	Electrocatalytic

REPUBBLICA DI VENEZIA
Fincantieri

The multipurpose roll-on/roll-off

(RO/RO) vessel Repubblica Di Venezia was delivered during the third quarter of this year by the Marghera Shipyard of Fincantieri to the Grimaldi Group. She has a capacity of 4,000 medium-sized automobiles or about 950 TEUs.

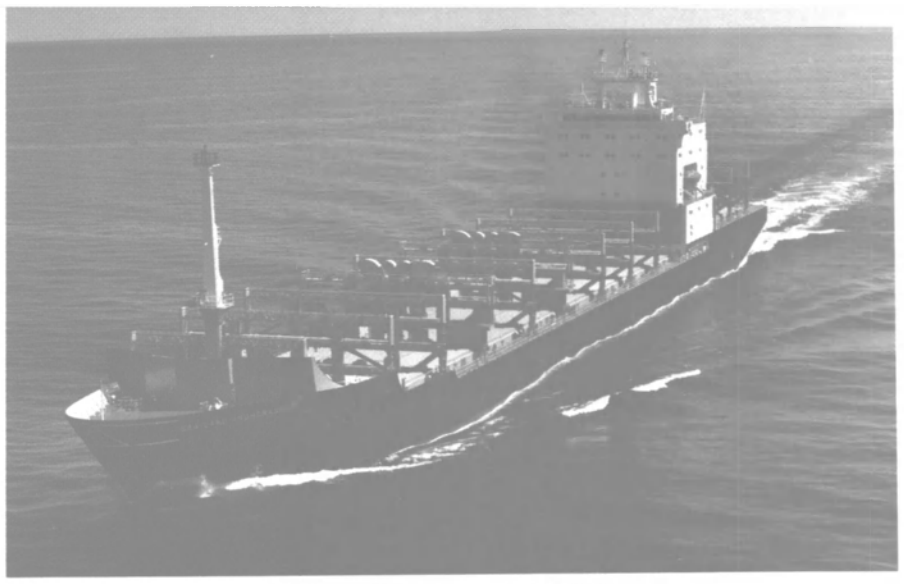
The Repubblica Di Venezia has a length between perpendiculars of 541 feet, a molded breath of 100 feet, and a design draft of 24½ feet. Her propulsion plant consists of a Fincantieri GMT-Sulzer diesel engine with a maximum continuous rating of 17,280 bhp at 127 rpm turning a controllable-pitch propeller of Ni-Al bronze. In addition to three Fincantieri GMT-type diesel-driven generators, she is equipped with shaft-driven and emergency diesel-driven generators. Propulsion machinery control is automatic from the bridge with unmanned central control station arranged in the machinery space.

Designed to offer an operative flexibility for different types of cargo along with accommodating 56 passengers in cabins, the vessel has a quarter stern ramp-door, arranged at approximately 39 degrees to allow access from a lateral quay and through a door located aft. The single-propeller type ship, with engine arranged aft, has transversal watertight bulkheads and two longitudinal bulkheads in order to fulfill the compartmentation requirements for passenger and cargo vessels. Classification is Registro Italiano Navale/ American Bureau of Shipping.

At present, the RO/RO is being employed in the Brazilian/Mediterranean to carry cars, containers and various heavy rolling cargo.

REPUBBLICA DI VENEZIA
Equipment List

Main engine	GMT-Sulzer
Propeller	Depretto-Escher Wyss
Shafting	Fincantieri-CNI
Generators	Ansaldo Motori
Boilers	Michele Saporiti/ Casinghini
Stern tube bearing	HDW
Steering gear	Frydenbo
Magnetic compass	Cassens & Plath
Gyrocompass	Anschuetz
Autopilot	Anschuetz
Radar	Krupp Atlas
Direction finder	Taiyo
Echo sounder	Krupp Atlas
Speedmeter	Sacem
Speedmeter doppler	Krupp Atlas
Autopilot radar	Krupp Atlas
Radio antenna	Eltamar
TV antenna	Eltamar
P/A system	Gitiesse Girotecnica
Radio station	ITT
Auto. phone	Gitiesse Girotecnica
Magnetophonic telephones	Gitiesse Girotecnica
SatCom	EB Hoechst
Plotting device	Anschuetz
SatNav	Racal Decca
Anemometer	Thies



Sea-Land Anchorage, Bay Shipbuilding

Wasp (LHD-1) Ingalls Photo

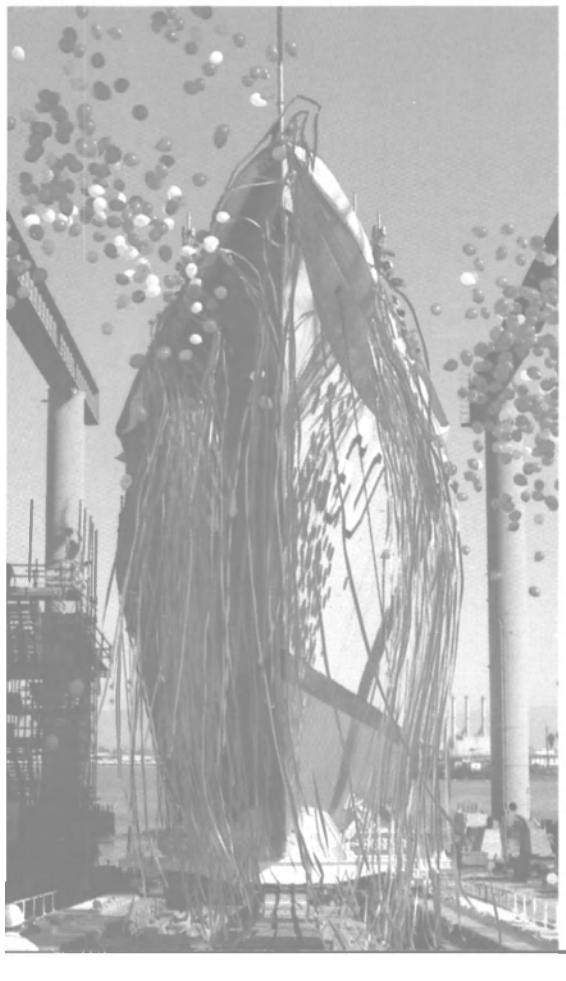
RODNEY M. DAVIS
Todd Pacific

The Aegis guided-missile frigate Rodney M. Davis (FFG-60) was commissioned by the Navy at the U.S. Naval Station in Long Beach, Calif., early in May of this year. The frigate was built by Todd Pacific Shipyards' San Pedro yard.

The Oliver Hazard Perry Class frigate is 453 feet long, with a beam of 45 feet and a navigational draft of 24½ feet. She has a full load displacement of about 3,900 tons, and is powered by two GE LM-2500 marine gas turbine engines. She is able to reach speeds of more than 28 knots.

Manned by a crew of 152 enlisted men and 11 officers, the Rodney M. Davis's primary mission, as well as her sister ships of the Oliver Hazard Perry Class, is to serve as an ocean escort with amphibious task forces, underway replenishment groups and convoys. She is equipped with surface-to-air and surface-to-surface missile systems, torpedoes and a 76-mm gun. The frigate is also equipped to operate two antisubmarine helicopters, which extend both her attack range and over-the-horizon detection capability.

Rodney M. Davis



SEA-LAND ANCHORAGE
Bay Shipbuilding

The 710-foot containership Sea-Land Anchorage was delivered in September by Bay Shipbuilding

(continued)

Corporation, Sturgeon Bay, Wis., to her owners, Sea-Land Service. She is the first of three sister vessels to be delivered this year by Bay Shipbuilding.

The Anchorage is powered by a slow-speed 7L70MC MAN B&W diesel engine supplied by Mitsui Engineering and Shipbuilding Co., Ltd., which drives a Kawasaki controllable pitch propeller. The fuel efficient seven-cylinder engine is capable of developing over 22,000 bhp. The vessel has a beam of 78 feet and design draft of 30 feet.

The ship's propulsion plant is designed to operate unattended ACCU, and all plant functions are monitored by Siemens computer automation equipment. Electrical power to the ship is provided through two Wartsila main AC diesel generators, each rated at 2,000 kw and two Wartsila auxiliary diesel generators rated at 1,000 kw each. An emergency diesel generator is also provided by Caterpillar.

The Sea-Land Anchorage will be capable of carying over 700 FEU containers of cargo. The ship, which has seven cargo holds, also has the capacity to carry a variety of refrigerated containers in specially equipped cargo holds and at designated areas above deck. The ship is capable of carrying 20-, 35- or 40-foot containers. To facilitate the storage and securing of containers above deck, the ship is equipped with stacking towers and hydraulically operated hinged frames which rotate from a vertical to horizontal position, securely locking in each layer of containers quickly.

The ship is specially strengthened to serve in Alaska's severe weather. The forecastle has a substantial breakwater built to protect the forward containers. Deck machinery is enclosed from the weather at the bow and at stern, providing a weathertight closure for the mooring of

OUTSTANDING OCEANGOING SHIPS 1987

VESSEL	TYPE	DIMENSIONS Overall Lgth-Wdth-Dft (feet)	TONNAGE	MAIN ENGINES	OWNER	BUILDER	DELIVERY
Americana	ConPass	580x85x29	17,300 dwt	MAN B&W-Hyundai	Ivarans Rederi	Hyundai	10/87
Andrew J. Higgins, (T-AO-190)	Oiler	667½x97½x36	42,000 lt	Colt-Pielstick	U.S. Navy	Avondale	10/87
Atlantic American	Split-Hull Dredge	294x54x19½	3,104 grt 7,787 dwt	Niigata & Schottel Thrusters[1]	American Dredging	McDermott	9/87
Celebration	Cruise Liner	733x92x24½	47,262 grt	Sulzer	Carnival Cruise	Kockums	3/87
Cosmo Jupiter	VLCC	1,049x177x63	135,525 grt 238,770 dwt	MAN B&W-Hitachi	Shinwa kaiun kaisha	Hitachi Zosen	12/86
Exxon Long Beach	Tanker	987x166x64½	95,000 gt 209,200 dwt	Sulzer	Exxon Shipping	NASSCO	4/87
Gurupi	Gas Tanker	439x62½x27½	8,000 grt 8,900 dwt	MAN B&W	Petrobras	Meyer Werft	7/87
Jasmine	Bulk Carrier	954½x157x59	93,000 grt 188,100 dwt	MAN B&W	Korea Shipping	Samsung	9/87
Key West, (SSN-722)	Submarine	362x33	6,062 t	?	U.S. Navy	Newport News	9/87
Kriti Color	Tanker	638x105x37	45,305 dwt	MAN B&W-Split	Kriti Color Shipping	Brodosplit	2/87[2]
Kronprins Harald	Ferry	545x93x21	31,122 gt	Sulzer-Wartsila	I/S Jahre Line	Wartsila	3/87
Marine Reliance	PCC	571x98x27	11,315 grt	Sulzer-Sumitomo	Marine Transport Lines	Sumitomo	6/87
Mercandian Pacific II	RO/RO	537½x77	14,000 dwt	MaK	Mercandia Shipping	Danyard	6/87
Nordfarer	Product Tanker	750x106x38	54,000-84,000 dwt	MAN B&W	Ugland-Norden	Burmeister & Wain	3/87
Norsun	PassCar Ferry	588x83x20	31,598 grt	Sulzer-Wartsila	Hollandse Vrachtvaart Maatschappij	Nippon Kokan	3/87
Panda	Oil/Chemical Tanker	748½x105½x41	83,700 dwt	3. Maj-Sulzer	East Asiatic Co.	3. Maj	3/87[2]
President Garfield	Cntrship	849½x106x39	39,132 gt	MAN B&W-Mitsui	Lykes Bros.	Mitsui	3/87
Repubblica Di Venezia	RO/RO	541x100x24½	11,500 dwt	GMT-Sulzer	Grimaldi Group	Fincantieri	6/87
Rodney M. Davis, (FFG-60)	Frigate	453x45	3,900 t	GE Gas Turbines	U.S. Navy	Todd	5/87[5]
Sea-Land Anchorage	Cntrship	710x78x30	19,311 gt	MAN B&W-Mitsui	Sea-Land	Bay Ship	7/87
Sovereign of the Seas	Cruise Liner	874x106x25	74,000 grt	Pielstick	Royal Caribbean Cruise Line	Alsthom Chantiers de l'Atlantique	12/87
Transshelf	Hvylft Vessel	569x131x29[3]	26,547 gt	Wartsila-Vasa	Sudoimport	Wartsila	3/87
Wasp (LHD-1)	Amphib. Assault Ship	844x106	40,500 t	Westinghouse Steam Turbines	U.S. Navy	Ingalls	9/87[4]
Yamataka Maru	Cntrship	754x106	42,145 gt	MAN B&W-Hitachi	Yamashita Shinnihon Steamship	Hitachi Zosen	10/86

1.—Six Caterpillar main generators; 2.—Launching date; 3.—Draft to summer load line; 4.—Christening date. Delivery is expected in 3/89; 5.—Commissioning date.

the ship. The ship is also equipped with Omnithruster bow and stern thrusters which greatly enhance its maneuverability.

SEA-LAND ANCHORAGE
Equipment List

Main engine	MAN B&W/Mitsui
Main & auxiliary generators	Wartsila
Emergency generator	Caterpillar
Boilers	Aalborg Vaerft
Bow & stern thrusters	Omnithruster
Automation	Siemens
Propeller & shaft	Kawasaki
Stern tube bearings & seal	Kobe Steel
Steering gear	AEG/Mitsui
Navigation equipment	ITT/Mackay
Gyrocompass	Sperry
F/O pumps	Taiko Kikai
Purifiers	Alfa Laval
F/O heaters	Gadelius
Seawater pumps	Shinkoh Kinzoku
Tank gauging	Metritape
Fans	Buffalo Forge
HVAC & refrigeration	Bassett
Hatch cover & towers	Manitowoc Ship
Deck covering	Masse
Stores crane & davit	Schat Davit
Winches & windlass	IHI
Marine growth prevention system	Electrocatalytic
Survival craft	Watercraft America
Pilothouse windows	Singer-Kearfott
Deckhouse windows	Winel of America
Fire detection system	Hiller
Foam system	National Foam
Galley & pantry	Kiefer
Sewage treatment unit	Sasakura Kikai
Ballast crete	Genstar Stone
Coatings	Devoe
Cathodic protection	Electrocatalytic

SOVEREIGN OF THE SEAS
Chantiers de l'Atlantique

With her anticipated delivery to Royal Caribbean Cruise Line on December 23, the 74,000-grt luxury liner Sovereign of the Seas will become the world's largest cruise ship.

Built by Alsthom's Chantiers de l'Atlantique shipyard in St. Nazaire, France, the Sovereign is 874 feet long, 106 feet wide and has a draft of 25 feet. She will be able to carry more than 2,600 passengers on 14 decks in her 722 outside and 416 inside staterooms, and will be complemented by a crew of 750 officers, deck, engine and international hotel personnel.

Powered by four nine-cylinder 7,425-hp Pielstick diesel engines, she is able to obtain speeds of more than 21 knots. The Sovereign features two 1,500-hp KaMeWa bowthrusters and Willi Becker rudders for maneuverability. Sperry stabilizers, a Vibrachoc main engine silencer and Rockment cabin partitioning and bulkheads add to passenger and crew comfort.

The liner features a wide array of technologically advanced electronic equipment and systems, including: a Racal Decca MNS 2000 integrated nautical system; Taiyo TF 733 facsimile receiver; Atlas radars; Anschuetz gyrocompass, autopilot and magnetic compass; Norcontrol engine room automation; KaMeWa propulsion machinery remote control; and Flakt Marine heating/air conditioning plants.

The ship's service electrical power is supplied by six Wartsila auxiliary generators, producing 13,000 watts.

Other equipment featured will include Alfa-Laval evaporator and lube/fuel oil centrifugal separator systems and an EVAC sewage system.

A unique feature of the new luxury liner is the Centrum, a central lobby area spanning a height of five decks. The Centrum is highlighted by glass-wall elevators, sweeping staircases, fountains and plants. The Centrum connects many of the ship's public rooms, including the shopping area, lounges, bars, conference center and cafe.

In all, the Sovereign offers two 650-passenger restaurants, six lounges, 16 shops, one casino and two pools.

SOVEREIGN OF THE SEAS
Equipment List

Main engines	Pielstick
Generator engines	Wartsila
Generators	Wartsila
6.6 kV motors	CGEE Alsthom
Line shaft bearings	Renk
Line shaft	A. Johnson
Bowthrusters	KaMeWa
Steering gear	Porsgrunn Staland Maskin
Rudders	Willi Becker
Stabilizers	Sperry
Engine room automation	Norcontrol
Remote gaging	Auxitrol
Propulsion machinery remote control	KaMeWa
Stern tube packing	Waukesha/Lips
M.E. silencer	Vibrachoc
LO/FO separator	Alfa-Laval

(continued)

Emer. alternators, transformers, & main and emer. switchboards	Alsthom
Integrated nautical equipment	Racal Decca
Radars	Atlas
Anemometer, aerovane, & depth sounder	CRM
Facsimile receiver	Taiyo
Gyrocompass, autopilot & magnetic compass	Anschuetz
Radio direction finder & doppler log	OCEL
Battery	SAFT
Automatic telephones	Jeumont Schneider
Fluorescent lamps	Philips
Heating, ventilation & air conditioning plants	Flakt
Air coolers, piping & accessories	York
Refrigerator cooling plant	York
Evaporators	Alfa-Laval
Displacement pump	SCAM-IMO
Centrifugal pumps	A. Johnson
Heeling & reciprocating pumps	Iron
Valves & fittings	Coyard
Starting air compressor	Sperre Mek
O/W separator	St. Louis Ship
Sound signal equipment	Kockums
Auxiliary boiler	Vapor Fluidoternus
Garbage handling & incinerator	Norsk Hydro
Sewage treatment units	SAAB Tank
Sanitary vacuum system	EVAC
Passenger sanitary units	Resine Armee
Crew sanitary units	E. Modul
Shell doors	MacGregor
Watertight doors	Schoenrock Hydraulic
Davits	Schat Davit
Fairleads	Sambre & Meuse
Accommodation ladder	Metalu
Medical equipment	Unitor
Laundry equipment	EDCO
Galley/pantry erection	Sea King
Galley/pantry equipment	Sea King
Bulkheads & cabin partitioning	Rockment
Ceilings	Danacoustic
Windows	Dalmas
Cabin doors	Compin
Fire doors	Saajos
Halon & foam systems	SEPCI
Firefighting gear	Unitor

TRANSSHELF
Wärtsilä

The Turku Shipyard of Wartsila Marine Industries, Inc. of Finland, delivered the 567-foot, heavylift vessel Transshelf to her Soviet owner, V/O Sudoimport, during the end of the first quarter of this year.

The Transshelf is powered by two Wartsila-Vasa 18V32 type engines with an output of 6,750 kw each. The engines are connected by Valmet Rautpohja reduction gears to two Escher Wyss controllable-pitch propellers.

Electric power generation is provided by two Stromberg shaft generators and two Wartsila Vasa 4R22HF auxiliary engines.

The heavylift vessel can lift and

(continued)

TRANSSHELF
Equipment List

Main engines	Wärtsilä-Vasa
Reduction gears	Valmet Rautpohja
Main couplings	Lohmann & Stolterfoht
PTO couplings	Vulkan
Shaft generators	Stromberg
Auxiliary engines	Wartsila-Vasa
Auxiliary alternators	Stromberg
Emerg. diesel aggregate & emerg. alternator	SNTL
CP propellers	Escher Wyss
Prop nozzles	Hollming
Bowthrusters	KaMeWa
Bowthruster motors	ASEA
Exhaust gas boilers	Kymi-Strömberg
Lighting transformers	SNTL
Echo sounder, log, speed indicator, radars, anticollision device, gyrocompass, radio directionfinder, magnetic compass, tyfons, signal device, facsimile weather receiver & radio navigator	SNTL
Mechanical log	Walker
ARPA	Selesmar
Autopilot	Racal-Decca
SatNav	Magnavox
Windmeter	Vaisala
Computer-based data logging & calculation system	Wärtsilä
SatCom	JRC
Simplex-receiver antenna	Wärtsilä
Duplex-receiver antenna	ITT
Emerg. antenna	Wärtsilä
Radiostation equipment	SNTL
Anchor/mooring winches, stern anchor winch & cargo-handling/mooring winches	Rauma-Repola
Anchors	HCG
Anchor chain	Swedschain
Anchor wire	United Ropeworks
Steering gears	Wärtsilä

"The simple CAT PAR test made a firm believer out of me!"

**Darrel Stephens, Operations Manager,
Lewis & Clark Marine, Inc.
(formerly Art's Fleeting) St. Louis, MO.**

"Since 1975, we've been operating a barge shuttle and switching business out of St. Louis. In our business, dependability and reliability are critical. If our workboats aren't running, we don't get paid! If our boats aren't operating right, we face not only a dollar loss, but also a real danger on the river.

Recently, we elected to completely overhaul one of our vessels. We repowered with twin CAT 3408 Engines and replaced the wheels. However, when we put the boat back in the water we found we had trouble with the starboard propulsion system. The engine wouldn't come up to speed, and as hard as we tried, our crew couldn't figure out what the problem was.

Our local Cat dealer offered to run a complete Marine PAR (Performance Analysis Report) test, which he told me would pinpoint performance problems in the propulsion system. According to the PAR test, our starboard wheel pitch was off approximately four inches causing our problem.

Frankly, we were skeptical. Yet, our Cat dealer persisted. So, we pulled the boat out of the water and the Cat dealer measured the propeller pitch with a "Caterpillar Pitchometer". This test confirmed the PAR findings. At this point, our only recourse was to have our wheel company pull the wheel and recheck their work.

Sure enough. The wheel was off about four inches . . . just like the PAR test had indicated. They made the changes to the wheel. We put the boat back in the water and the engine RPM's immediately came up to speed.

Had the PAR test not forced our hand, we probably would have struggled along hit-or-miss until we damaged the engine. Instead, our Cat dealer helped us diagnose our situation and prevent major problems and expensive repairs. Now, I'm a firm believer in the PAR test. I feel it's a valuable tool that can be used throughout the industry to identify and prevent potential and existing problems that cost you money and give you headaches. I think a Cat PAR test is money well spent."

For more information contact your nearest Cat dealer, or write to: Caterpillar Engine Division, P.O. Box 7615, Mount Prospect, IL 60056.

Circle 150 on Reader Service Card

CATERPILLAR

transport on deck jackup and semi-submersible oil drilling platforms weighing up to 20,000 tons. The vessel can also be used for docking ships.

The Transself can be submerged by means of water-filled ballast tanks to a depth of about 69 feet, after which the platform is towed above the submerged deck. The ballast tanks are then emptied pneumatically and the loaded vessel rises to transport level.

Onboard there is a flexible computerized interactive management assisting system developed in cooperation with Wartsila and a Dutch company. This computer system can be used for designing and preparing future transports and by using real-time measurements for monitoring and analyzing stability, stresses and movements of the ship during loading, transportation and unloading, also paying attention to the varying environmental conditions.

WASP (LHD-1)
Ingalls

The 40,500-ton amphibious assault ship Wasp (LHD-1), the lead ship of her new class, was christened for the U.S. Navy at Litton's Ingalls Shipbuilding Division in Pascagoula, Miss., in mid-September of this year.

The Wasp will have the primary mission of embarkation, deployment, landing and support of a Marine landing force. The Wasp is 844 feet long, with a beam of 106 feet. Two Westinghouse steam propulsion plants, developing a combined 70,000 horsepower, will drive the ship at speeds of more than 20 knots.

In carrying out this mission, LHD 1 will mount an assault of helicopters, landing craft and other amphibious vehicles in various combination. The Wasp Class is specifically designed to accommodate the air cushion landing craft (LCAC) and Harrier II (AV-8B) STO/VL (Short Take Off/Vertical Landing) jets, which will provide close-in air support of the assault force. The ship will also accommodate the full range of Navy and Marine Corps helicopters, conventional landing craft and amphibious vehicles.

LHD 1 will have more than 22,000 feet of vehicle space, and 100,000 cubic feet of cargo space. Accommodations for nearly 3,000 troops and crew members (the crew numbers 98 officers and 983 enlisted personnel) are provided in the ship's living areas. For combat support, as well as humanitarian missions, LHD 1 will have six fully equipped operating rooms and a 600-bed hospital.

The new ship will join the Navy fleet in early 1989.

WASP (LHD-1)
Equipment List

Steam propulsion turbines and reduction gears	Westinghouse
Ship control consoles	Litton
Boilers	Combustion Engineering
Generators	GE
Steering gears	Jered Brown Brothers
Propulsion shafting	National Forge
Generators	Stewart & Stevenson
Steering controls	Sperry Marine
Propellers	Lips
Bearings	Waukesha
Bearings	American Metal
Rudder bearings	FAG Bearings
Motors	Reliance Electric
Electronic equipment	Litton
Gauges	ITT Barton
Connectors	Viking Connectors
Convertors	Teledyne
Hydraulics	Paul Munroe
Line voltage regulators	Superior Electric
Transducers	Consolidated Control
Electronic equipment	Tektronix
Transformers	Jefferson Electric
Condensers	Graham
Towed sonar array	Gould
Antennas	Chu Associates
Communication systems	GTE
Condensers	Transamerica Delaval
Automatic bus transfers	Ward Leonard
Instruments and gauges	Weksler Instruments
Telephones	AT&T
Coils	Mario Coil
Circuit breakers	Gould
Switchboards	International Switchboard
Controllers	GE
Pushbuttons	GE
Pushbuttons	Eaton/Cutler Hammer
Degaussing system	Louis Allis
Tank level system	IMO Delaval
Electric cable	BIW Cable
Terminals	Waldo Bros.
Pumps	Hardie Tynes
Pumps	Carver Pumps

Pumps	Warren Pumps
Pumps	Dover
Fire pumps	Worthington Pump
Pumps	Buffalo Pumps
Pumps	Transamerica Delaval
Pumps	Peabody Barnes
Pumps	MT Davidson
Valves	Cla Val
Strainers/valves	CM Bailey
Valves	Contromatics
Purifiers	Alfa-Laval
Valves	Marotta Scientific
Valves	WE Williams
Valves	Wm. Powell
Valves	Leslie
Distillers	Aqua Chem
Hoses	Aeroquip
Valves	Liberty
Pipe & pipe fittings	Alaskan Copper & Brass
Valves	Milwaukee Valve
A/C plant	York
Refrig. plants	Carrier Transcold
Air compressors	Dresser-Rand
Heaters	ITT Standard
Fans	Buffalo Fans
Fire systems	Hiller
Fire protection	Wormald
Sirens and signal amplifiers	Henschel
Loudspeakers	Dynalec
Clocks	Chelsea
Forced draft blowers	United Technology Elliott
Elevators	Jared Brown Brothers
Doors	Advanced Structures
Bulkheads	Hexcel
Winches	Hyde
Capstan & winches	Lake Shore
Anchors & chains	Baldt
Steel	US Steel
Steel	Bethlehem Steel
Cathodic protection	Electrocatalytic

YAMATAKA MARU
Hitachi Zosen

The Yamataka Maru, a 38,217-dwt ultra-rationalized, high-speed and large-sized containership was delivered during the fall of last year by Hitachi Zosen's Innoshima Works to its owner, Yamashita-Shinnihon Steamship Co., Ltd., of Japan.

The advanced containership, which carries 2,500 TEU containers (stacked three high on the deck, with 236 refrigerated containers), is capable of carrying automobiles and hazardous cargo such as radioactive substances in containers.

The Yamataka Maru is equipped with an automatic radar plotting aid and various automatic navigational equipment for energy and manpower savings. She also has a bulbous bow to decrease fuel consumption and a stern bulb to reduce hull vibration.

The 42,145-gt vessel has an overall length of 754 feet, depth of 71 feet and breadth of 106 feet. She is powered by a Hitachi Zosen-MAN B&W 9K80MC diesel engine rated at 32,300 hp at 91 rpm. Her trial speed was over 25 knots.

Photo right: Yamataka Maru

YAMATAKA MARU
Equipment List

Main engine	Hitachi Zosen-MAN B&W
Propeller	Kobe Steel
Propeller shaft	Hitachi Zosen
Generator	Shinko
Boiler	Osaka Boiler
Stern tube bearing	Nippon Dover
Steering gear	Hitachi Zosen
Gyrocompass and autopilot	Yokogawa Navitec
Radar	Tokyo Keiki
Echo sounder	Kaijo Denki
Doppler log	Furuno
Direction finder	Koden
Integrated autonavigation system	Hitachi Zosen
Cathodic protection	Electrocatalytic

MIT Announces Spring Program In Port Planning, Development, Engineering

The Advanced Study Program of MIT's Center for Advanced Engineering Study is offering a 16-week graduate level program for practicing port planners and engineers directed by **E. G. Frankel,** professor of Ocean Systems, a well-known port planner and engineer, senior advisor on ports to the International Maritime Organization, and formerly port and shipping advisor at the World Bank. The program allows concentration in the broad areas of port planning, port management, port development, port construction management, port engineering, and port maintenance.

Activities are tailored to the background and needs of each participant. MIT offers over one thousand courses. Electives will be chosen after consultation with Professor **Frankel** and other faculty members. Courses may be taken for credit or as an auditor.

The program provides study offices, a project facility, computer facilities, videotape library and viewing facilities, and social activities for participants. Participants share classrooms, libraries, athletic and other facilities of MIT with regular students. The program also provides opportunities for participants to develop or improve their skills using microcomputers and to review basic subjects such as microeconomics and mathematics.

The fee for the program is $9,300. The fee does not include books or living expenses.

The program starts on February 1, 1988, and end on May 18, 1988. A certificate is awarded for satisfactory completion.

For general information, description of subjects, a brochure on the Advanced Study Program and an application form, call or write: Dr. **Paul Brown,** Director, Advanced Study Programs, Center for Advanced Engineering Study, Room 9-335, Massachusetts Institute of Technology, Cambridge, MA 02139, Telephone: 617-253-6161, Telex: 92-1473, Telecopier: 617-258-8831.

If you have questions about the appropriateness of the program for you or about selecting your candidate call or write: Dr. **Ernst Frankel,** Professor of Ocean Systems, Department of Ocean Engineering, Room 5-222B, Massachusetts Institute of Technology, Cambridge, MA 02139, Telephone: 617-253-6763.

MMS Delivers Planned Maintenance System For Canarctic Icebreaker

Marine Management Systems (MMS) recently implemented their Planned Maintenance (PMS) system aboard an icebreaker owned by Canarctic Shipping, Ltd, of Ottawa, Canada, according to an announcement made by MMS vice president, **Don Logan.**

Operating under a contract awarded through the Marine Management Centre (MMC) in London, England, the PMS system was installed aboard the M/V Arctic, a Grade 4 icebreaker/oil bulk ore carrier/research ship. The Arctic operates in the northern Canadian regions where on-the-spot maintenance procedures are vital and operating costs are high, making planned maintenance a crucial concern.

Canarctic engineers were trained by MMS technical staff in Stamford, Conn., and the system was installed by MMC personnel. Full shipboard IBM PC/AT computer configuration and ongoing support for the project will be handled by MMS.

Founded in 1969, MMS is a leader in providing computerized management information systems for the shipping industry. The PMS System is part of MMS' Ship Management Information Series of systems for shoreside and shipboard use.

For further information and free literature on Marine Management Systems,

Circle 46 on Reader Service Card

NKF Engineering Forms Arctic Technology Group

Formation of the Arctic Technology Group in Columbia, Md., has been announced by **George Amir,** president of NKF Engineering, Inc. of Reston, Va.

The group was formed to provide a broad range of engineering and research services associated with marine activities in the Arctic and cold regions of the world. The three principals are **Jim St. John, Larry Schultz,** and **Dick Voelker,** recognized leaders in the field of Arctic technology.

Services offered by the Arctic Technology Group include analytic and design studies, laboratory studies, and field operations and trials. The group also gives seminars on Arctic/cold weather technology to those concerned with high latitude marine operations.

A new, four-color brochure describing the Arctic Technology Group and the complete NKF organization is available. For a free copy,

Circle 61 on Reader Service Card

Pearcy Marine Appoints William Sanchez As Operations Supervisor

Pearcy Marine, Inc. has appointed **F. William (Billy) Sanchez** as supervisor of operations.

Mr. **Sanchez** has served as vessel captain and port captain in the maritime industry for 30 years. He will be assigned to Pearcy Marine's Houston, Texas, office.

Furuno Electric Company Acquires ISR In Europe

Furuno Electric Company, Ltd. of Nishinomiya City, Japan, recently announced that they have concluded an agreement with Sait Electronics S.A. of Belgium to acquire International Skibs Radio A/S (ISR) of Denmark, a subsidiary of the Sait Group. Under this agreement, Furuno also acquires Svensk Marine Radio A/B in Sweden and Marina in Denmark, both ISR companies.

The take-over was effective October 1, 1987, at which time the new companies started operating as Furuno Sverige A/B (formerly Svensk Marine Radio). This new arrangement strengthens a 30-year relationship between Furuno and Sait, extending their coverage into new markets and enhancing customer support in the Nordic countries.

With these two new companies, Furuno now has a total of six subsidiaries in Europe, including two in the U.K., two in Denmark, one in Norway, and one in Sweden, plus Furuno U.S.A., Inc., in the U.S.

For more information and free literature,

Circle 31 on Reader Service Card

Jotun Institutes Move To Strengthen Marine Market Competitiveness

Jotun Protective Coatings (JPC) of Norway has announced a strategic plan in which the marine paints production plants in Sandefjord, and the Brighton plant, will be transferred to a new plant to be built in Flixborough, some 20 miles from Hull.

The move is being instituted to make the production structure more effective in order for JPC to continue as one of the world's leading paint suppliers to the worldwide marine market. JPC's most prominent group of customers is still the world's shipping fleet.

The new plant at Flixborough is expected to take about a year to build and will result in a reduction in the number of employees, but the company has said that there will be no dismissals.

For free literature giving full information on Jotun Protective Coatings,

Circle 38 on Reader Service Card

Interest In Multi-Passenger Tourist Submersibles Continues At Strong Pace

Interest in multi-passenger submersibles, primarily for the tourist trade, continues at the strong pace of 1986, when several were classed.

So far in 1987, ABS has received eight requests for classification for tourist-type submarines from builders in five countries. Most of the vessels will be made of steel, but two of the ones currently proposed will be constructed of acrylic plastic.

Operating depth of the eight submersibles range from 150 to 2,500 feet, with passenger capacities ranging from 28 to 50. With these requests for classification come inquiries worldwide from designers of tourist submersibles.

MarAd Announces Availability Of Report

The Maritime Administration has announced the availability of the following report:

"Navigation/Communications Program for Inland Waterways, Volume II: Requirements Definitions Statement," prepared by Transportation Systems Center, Cambridge, Mass.

This, the second volume in a series of studies, attempts to define the accuracy and control requirements for navigation and associated communications in restricted inland waterways. The overall program objective is to determine how inland waterway navigation can be more productive and still be safe in times of darkness or adverse weather conditions. The use of developing electronic systems to supplement the existing visual navigation aids are evaluated.

The report may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. The order number is PB88-107024/AS; the price $24.95.

Crowley Maritime Selling Columbia Marine Lines To Tidewater Barge

Crowley Maritime Corporation, San Francisco, Calif., has entered into a contract to sell its Columbia Marine Lines to Tidewater Barge Lines (Tidewater), Vancouver, Wash. Tidewater is the largest towboat entity operating on the Columbia River, with a fleet consisting of over 70 barges and 14 tugs.

Bennex Reports Early Success For New Lightweight Oil Booms

The new NOAS-series range of lightweight oil pollution control booms from Bennex A/S of Bergen, Norway, has met early success in the market with 5,000 meters already ordered for 1987 delivery.

Orders valued in excess of 10 million NOK (about $16,500,000) for the new booms, which are rated for harbor, coastal and offshore use, have included deliveries to Statoil for use at the Mongstad terminal, to Norsk Hydro for deployment from the stand-by vessel Far Scout on the Oseberg field and to Italy as part of the country's contingency plan for high seas oil pollution control.

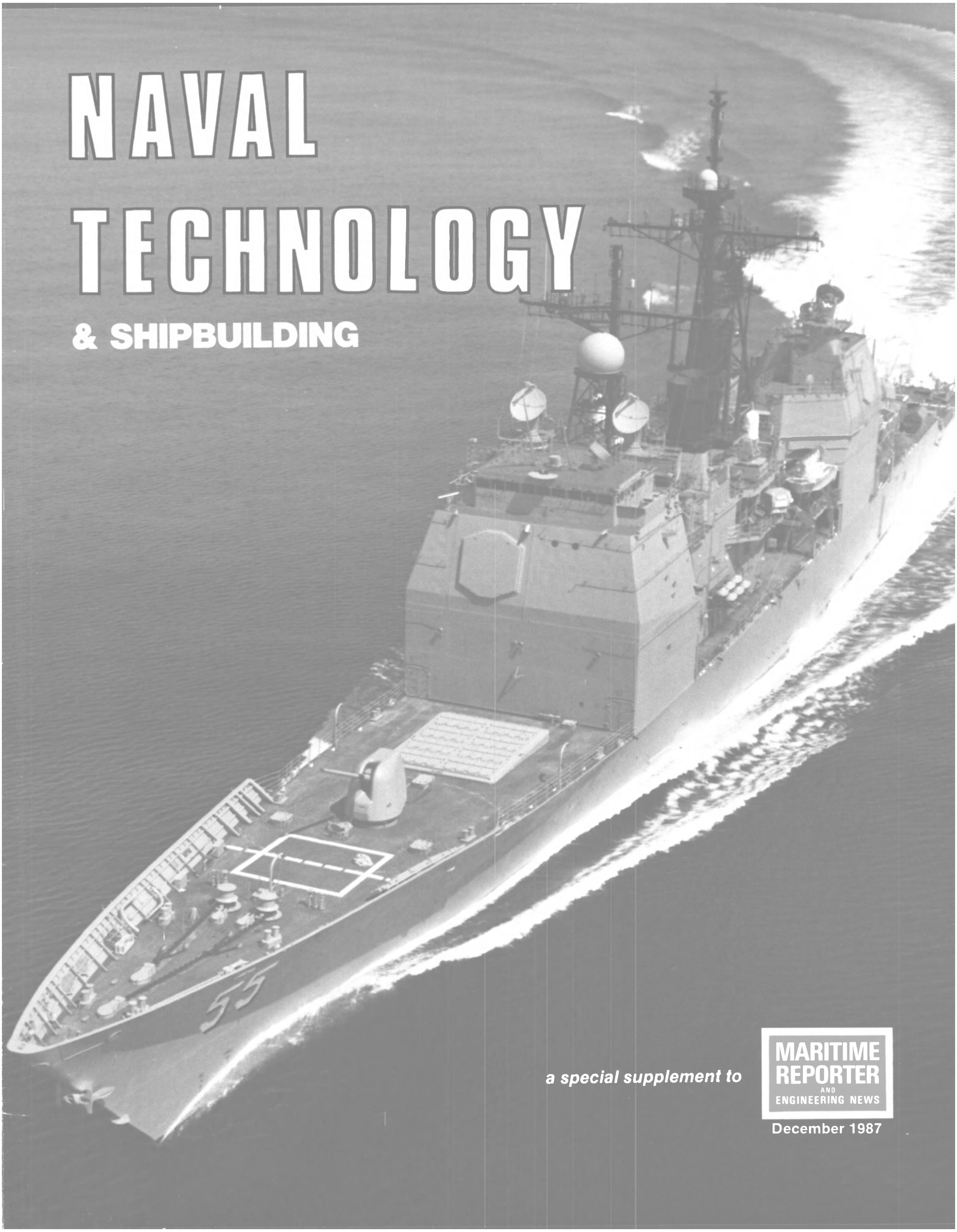
Bennex says the NOAS-series oil booms are easier to handle than conventional designs because of their lightweight, flexible design and unique configuration which features new floatation chambers in airtight PVC-coated polyester.

The NOAS 1000-series oil boom range comprises five different model designs from the 300X for harbor use in wave heights of up to 1 meter to the 1000 N for offshore applications in 6 meter seas and heavy winds up to force 8.

For full details on these deliveries and the Bennex NOAS 1000-series oil pollution control booms,

Circle 35 on Reader Service Card

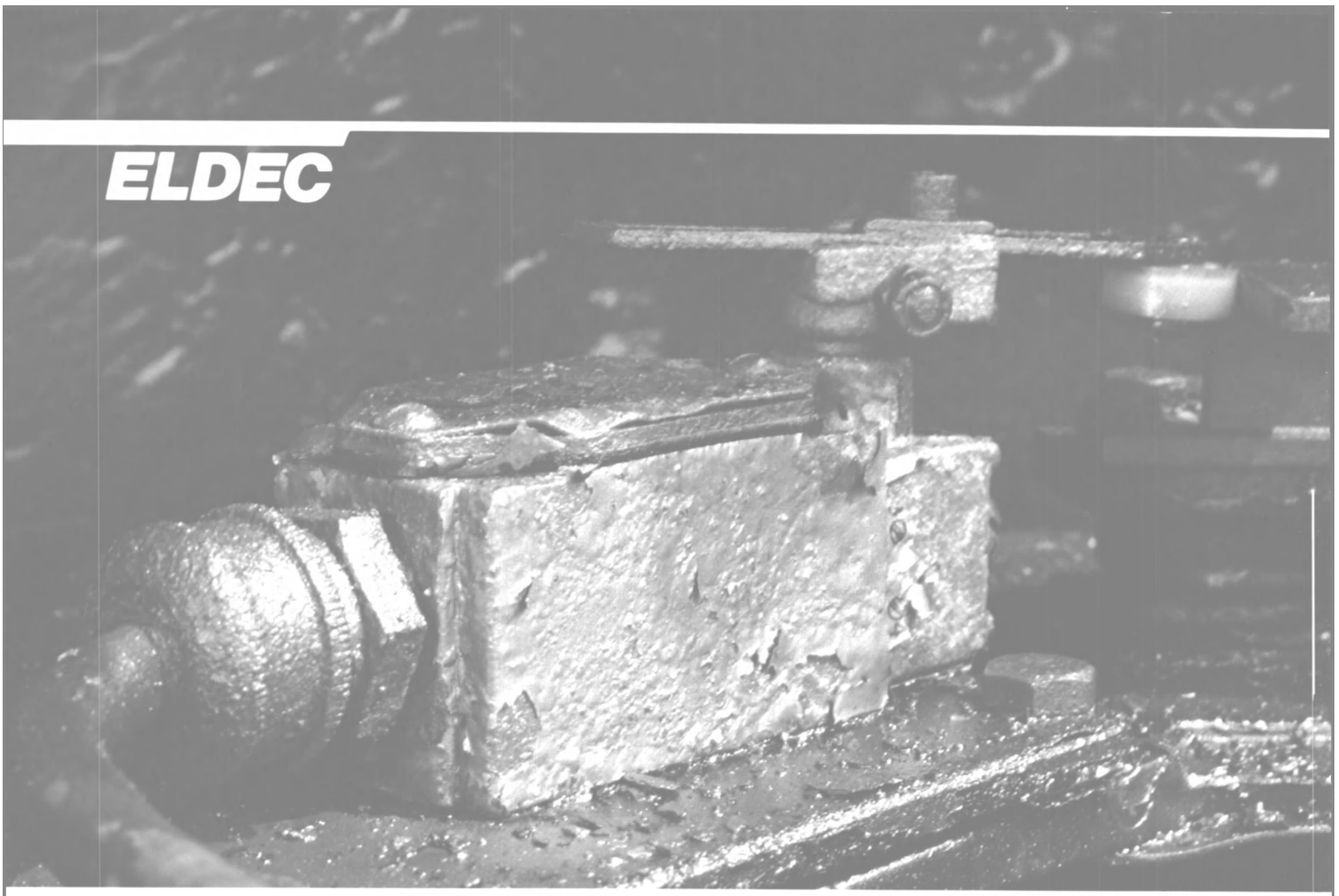
NAVAL TECHNOLOGY & SHIPBUILDING



a special supplement to

MARITIME REPORTER AND ENGINEERING NEWS

December 1987



TIME FOR A SWITCH...

After 20,000 cycles, when most mechanical switches are through, ELDEC solid-state switches are just beginning.

In fact, lifespans of over one million cycles are typical. But that kind of reliability is no good if the electronics can't survive the marine environment.

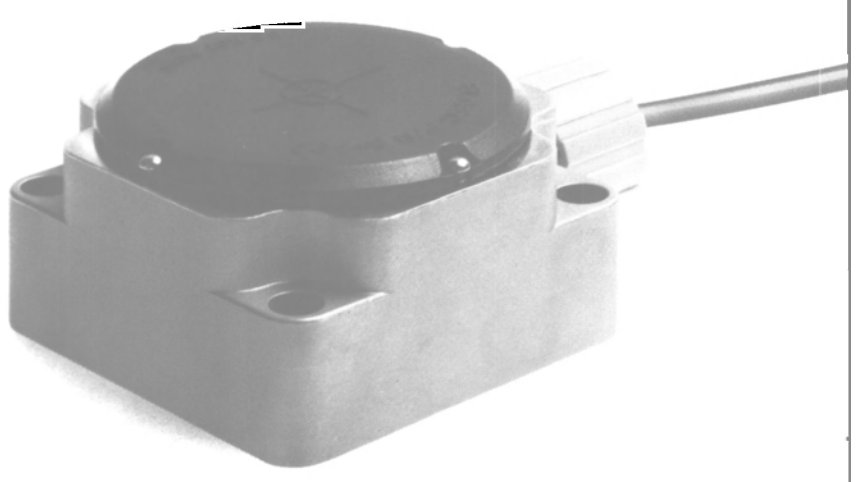
ELDEC non-contacting switches can stand up to the sea.

- Encased in non-corroding, stainless steel.
- EMI hardened to **exceed** MIL STD 461B, Class A4.
- Operating range from −30° to +65°C.
- Meets MIL STD 901C, Grade A, Class 1 for shock.

Two wire AC and three wire DC switches for direct mechanical replacement.

The price is right.
Purchase price is competitive with the best quality mechanical switches. And with less maintenance and replacements, life cycle cost savings are unsurpassed.

Send for more information today.
Once you compare, you'll agree, it's time for a switch.



ELDEC®

COMMITTED TO PERFORMANCE™

Eldec Corporation, Lynnwood, Washington USA
Tel. 206-487-4000 • TWX: 910-449-0873

Circle 152 on Reader Service Card

U.S. NAVY BUSINESS OPPORTUNITIES —AN UPDATE—

By Dr. James R. McCaul, President,
International Maritime Associates, Inc.

NAVY PROGRAM OFFERS BILLIONS IN SALES OPPORTUNITIES TO SUPPLIERS

The U.S. Navy has clearly become the dominant customer for marine suppliers and shipyards in this country. While the pace of new projects has slowed, Navy continues to provide a flow of new business opportunities for shipbuilders and ship system manufacturers.

This article gives an update of the Navy business developments and future opportunities. It is based on information provided on a continuing basis to subscribers to IMA's quarterly business reports on Navy procurement and maintenance business. Details are available from IMA.

Photo—USS Whidbey Island (LSD-41) lead ship for a class of dock landing ships.

1. STATUS OF NAVY SHIPBUILDING

Programs of most interest to shipbuilders are new starts planned in the near future. They include the SSN 21, LSD 41 cargo variant, a new class of oceanographic ship, jumboization of the AO 177 fleet oiler and procurement of a new class of high speed patrol boat.

Equipment suppliers should also be interested in programs which have moved to early production. They include the DDG 51 Aegis destroyer being built by Bath and Ingalls, the TAO 187 fleet oiler now being built by Avondale and PennShip, and the AOE 6 fast combat ship under construction at NASSCO.

Even selected mature programs offer business opportunities to equipment manufacturers. They include the CVN aircraft carriers on order and planned, the CG 47 Aegis cruiser program finishing up at Ingalls and Bath, and the Trident submarine program at General Dynamics-Electric Boat.

The status of key shipbuilding

(continued)

U. S. NAVY

Exhibit 1
Status of Key Shipbuilding Programs

	Program	Main Players	Status	Future Plan	Comments
New Starts	SSN 21	GD, Newport News	final design	30 subs	expensive, controversial
	LSD 41 CV	Avondale, ??	RFP due out	6 ships	could be delayed by Congress
	AGOR/TAGS	open	RFP on street for AGOR 23	3-6 ships	future ships will be twin hull design
	AO 177 jumbo	open	RFP on street for 1st ship + options	4 more	low priority, program may end after 1st ship
	PXM	European builders	early design review	6 boats	COR/RFP due out next year
Early Production	DDG 51	Bath, Ingalls	3 ships on order	26 more	3rd ship just awarded to Bath, production problems
	TAO 187	Avondale, PennShip	3 completed 8 on order	7 more	open competition for remaining ships
	TAGOS (SWATH)	McDermott	1 on order with 3 options	4 more	2nd source planned
	MCM	Peterson, Marinette	1st ship delivered 7 on order	6 more	production problems, remaining ships may be openly competed
	MHC	Intermarine	1st ship on order	16 more	2nd source planned
	LCAC	Bell, Lockheed	10 delivered 23 on order	60 more	production problems
	AOE	NASSCO	1 on order	3 options	equipment selection in progress
Mature Programs	CVN	Newport News	2 on order	2 more planned	expensive, controvertial—could be cut
	CG 47	Ingalls, Bath	9 delivered 13 on order	5 more	remaining ships in FY 88 budget
	Trident	GD	8 delivered 6 on order	6 more	Newport News may be 2nd source

Exhibit 2
Legislative Status of Navy FY 1988 Shipbuilding Program Request
($ in millions)

	Budget Request		Authorization: House Authorization Bill		Authorization: Senate Authorization Bill		Appropriation: House Appropriations Bill		Appropriation: Senate Appropriations Bill
Program	No. Ships	$	No. Ships	$	No. Ships	$	No. Ships	$	
Construction									
Trident Submarine (SSBN)	1	$1,331	1	$1,331	1	$1,291	1	$1,261	
Aircraft Carrier (CVN)	—	644	—	644	—	644	—	617	
Attack Submarine (SSN-688)	3	1,737	3	1,737	3	1,737	3	1,677	
New Attack Submarine (SSN-21)	—	258	—	258	—	258	—	258	
Aegis Cruiser (CG-47)	2	1,938	5	4,129	5	4,145	2	1,938	
Aegis Destroyer (DDG-51)	3	2,197	0	6	0	6	0	6	
Amphib. Assault Ship (LHD)	1	773	1	773	1	717	1	704	
Amphib. Landing Craft (LSD 41 CV)	1	324	1	324	0	0	1	258	
Mine Countermeasure Ship (MCM)	3	297	0	0	0	0	0	0	
Fleet Oiler (TAO-187)	2	279	2	279	1	150	2	256	
Ocean Surveillance Ship (TAGOS)	0	0	0	0	2	111	0	0	
Landing Craft (LCAC)	—	44	—	44	—	44	—	34	
Conversion									
Carrier Modernization (CV SLEP)	1	730	1	730	1	730	1	730	
Fleet Oiler Lengthening (AO 177)	1	44	1	44	1	44	1	44	
Crane Ship Conversion (TACS)	2	53	2	53	2	53	0	0	
Other									
Service Craft	—	13	—	13	—	13	—	13	
Strategic Sealift	—	43	—	43	—	43	—	43	
Sealift Enhancement	—	18	—	18	—	0	—	0	
Fast Sealift Initiative	—	0	—	0	—	10	—	0	
Outfitting	—	203	—	203	—	203	—	203	
Post Delivery	—	141	—	141	—	141	—	132	
General Reduction	—	—	—	—	—	(259)			
Total Budget		$11,065		$10,768		$10,081		$3,172	
Number of Ships									
Construction	16		13		13		10		
Conversion	4		4		4		2		

No action to date

Source: FY1988 Defense Authorization and Appropriations Bills

programs is summarized in Exhibit 1.

2. FUTURE FUNDING OF SHIP CONSTRUCTION

The Navy proposed to build 16 ships and perform four major conversions in FY 1988. At time of preparing this article there had been no resolution of the FY 1988 budget. But the actions taken thus far by Congress clearly indicate a reduction is expected.

The House and Senate authorization bills provide for construction of 13 ships. Major change is in the Aegis surface combatant program. The President requested a program of two CG 47 Aegis cruisers and three DDG 51 Aegis destroyers. Both House and Senate deleted the DDG 51's from the program—but instead authorized five CG 47's.

In late October the House approved a defense appropriations bill. It makes cuts in funding for ship construction. The House bill provides funding for two Aegis ships—denying the request for three DDG 51's. It also denies funding for the MCM minesweeper in FY 1988 and cuts the crane ships conversion plan.

The House appropriations bill contains some interesting items. It orders a study to be made by Navy of a build and charter program for strategic sealift tankers. The bill also requires the Navy to conduct "a full and open competition for the fiscal year 1989 DDG 51 ships and the awarding of at least one ship to a third shipyard." Navy can be expected to oppose this requirement and attempt to have it deleted in the final House/Senate appropriations bill language. Another interesting item in the House bill is a request that the Navy consider an alternative design for the LSD 41 cargo variant. It requests that the Navy "examine the viability and cost effectiveness of a modified SL-7 design, with LM 2500 engines as a cargo variant."

Details on the FY 1988 shipbuilding funding request and Congressional action to date are shown in Exhibit 2. Note that the Senate had not yet acted on a defense appropriations bill—and cuts resulting from deficit reduction negotiations are expected to affect the final defense budget.

3. FUNDING OF SHIP SYSTEMS AND EQUIPMENT

The President's budget requested $22 billion to fund weapons, other procurement and provide funds for research and development in FY 1988. Both House and Senate have authorized reduced programs.

In late October the House passed a defense appropriations bill making serious cuts in this portion of the Navy budget. The total was cut from $22 to $19 billion.

The House appropriations bill contains some items of particular interest to marine suppliers. It includes an additional $10 million to be used "solely for the purchase of U.S.-built, totally enclosed survival systems." These will be state-of-the-art survival systems for use on civilian manned T-ships operated by MSC. Another item is an additional $12 million for the continued dual source procurement of seasheds and adapters.

A new buy American provision is also contained in the House appro-

(continued)

Exhibit 4
Legislative Status Of Funding For Navy Ship Maintenance And Modernization In FY 1988
($ in millions)

	Budget Request	Appropriation	
		House Appropriations Bill	Senate Appropriations Bills
Active Fleet Ship Depot Maintenance	$2,775	$2,613	No Action To Date
Active Fleet Ship Modernization	$1,291	$1,291	
NRF Ship Maintenance And Modernization	$178	$174	

Source: Navy Budget Request
House Defense Appropriation Bill

Exhibit 3
Legislative Status of FY1988 Funding for Navy Weapons, Equipment and Systems
(in millions of $)

	Authorization			Appropriation	
	Budget Request	House Authorization Bill	Senate Authorization Bill	House Appropriations Bill	Senate Appropriations Bill
Weapons	$6,502	$6,482	$6,220	$5,366	No
Other Procurement	4,984	5,254	4,968	5,012	Action
Research & Development	10,490	9,292	10,269	8,635	To Date

Source FY1988 Defense Authorization and Appropriations Bill

U.S. NAVY

(continued)

priations bill. It prohibits using funds to procure welded anchor chains and mooring chains four or less inches in diameter outside the United States or Canada.

Exhibit 3 summarizes the status of FY 1988 funding for Navy weapons, equipment and systems as of early November.

4. SHIP MAINTENANCE

The Navy plans to perform 34 overhauls, 113 SRA's and 68 PMA's in FY 1988. This work will be performed in both private and naval shipyards. It represents the major source of business to shipyards in this country.

IMA's analysis of the Navy maintenance work profile indicates 16 active fleet and three NRF ship overhauls will be contracted to commercial yards in FY 1988. The remainder of overhaul work will either be performed in naval shipyards or made part of the public/private competition.

The House appropriations bill contains language which affects overhaul and maintenance policy. Navy is directed to limit interport differentials on the West Coast to "only those historical foreseeable costs which can accurately be estimated—fuel to transport such vessels to the port of repair and to pay for the onboard crew en route. The bill also continues to prohibit overseas ship maintenance for ships normally homeported in the United States, except for voyage repairs.

Requested funding for ship maintenance and modernization along with appropriation action to date is shown in Exhibit 4. The ongoing negotiation to reduce the budget deficit in FY 1988 and future years will likely have significant impact on actual maintenance funding. ■

MAJOR NAVY CONTRACTS

The following special section covers the major U.S. Navy contract awards received between the dates of July 31 through September 18 of this year. For coverage of Navy contract awards prior to these dates refer to Maritime Reporter, September 1987 issue, Naval Technology and Shipbuilding Supplement.

July 31

ANADAC Incorporated, Arlington, Va., is being awarded a **$6,200,907** cost-plus-fixed-fee contract for support services for the Trident submarine acquisition program. Work will be performed in Arlington and is expected to be completed July 31, 1992. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6363).

General Dynamics Corporation, Pomona Division, Pomona, Calif., is being awarded a **$154,093,498** fixed-price-incentive contract for 59 Phalanx Close-In Weapon Sys-Tems. Work will be performed in Pomona and is expected to be completed in September 1989. This contract combines purchases for the U.S. Navy (73 percent), Taiwan (7 percent), Japan (17 percent) and Portugal (3 percent) under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5456).

RCA Corporation, Moorestown, N.J., is being awarded a **$63,142,771** cost-plus-fixed-fee contract for engineering technical services for the Aegis shipbuilding program. Work will be performed in Moorestown and is expected to be completed June 30, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5188).

August 3

General Dynamics Corporation, Pomona Division, Pomona, Calif., is being awarded a **$20,824,268** cost-plus-fixed-fee contract for production support services for the MK 15 Phalanx Close-In Weapon System. Work will be performed in Pomona and is expected to be completed June 30, 1988. This contract combines purchases for the U.S. Navy (77 percent) and for the United Kingdom (11 percent), Greece (.4 percent), Pakistan (1 percent), Portugal (.5 percent), Taiwan (1.6 percent), Israel (.3 percent), Saudi Arabia (.2 percent), Japan (6.5 percent) and Australia (1.5 percent) under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5433).

Sippican Incorporated, Marion, Mass., is being awarded a **$4,999,925** fixed-price-incentive modification to a previously awarded cost-plus-award-fee contract for materials and services for Expendable Mobile ASW Training Targets. Work will be performed in Marion and is expected to be completed in December 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-82-C-6224).

August 4

McDermott Shipyard, Amelia, La., is being awarded a **$21,669,165** firm-fixed-price contract for two Torpedo Test Craft (YTT). Work will be performed in Amelia and is expected to be completed in July 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-2026).

John J. McMullen Associates Incorporated, New York, N.Y., is being awarded a **$7,000,000** cost-plus-fixed-fee contract for production/technical engineering services for CG-47 and DDG-51 class ships. Work will be performed in Bath, Maine (22 percent); Pascagoula, Miss. (26 percent); and Crystal City, Va. (52 percent), and is expected to be completed May 2, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-2328).

General Ship Corporation, East Boston, Mass., is being awarded a **$8,801,078** firm-fixed-price contract for the Regular Overhaul (ROH) of USS Trippe (FF-1075). Work will be performed in Boston and is expected to be completed May 2, 1988. The Naval Sea System Command, Washington, D.C., is the contracting activity (N00024-85-H-8157).

Pennsylvania Shipbuilding, Chester, Pa., is being awarded a **$3,420,709** firm-fixed-price contract for Selective Restrictive Availability for USS Clark (FFG-11). Work will be performed in Philadelphia, Pa. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8200).

(continued)

Navy Commissions USS Avenger, Its New Mine Countermeasure Ship, At Peterson Builders

—Literature Offered—

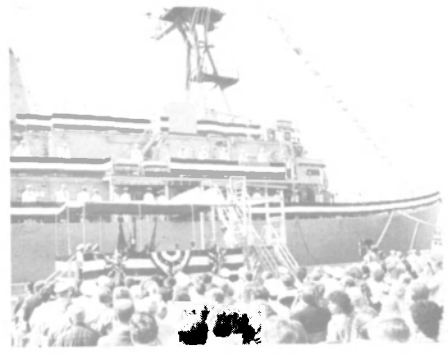
The first of the U.S. Navy's newest class of mine counter-measure ship, USS Avenger (MCM-1) was recently commissioned at the yard of her builder, Peterson Builders, Inc. (PBI), in Sturgeon Bay, Wis.

Mrs. **Sybil Bailey Stockdale,** the ship's sponsor, who christened the Avenger June 15, 1985, attended the ceremonies as an honored guest. Her husband, retired U.S. Navy Vice Adm. **James B. Stockdale,** was the principal speaker at the commissioning.

Other dignitaries at the commissioning ceremony were: Vice Adm. **William F. McCauley,** USN, Commander, Naval Surface Force, U.S. Atlantic Fleet; Vice Adm. **William H. Rowden,** USN, Commander, Naval Sea Systems Command; Under Secretary of the Navy, **H. Lawrence Garret III**; Wisconsin Congressman **Les Aspin,** Chairman of the House Armed Services Committee; Wisconsin Senator **Robert Kasten**; Sturgeon Bay Supervisor of Shipbuilding, Capt. **Thomas J. Kile,** USN, and PBI president, **Ellsworth L. Peterson**.

The Avenger Class MCMs are the Navy's largest wooden ships, measuring 224 feet long, with a 39-foot beam. The Avenger is powered by four 600-hp Waukesha diesel engines with three diesel generators. The Avenger displaces 1,300 tons and carries a crew of 81 officers and enlisted men.

The introduction of the new Avenger Class into the Navy's active fleet will enhance its surface mine-hunting, minesweeping and mine neutralization capabilities due to the installation of sophisticated mine warfare equipment.



The Avenger, the Navy's newest mine countermeasure ship, was recently commissioned at Peterson Builders, Inc., Sturgeon Bay, Wisc.

For free literature on the shipbuilding and ship-repairing capabilities and facilities,

Circle 23 on Reader Service Card

AVENGER
Equipment List

Main engines	Waukesha
Electric motors	Hansome Electric
Reduction gears	IMO Delaval
CP propellers	Bird-Johnson
Shafting	Bird-Johnson
Bowthruster	Omnithruster
Ship service generators	Tech Systems
Generator engines	Waukesha
Machinery control system	GE
Ship control system	Henschel
Switchboards	Nelson
Anchor windlass and capstan	New England Trawler
Steering system	Jered Brown Bros.
Anchor chain	Baldt
Minesweep generator	Siemens-Allis
Minesweep machinery	A.C. Hoyle
Sonar system	GE
Navigation system	Magnavox
Mine neutralization	Honeywell

Paceco, Inc. Receives Option Award From Navy

Paceco, Inc. a subsidiary of Fruehauf Corporation, has received a $9.7-million option award from the Naval Facilities Engineering Command in Davisville, R.I. With this contract, the Navy is exercising all of its options under a prime contract recently awarded to Paceco in the amount of $20.3 million.

Items to be delivered for the option award include three side-loadable warping tugs; eight causeway sections, powered (CSP); and eight causeway sections, now-powered (CSNP), intermediate.

The manufacturing required will be completed at Paceco's 100-acre complex located on the Harrison County Industrial Seaway in Gulfport, Miss. The completed products will then be shipped by barge from the plant.

In addition to being one of the world's leading designers and manufacturers of container handling equipment, Paceco is one of the South's leading manufacturers of custom-designed heavy machinery and has recently become recognized as a competitive supplier of defense and space-related hardware.

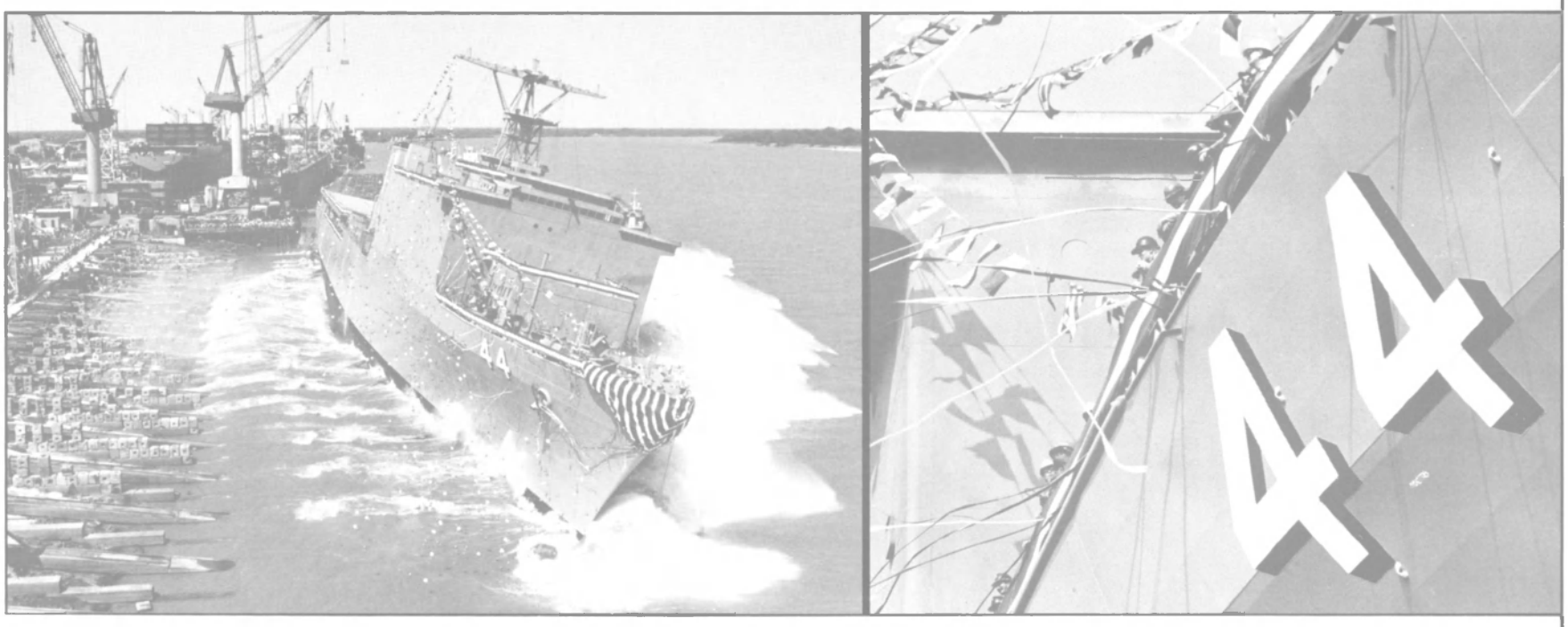
For further information and free literature on Paceco,

Circle 39 on Reader Service Card

Derecktor Yard Wins $2.5-Million Contract For Frigate Work

Robert E. Derecktor Inc.'s Middletown, R.I., shipyard recently was awarded a $2.5-million U.S. Navy contract for the repair and the overhaul of the frigate USS Connole.

"At Avondale we always make the right kind of splash!"



All of us who work for Avondale Industries, Inc. take pride in the quality of our workmanship.

When we send a ship down the ways, we know that ship will make the right kind of splash, not only on launching day but throughout her seagoing career.

These days, we're putting our expertise in modular ship construction to good use in other industries.

Avondale is diversifying, entering such fields as modular construction of utility plants and prefabrication of steel bridges.

Our new customers are discovering what our maritime clients already know...

Avondale not only is outstanding on the ways but in every way.

Avondale...the nation's leader in marine *and* industrial fabrication!

Avondale

Avondale Industries, Inc.
P.O. Box 50280
New Orleans, La. 70150
(504) 436-2121

Avondale Industries, Inc.
An Employee Owned And
Operated Company

Circle 160 on Reader Service Card

U.S. NAVY

CURRENT NAVY & COAST GUARD VESSELS UNDER CONTRACT AT U.S. YARDS

SHIPYARD Navy Designation	NAME	APPROX. CONTRACT $	EST. DELIVERY
Avondale Shipyards			
T-AO-193	Walter S. Diehl	116,000,000	8/88
T-AO-195	Leroy Grumman	101,000,000	1/89
T-AO-197	unnamed	100,633,789	2/90
LSD-44	Gunston Hall	166,000,000	8/88
LSD-45	Comstock	153,400,000	11/88
LSD-46	Tortuga	153,400,000	4/89
LSD-47	unnamed	150,000,000	11/89
LSD-48	unnamed	150,000,000	5/90
Bath Iron Works			
CG-58	Philippine Sea	252,800,000	1/89
CG-60	Normandy	191,800,000	9/89
CG-61	Monterrey	191,800,000	12/89
CG-63	Cowpens	193,300,000	4/90
CG-64	Gettysburg	193,300,000	11/90
CG-67	unnamed	236,041,276	4/92
DDG-51	Arleigh Burke	321,000,000	7/90
DDG-53	John Paul Jones	189,900,000	6/94
DDG-51 Class	—	22,600,000[1]	5/92
Bender Shipbuilding			
LCM-8 Class (4)	unnamed	3,000,000[2]	—
Bethlehem-Sparrows Point			
T-AGS-39	Maury	66,000,000	4/88
T-AGS-40	Tanner	66,000,000	8/88
Bollinger Shipyard			
WPB (16)	unnamed	99,306,516	2/90
General Dynamics-Electric Boat			
SSN-751	San Juan	280,100,000	6/88
SSN-752	Pasadena	280,100,000	10/88
SSN-754	Topeka	324,500,000	2/89
SSN-755	Miami	324,500,000	6/89
SSN-757	Alexandria	283,000,000	10/89
SSN-760	unnamed	258,166,750	2/90
SSN-761	unnamed	258,166,750	6/90
SSN-762	unnamed	258,166,750	10/90
SSN-763	unnamed	258,166,750	2/91
SSN-21 Class	—	28,900,000[3]	—
SSBN-734	Tennessee	523,700,000	12/88
SSBN-735	Pennsylvania	531,600,000	8/89
SSBN-736	unnamed	500,870,000	4/90
SSBN-737	unnamed	616,400,000	12/90
SSBN-738	unnamed	674,100,000	12/91
SSBN-739	unnamed	615,000,000	12/92
SSBN-734 Class	—	48,400,000[3]	12/88
Halter Marine			
T-AGOS-13	Adventurous	14,250,000	3/88
T-AGOS-14	Worthy	14,250,000	7/88
T-AGOS-15	Titan	13,844,067	3/89
T-AGOS-16	Capable	14,031,914	7/89
T-AGOS-17	unnamed	14,031,914	11/89
T-AGOS-18	unnamed	14,031,914	3/90
Ingalls Shipbuilding			
CG-56	San Jacinto		11/87
CG-57	Lake Champlain		4/88
CG-59	Princeton	325,500,000	10/88
CG-62	Chancellorsville	238,600,000	6/89
CG-65	Chosin	242,600,000	11/90
CG-66	Hue City	193,980,662	10/91
CG-68	Anzio	163,980,664	4/92
DDG-52	John Barry	162,149,000	9/91
LHD-1	Wasp	1,365,700,000	3/89
LHD-2	Essex	402,494,000	4/92
LHD-3	unnamed	27,980,000[4]	—
CG-47 Class	—	44,128,775[5]	—

SHIPYARD Navy Designation	NAME	APPROX. CONTRACT $	EST. DELIVERY
Intermarine USA			
MHC-51	unnamed	20,926,936	4/91
Lockheed-Gulfport			
LCAC (2)	unnamed	24,800,000	88
Lockheed-Seattle			
LCAC (7)	unnamed	115,586,251	6/91
LCU (Army-7)	unnamed	26,000,000	—
Lockheed-Savannah			
LCU (Army-13)	unnamed	—	11/87-11/89
Marinette Marine			
MCM-2	Defender	46,000,000	8/88
MCM-4	Champion	42,000,000	12/88
MCM-7	Patriot	51,848,816	10/89
McDermott Inc.			
SWATH T-AGOS-19	unnamed	25,424,347	10/89
Moss Point Marine			
LSV (Army)	General Frank Besson	10,199,339	11/87
LSV (Army-3)	unnamed	30,598,019	3/88
NASSCO			
AOE-6	Supply	290,097,944	4/91
Newport News Shipbuilding			
CVN-72	Abraham Lincoln	1,550,000,000	12/89
CVN-73	George Washington	1,550,000,000	12/91
SSN-723	Oklahoma City	225,100,000	5/88
SSN-750	Newport News	278,000,000	8/88
SSN-753	Albany	319,000,000	7/89
SSN-756	Scranton	259,833,000	9/89
SSN-758	Asheville	259,833,333	1/90
SSN-759	unnamed	259,833,333	6/90
SSN-760	unnamed	55,000,000[6]	—
SSN-764	unnamed	257,118,500	2/91
SSN-765	unnamed	257,118,500	5/91
SSN-766	unnamed	257,118,500	8/91
SSN-767	unnamed	257,118,500	11/91
SSN-21 Class	—	325,000,000[7]	2/94
SSN-21 Class	—	23,390,510[8]	4/88
SSN-21 Class	—	28,900,000[3]	—
Norfolk Shipbuilding			
LSV (Army-4)	unnamed	80,000,000	89
Pennsylvania Shipbuilding			
T-AO-191	Benjamin Isherwood	111,000,000	10/88
T-AO-192	Henry Eckford	111,000,000	5/89
T-AO-194	John Ericsson	97,500,000	2/90
T-AO-196	unnamed	95,025,000	11/90
Peterson Builders			
MCM-3	Sentry	57,900,000	7/88
MCM-5	Guardian	57,900,000	6/89
MCM-6	Devastator	48,287,461	8/89
MCM-8	Scout	48,287,461	6/90
Robert E. Derecktor Shipyard			
WMEC-908	Tahoma	37,700,000	10/87
WMEC-909	Campbell	30,160,000	1/88
WMEC-910	Thetis	30,160,000	5/88
WMEC-911	Forward	30,160,000	9/88
WMEC-912	Legare	30,160,000	1/89
WMEC-913	Mohawk	30,160,000	5/89

Footnotes: 1. Lead yard services contract; 2. Under subcontract from Twin City Shipyard 3. Design contract; 4. Modification to a contract; 5. Yard planning services; 6. Long lead procurement; 7. Detail design contract; 8. Contract services.

KEY TO NAVY DESIGNATIONS

AOE . . . . . Fast Combat Support Ship
CG . . . . . Guided Missile Cruiser
CVN . . . . . Aircraft Carrier, Nuclear
DDG . . . . . Guided Missile Destroyer
FFG . . . . . Guided Missile Frigate
LCAC . . . . . Landing Craft, Air Cusion
LCM . . . . . Landing Craft, Mechanized
LCU . . . . . Landing Craft, Utility
LHD . . . . . Amphibious Transport Dock
LSD . . . . . Dock Landing Ship
LSV . . . . . Logistic Support Vehicles
MCM . . . . Mine Countermeasures Ship
MHC . . . . . Mine Hunter, Coastal
MSH . . . . . Mine Hunter
SSBN . . . . Ballistic Missile Sub, Nuclear
SSN . . . . . Submarine, Nuclear
SWCM . . Special Warfare Craft, Medium
T-AGOS . . . . Ocean Surveillance Ship*
T-AGS . . . . . Surveying Ship*
T-AO . . . . . Oiler*
WMEC . . . . Medium Endurance Cutter†
WPB . . . . . Patrol Boat†

* Assigned to Military Sealift Command
† Coast Guard

CURRENT NAVY & COAST GUARD VESSELS UNDER CONTRACT AT U.S. YARDS

SHIPYARD Navy Designation	NAME	APPROX. CONTRACT $	EST. DELIVERY
Textron Marine			
LCAC 10-12 (3)	unnamed	51,000,000	NA
LCAC-13-24 (12)	unnamed	187,000,000	NA
LCAC (2)	unnamed	38,625,343	11/88
LCAC (10)	unnamed	186,936,237	89-6/91
MSH-1	Cardinal	28,300,000	88
Todd Pacific-San Pedro			
FFG-61	Ingraham	96,100,000	11/88

Recently Awarded Small Military Craft Contracts

SHIPYARD Type of Craft	APPROX. CONTRACT $	EST. DELIVERY
Fiberglass Fabricators		
56-Foot Target Boats (9)	3,674,957	6/88
Marinette Marine		
YP (Yard Patrol Craft) (20)	59,700,000	—
McDermott Inc.		
YTT (Torpedo Test Craft) (2)	21,669,165	7/90
Newport News Shipbuilding		
SEAL Delivery Vehicle Dry-Deck Shelters	3,506,066	5/88
Nichols Bros. Boatbuilders		
Troop Transport Catamaran (Army)	—	—
Oregon Iron Works		
50-Foot Workboats (19)	4,369,226	3/89
Peterson Builders		
Harbor Security Boats (50)	2,650,000	12/88
Rubber Crafters		
MK-6 Lifeboat Assemblies (1,662)	9,960,366	8/88
Ryan Marine		
Towed Array Barge	—	—
Swiftships		
Missile Retrievers (3)	8,105,775[1]	6/88
Tempest Marine		
Fast Coastal Interceptor (USCG)	—	—

[1] Modification

New U.S. Navy Catalog Available From Marine Instrument Company

Marine Instrument Company of Tucson, Arizona, recently announced the availability of their new U.S. Navy catalog.

The publication contains a full listing of all types of compasses, binnacles and nautical instruments manufactured by Marine Instrument Company, identified by nomenclature and National Stock Number (NSN).

Manufacturing under contract to the Navy and Defense General Supply Center, Marine Instrument Company is producing Aneroid Barometers Type I and Type II, Magnetic Compass 7½-inch Reflector, Ships Clinometers, three-arm protractors, and other support items.

The company was started in 1939 in New York City as a naval defense contractor. Today, it is a modern manufacturing facility working under MIL-I-45208, a Quality Assurance/Product Reliability U.S. Government specification.

The catalog is available from Marine Instrument Company, 5425 North Linda Place, Tucson, Arizona 85704, phone (602) 887-9629.

Tampa Shipyards Awarded $43.2-Million Contract To Convert Obsolete Vessels

Tampa Shipyards, Inc., Tampa, Fla., has been awarded a $43.2-million Navy contract to convert two commercial obsolete vessels into TACS (crane ships). Both ships are 20,000 dwt, 25-year-old C6-S-IXC container vessels. One was owned by United States Lines, Inc., Cranford, N.J., and the other by American President Lines, Ltd., Oakland, Calif.

Major Navy Contracts

(continued)

August 6

American Automar Incorporated, Washington, D.C., is being awarded a **$37,335,060** firm-fixed-price contract for the time charter of M/V American Cormorant, a U.S. flag, semi-submersible heavy equipment lift vessel. The contract period is for 17 months with two 17 month options. Delivery will be between November 25, 1987 and January 25, 1988. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-87-C-0115).

Southwest Marine, Terminal Island, Calif., is being awarded a **$7,156,797** firm-fixed-price contract for Selected Restricted Availability (SRA) of USS Prairie (AD-15). Work will be performed in Terminal Island and is expected to be completed January 1, 1988. The Supervisor of Shipbuilding, Conversion and Repair, Long Beach, Calif., is the contracting activity (N65870-87-R-0067).

August 7

SMA Incorporated, Landover, Md., is being awarded a **$5,564,145** cost-plus-fixed-fee contract for engineering, technical and management support services for the Royal Australian Navy (RAN) DDG program. Work will be performed in Landover and is expected to be completed July 31, 1990. This contract is in support of a Foreign Military Sale to Australia. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6092).

August 14

Gee Marine Diesel Corporation, Brooklyn, N.Y., is being awarded a **$3,577,588** firm-fixed-price contract for Drydocking Selected Restricted Availability (DSRA) for USS Nitro (AE-23). Work will be performed at New York Shipyard, Brooklyn and is expected to be completed November 6, 1987. The Supervisor of Shipbuilding, Conversion and Repair, Brooklyn, N.Y., is the contracting activity (N00024-85-H-8150).

General Electric Company, Drive Systems Operations, Salem, Va., is being awarded a **$4,500,000** fixed-price-incentive contract for the design of rectified generators for USS Lipscomb (SSN-685). Work will be performed in Salem, Va. (55 percent) and Schenectady, N.Y. (45 percent) and is expected to be completed in January 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-4015).

Charleston Naval Shipyard, Charleston, S.C., is the successful offeror in a competitive program between public and private sector shipyards for the overhaul, alteration, repair, refueling and testing of USS Andrew Jackson (SSBN-619). Charleston Naval Shipyard is being assigned the overhaul on a fixed-price-incentive basis. The target price of this effort is **$112,058,684.** Work will be performed in Charleston and is expected to be completed March 1, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Southwest Marine Incorporated, San Diego, Calif., is being awarded a **$16,114,285** firm-fixed-price contract for the Regular Overhaul (ROH) of USS Okinawa (LPH-3). Work will be performed in San Diego and is expected to be completed July 15, 1988. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8221).

General Electric Company, Drives, Motor and Generator Department, Erie, Pa., is being awarded a **$3,618,000** firm-fixed-price contract for ship service motor generators in support of the SSN-688 class Extended Submarine Engineered Operating Cycle (ESEOC) program. Work will be performed in Erie and is expected to be completed in December 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-4402).

August 18

Raytheon Company, Goleta, Calif., is being awarded a **$7,462,600** cost-plus-incentive-fee contract for materials for AN/SLQ-32 electronic warfare systems. Work will be performed in Goleta and is expected to be completed December 31, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5039).

August 20

Sea-Barge Group Inc., Miami, Fla., is being awarded a **$4,757,832** firm-fixed-rate indefinite delivery, indefinite quantity contract for the carriage of U.S. military sponsored cargo between the United States and Bermuda. Breakbulk and container service will be provided on a U.S.-flag ship. The contract performance period is 24 months, effective October 1, 1987. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-88-C-8505).

Litton Systems Inc., Ingalls Shipbuilding Division, Pascagoula, Miss., is being awarded a **$12,336,102** cost-plus-fixed-fee contract for the planning phase for the restoration of USS Stark (FFG-31). Work will be performed in Pascagoula. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-8522).

August 21

FMC Corporation, Northern Ordnance Division, Minneapolis, Minn., is being awarded a **$10,083,299** firm-fixed-price contract for MK 41 vertical launching systems for CG-47, DD-963 and DDG-51 class ships. Work will be performed in Aberdeen, S.D. and is expected to be completed in March 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5930).

Martin Marietta Baltimore Aerospace, Baltimore, Md., is being awarded a **$5,695,801** firm-fixed-price contract for MK 41 vertical launching systems for CG-47, DD-963 and DDG-51 class ships. Work will be performed in Baltimore and is expected to be completed in December 1988. The

(continued)

U.S. NAVY

CURRENT NAVY, COAST GUARD & MARAD OVERHAUL, REPAIR & CONVERSION CONTRACTS AT U.S SHIPYARDS

(As of October 1987)

SHIPYARD	SHIP	TYPE OF WORK	$VALUE	COMP
Alabama Dry Dock	AVT-16, USS Lexington	PM	10,131,466	8/90
Avondale Shipyards	FFG-28, USS Boone	SRA	9,998,452	7/88
	FFG-32, USS John J. Hall	DSRA	11,170,581	9/88
Bath Iron Works	4 USCG Cutters	ROH	117,452,000	89
	FF-1044, USS Brumby	ROH	14,501,392	4/88
Bender Shipbuilding	USNS Sirius, MSC Ship	ROH	6,428,920	1/88
Bethlehem Steel-Port Arthur	SS Buyer, MarAd Ship	UPG	2,018,745	—
Charleston Naval Shipyard	SSBN-619, USS Andrew Jackson	OH	112,058,684	3/90
	SSBN-624, USS Woodrow Wilson	OH	120,928,007	3/89
Colonnas' Shipyards	2 USCG Cutters, Courageous & Durable	MMA	11,961,478	12/87
Continental Maritime	DDG-7, USS Henry B. Wilson	SER	4,987,211	10/87
	DDG-12, USS Robison	SER	5,551,864	12/87
	CV-64, USS Constellation	REP	8,100,000	—
Detyens Shipyards	ARDM-2, USS Alamogordo	ROH	4,243,424	2/88
Electric Boat-G.D.	SSN-719, USS Providence	SRA	6,100,000	12/87
Gee Marine Diesel	AE-23, USS Nitro	DSRA	3,577,588	11/87
General Ship Corp.	FF-1075, USS Trippe	ROH	8,801,078	5/88
	FFG-29, USS Stephen W. Graves	EDSRA	10,969,490	6/88
Honolulu Shipyard	ARS-42, USS Reclaimer	ROH	3,312,606	1/88
Houston Ship Repair	SS Buyer (RRF)	UPG	2,018,745	—
Ingalls Shipbuilding	FFG-31, USS Stark	REP	12,336,102	10/87
	BB-64, USS Wisconsin	MOD	221,762,170	10/88
	CG-53, USS Mobile Bay	PSA	17,500,000	2/88
Jonathan Shipyard	USS Saginaw	PM	9,900,000	6/90
Long Beach Naval Shipyard	LPH Class Ships	PM	8,096,132	10/90
McDermott Inc.	IX-513 Barge	MODIF	7,422,802	4/88
Metro Machine	Atlantic Fleet LPDs	PM	5,334,400	8/91
	FF-1079, USS Bowen	OH	6,900,000	—
NASSCO	4 LSTs	PM	3,500,000	90
	3 LSTs	MAINT	5,858,543	—
	DD-966, USS Hewitt	ROH	26,619,695	4/88
	DD-965, USS Kinkaid	ROH	23,499,988	1/88
	AOE-1, USS Sacramento	ROH	19,977,007	12/87
	DD-967, USS Elliot	ROH	27,779,349	9/88
Newport News Shipbuilding	SSBN-643, USS George Bancroft	OH	19,400,000	3/88
	SSN-721, USS Chicago	PSA	31,000,000	10/87
	SSN-750, USS Newport News	PSA	3,400,000	1/89
	Surface Ship Support Barge	REP	42,650,899	7/89
	SSN-723, USS Oklahoma City	PSA	3,367,692	9/88
Norfolk Shipbuilding	AO-178, 179 & 186	PM	38,900,000	—
	T-ACS-4, Gopher State	CONV	15,653,333	10/87
	T-ACS-5, Flickertail State	CONV	15,653,333	12/87
	T-ACS-6, Cornhusker State	CONV	15,653,333	2/88
	AD-38, USS Puget Sound	ROH	12,210,546	5/88
	FF-1097, USS Moinester	ROH	4,538,545	1/88
	AFDM-10, USS Resolute	ROH	9,200,000	—
	AS-31, USS Hunley	DSRA	4,400,000	12/87
	Mormacsea & Mormacsaga (RRF)	UPG	7,973,482	—
Northwest Marine Iron Works	LSD-36, USS Anchorage	ROH	15,800,000	—
	DD-964, USS Paul Foster	ROH	26,423,466	5/88
	RO/RO Paralla, RRF Ship	OH	4,000,000	10/87
Pacific Dry Dock	ARS-38, USS Bolster	ROH	3,324,000	11/87
Pennsylvania Shipbuilding	FFG-11, USS Clark	SRA	3,420,709	12/87
	AFDM-7, USS Sustain	ROH	5,500,000	2/88
	FF-1061, USS Patterson	PM	$5-10 mil./yr.	—
Philadelphia Naval Yard	CV-62, USS Independence	SLEP	240,000,000	—
Phillyship	CG-19, USS Dale	PRA	7,994,080	2/88
Portsmouth Naval Yard	SSBN-645, USS James K. Polk	OH	135,000,000	87
	SSBN-642, USS Kamehameha	ROH	112,100,000	11/88
Puget Sound Naval Yard	CVN-68, USS Nimitz	REP & OH	—	89
	SSBN-617, USS Alexander Hamilton	ROH	110,713,798	11/88
	USS Scamp, 2 other submarines	DEACT	—	87-88
Robert E. Derecktor	FFG, USS Connole	ROH	2,500,000	—
Service Engineering	T-AFS-9, USNS Spica	OH	10,700,000	—
	AE-29, AE-32, AE-33 & AE-34	PM	4,154,000	89
	LPD-2, USS Vancouver	ROH	13,280,669	2/88
Southwest Marine	LPD-8, USS Dubuque	OH	10,000,000	—
	AOR-3, USS Kansas &,AOR-1, USS Wichita	REP	41,600,000	—
	LST-1186, LST-1191 & LST-1185	OH	35,000,000	87-89
	LSD-42, USS Germantown	PSA	3,938,165	11/87
	AD-15, USS Prairie	SRA	7,156,797	1/88
	FFG-9, USS Wadsworth	SRA	4,487,998	10/87
	LPH-3, USS Okinawa	ROH	16,114,285	7/88
	FF-1053, USS Roark	PMA	3,531,443	12/87
Tacoma Boatbuilding	CVN-78, USS Nimitz	SRA	3,895,000	11/87
	USNS Hayes (T-AG)	CONV	33,878,232	11/89
Tampa Shipyards	T-ACS 7 & 8, RRF Ships	CONV	43,158,333	10/88
Todd-Galveston	C-5 (T-AVB)	CONV	27,500,000	87
Todd-San Francisco	LPH-2, USS Vancouver	ROH	15,333,350	10/87
Todd-San Pedro	ARS-38, USS Bolster	ROH	4,572,293	2/88
Todd-Seattle	8 WHECs	OH	234,903,000	2/91
USCG-Curtis Bay	14 buoy tenders	SLEP	8,500,000	—
	16 WMECs	MAINT	—	—

Legend: CONV-Conversion; DEACT-Deactivation; DSRA-Docking Selected Restricted Availability; EDSRA-Extended Docking Selected Restricted Availability; MAINT-Maintenance; MODIF-Modification; MMA-Major Maintenance Availability; OH-Overhaul; PM-Phased Maintenance; PMA-Phased Maintenance Availability; PSA-Post-Shakedown Availability; REP-Repair; ROH-Regular Overhaul; SER-Service; SLEP-Service Life Extension Program; SRA-Selected Restricted Availability; UPG-Upgrade.

Major Navy Contracts

(continued)

Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5929).

Martin Marietta Baltimore Aerospace, Baltimore, Md., is being awarded a **$32,599,806** modification to a previously awarded firm-fixed-price contract for Engineering Change Proposals (ECP) to the MK 41 vertical launching system for CG-47, DD-963 and DDG-51 class ships. Work will be performed in Baltimore and is expected to be completed in March 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5504).

Southwest Marine of San Francisco, San Francisco, Calif., is being awarded a **$3,531,443** firm-fixed-price contract for the Phased Maintenance Availability of USS Roark (FF-1053). Work will be performed in San Francisco and is expected to be completed December 24, 1987. The Supervisor of Shipbuilding, Conversion and Repair, San Francisco, Calif., is the contracting activity (N00024-85-H-8220).

August 24

RCA Corporation, Moorestown, N.J., is being awarded a **$25,000,000** modification to a previously awarded cost-plus-fixed-fee contract for engineering services for the Aegis shipbuilding program. Work will be performed in Moorestown and is expected to be completed in September 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-83-C-5114).

August 28

General Electric Company, Washington, D.C., is being awarded a **$35,644,755** firm-fixed-price contract for main propulsion complexes for SSN-688 class submarines. Work will be performed in Lynn, Mass. (70 percent) and Fitchburg, Mass. (30 percent) and is expected to be completed in March 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-4098).

August 31

Westinghouse Electric Corporation, Baltimore, Md., is being awarded a **$3,782,689** modification to a previously awarded firm-fixed-price contract for solid state transmitter field changes for the AN/SPS-40B/C/D radar. Work will be performed in Baltimore and is expected to be completed in December 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7190).

Vitro Corporation, Silver Spring, Md., is being awarded a **$35,580,124** cost-plus-fixed-fee contract for Tarter weapon system integration agent and weapon direction system design agent functions for CGN-36, CGN-38 and DDG-993 class ships. Work will be performed in Silver Spring and is expected to be completed September 30, 1993. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5141).

September 1

Alice Tankships Corporation, a subsidiary of Maritime Overseas Corporation, New York, N.Y., is being awarded a **$31,938,167** firm-fixed-price contract for the time charter of M/V Overseas Alice, a U.S.-flag tanker. The ship will be used for the worldwide ocean transportation of bulk petroleum and service in the Afloat Prepositioning Force for the Department of Defense. The contract performance period is 17 months with two additional 17 month options. Delivery will be between September 1 and November 30, 1987. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-87-C-1700).

Valdez Tankships Corporation, a subsidiary of Maritime Overseas Corporation, New York, N.Y., is being awarded a **$31,938,167** firm-fixed-price contract for the time charter of M/V Overseas Valdez, a U.S.-flag tanker. The ship will be used for the worldwide ocean transportation of bulk petroleum and service in the Afloat Prepositioning Force for the Department of Defense. The contract performance period is 17 months with two additional 17 month options. Delivery will be between September 1 and November 30, 1987. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-87-C-1701).

Vivian Tankships Corporation, a subsidiary of Maritime Overseas Corporation, New York, N.Y., is being awarded a **$31,938,167** firm-fixed-price contract for the time charter of M/V Overseas Vivian, a U.S.-flag tanker. The ship will be used for the worldwide ocean transportation of bulk petroleum and service in the Afloat Prepositioning Force for the Department of Defense. The contract performance period is 17 months with two additional 17 month options. Delivery will be between September 1 and November 30, 1987. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-87-C-1702).

(continued)

Major Navy Contracts

(continued)

September 2

IBM Corporation, Federal Systems Division, Manassas, Va., is being issued a **$9,960,150** firm-fixed-price order to furnish 242 spare parts for shipboard advanced signal processors. Work will be performed in Manassas and is expected to be completed in December 1989. The Navy Ship Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00024-86-C-5212).

Todd Pacific Shipyards Corporation, Los Angeles Division, San Pedro, Calif., is being awarded a **$4,572,293** firm-fixed-price contract for regular overhaul of USS Bolster (AR-38). Work will be performed in San Pedro and is expected to be completed February 26, 1988. The Supervisor of Shipbuilding, Conversion and Repair, Long Beach, Calif., is the contracting activity (N00024-85-H-8237).

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., is being awarded a **$12,210,546** firm-fixed-price contract for regular overhaul of USS Puget Sound (AD-3800. Work will be performed in Norfolk and is expected to be completed May 13, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8195).

September 4

Raytheon Company, Submarine Signal Division, Portsmouth, R.I., is being awarded a **$4,185,003** modification to a previously awarded contract for AN/BSY-1 fleet spares for various SSN-688 class submarines. Work will be performed in Portsmouth and is expected to be completed in December 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6140).

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., is being awarded a **$42,650,899** modification to a previously awarded fixed-price-incentive contract for the repair and alteration of the Surface Ship Support Barge (SSSB). Work will be performed in Newport News and is expected to be completed July 14, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2078).

September 9

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., is being awarded a **$4,538,545** firm-fixed-price contract for Regular Overhaul of USS Moinester (FF-1097). Work will be performed in Norfolk and is expected to be completed January 15, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8195).

Raytheon Company, Electromagnetic Systems Division, Goleta, Calif., is being awarded a **$40,694,000** fixed-price-letter contract for AN/SLQ-32(V) countermeasures systems for various ships. Work will be performed in Goleta and is expected to be completed in April 1991. This contract combines purchases for the U.S. Navy (97 percent), Turkey (2.4 percent) and Australia (.4 percent) under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5013).

September 10

Raytheon Company, Equipment Division, Wayland, Mass., is being awarded a **$11,560,200** modification to a previously awarded contract for incorporation of approved Engineering Change Proposals (ECPs) to manufacture and install enhanced battleshort and shock hardening modification kits for Aegis SPY-1A transmitter groups for CG-47 through CG-52 and CG-54 through CG-58. Work will be performed in Wayland and Waltham, Mass. (85 percent) and is expected to be completed June 30, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-C-5124).

Westinghouse Electric Corporation, Baltimore, Md., is being awarded a **$6,123,000** modification to a previously awarded firm-fixed-price contract for solid state transmitter field changes for the AN/SPS-40B/C/D radar. Work will be performed in Baltimore and is expected to be completed in December 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7190).

General Dynamics Corporation, Pomona Division, Pomona, Calif., is being awarded a **$5,164,123** modification to a previously awarded fixed-price-incentive contract for two Phalanx Close-In Weapon Systems. Work will be performed in Pomona and is expected to be completed in September 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5456).

Samuel L. Fagin Associates, Wynnewood, Pa., is being awarded a **$3,838,883** cost-plus-fixed-fee contract to design, develop, document, test and support Landing Craft-Air Cushion (LCAC) Command, Control and Navigation (C N) system operational software. Work will be performed in Wynnewood and is expected to be completed in September 1992. The Naval Air Development Center, Warminster, Pa., is the contracting activity (N62269-87-C-0018).

September 17

FMC Corporation, Minneapolis, Minn., is being awarded a **$4,995,957** modification to a previously awarded firm-fixed-price contract for Vertical Launch System (VLS) ancillary equipment for CG-47, DDG-51 & DD-963 class ships. Work will be performed in Minneapolis and is expected to be completed in August 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5505).

Sanders Associates, Hudson, N.H., is being awarded a **$10,991,300** firm-fixed-price contract for AN/RD-7 direction finding systems for various U.S. submarines. Work will be performed in Hudson and is expected to

be completed October 1, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5020).

September 18

Litton Systems Incorporated, Electron Devices Division, San Carlos, Calif., is being awarded a **$3,665,000** order against a basic ordering agreement to furnish 19 electron traveling wave tubes of one frequency and 30 electron traveling wave tubes of a different frequency in support of the SLQ-17 radar system. Work will be performed in San Carlos and is expected to be completed in July 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (F040606-87-G-0137).

Westinghouse Corporation, Oceanic Division, Bala Cynwyd, Pa., is being awarded a **$6,178,587** delivery order against a basic ordering agreement for 15 line items to support and repair the AN/AQS-14-AMCM minesweeping system for shipboard use. Work will be performed in Annapolis, Md. and is expected to be completed in October 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-A090).

Dohrman Machine Products Incorporated, Emerson, Neb., is being awarded a **$4,187,736** modification to a previously awarded firm-fixed-fee contract for two additional modular cargo delivery systems. Work will be performed in Emerson and is expected to be completed in November 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-2084).

Bender Awarded $6.4-Million Contract For MSC Ship Overhaul

Bender Shipbuilding and Repair Company, Mobile, Ala., was recently awarded a $6,428,920 firm-fixed-price contract for the drydocking and overhaul of the U.S.N.S. Sirius, a Military Sealift Command combat stores ship. The work is being performed in Mobile and is expected to be completed in February 1988.

New Company To Furnish U.S. Navy Hardware —Literature Available

HMS Marine Hardware, Inc. has been formed for the specific purpose of providing certified hardware for the needs of U.S. Navy new ship construction, ship overhaul, and habitability requirements.

HMS Marine Hardware offers U.S. Navy specification heavy-duty joiner door locksets, latchsets, hinges, closers, holdback hook and bumpers, plus sanitary space hardware including watercloset hinges, coat hook and bumpers, latch and keepers etc.

These hardware items are furnished with the proper applicable certifications as required by NavSea drawings and specifications. These certifications require these hardware products to be in accordance with specific military and federal documents.

For more information and free literature on HMS Marine Hardware,

Circle 53 on Reader Service Card

USMMA Will Dedicate New Alumni Facility

A new administrative operations center for the U.S. Merchant Marine Academy (USMMA) Alumni Association was recently dedicated to honor the benificence of **James A. Babson** of Winnetka, Ill., and his mother, **Ethel N. Babson,** now deceased.

Mr. Babson, a 1944 Academy graduate, and his mother have been longtime supporters of the USMMA Alumni Foundation, which is dedicated to underwriting programs that enhance the educational and recreational life of Academy midshipmen and which are not federally funded.

The Babson Alumni Center will be a new facility for the administrative operations of the Alumni Association of the federal school. It will be located on the Academy's campus in Kings Point, Long Island, N.Y.

Ingalls photo

Aegis Missile Cruiser 'Leyte Gulf,' 100th GE-Powered U.S. Navy Ship, Delivered By Ingalls Shipbuilding

The USS Leyte Gulf, a Ticonderoga (CG 47) class Aegis guided missile cruiser, and the 100th U.S. Navy ship powered by GE LM2500 engines, was recently signed over to the U.S. Navy by Ingalls Shipbuilding Division of Litton. The USS Leyte Gulf will be part of the Navy's seventh fleet and will operate out of Mayport, Fla.

Admiral **Metcalf,** Deputy of Naval Operations for Surface Warfare, described the USS Leyte Gulf as "pound for pound, the most potent warship afloat."

The cruiser is equipped with the most sophisticated radar and weapon systems available, including the Aegis radar detection, tracing, and fire control system.

Powered by four LM2500s, the USS Leyte Gulf is capable of speeds in excess of 30 knots.

The LM2500 has been selected by the U.S. Navy and 16 other navies around the world for applications including patrol hydrofoil missileships, guided missile frigates, Spruance (DDG 963) and Kidd (DDG 993) class destroyers, and the new Arleigh Burke (DDG 51) class Aegis destroyers.

On-shore applications for the LM2500 include electrical power generation, cogeneration, electrical drives, and gas and oil pipeline transmission. More than 800 LM2500s have been sold or ordered for marine and industrial applications around the world.

For more information and free literature on the GE LM2500,

Circle 17 on Reader Service Card

Navy Reports Stark Repair To Cost $142 Million

Damage to the frigate USS Stark (FFG-31), hit by an Iraqi Exocet missile while on partrol in the Persian Gulf last summer, was estimated by the Navy to be as much as $142 million.

Litton Industries' Ingalls Shipbuilding, Pascagoula, Miss., was awarded a first-phase repair contract worth $12,336,102.

The Navy expects the repairs to be completed in August 1988.

Rockwell Wins Navy Communications Contract

Rockwell International Corporation's Collins Defense Communicatons has been awarded a $24.1-million contract to produce its AN/ARC-182 UHF/VHF radio systems for the U.S. Navy.

Designed for use aboard Navy tactical aircraft, the AN/ARC-182 combines the communications capabilities of four radios to completely integrate communications for close air support, air traffic control, military/NATO forces, and maritime operations.

Portland Yard Wins LSD Overhaul Contract Worth $15.8 Million

Northwest Marine Iron Works Co., Portland, Ore., was the lowest bidder, $15.8 million, in the competition for the overhaul of the amphibious dock landing ship Anchorage (LSD-36).

Coast Guard To Change Vessel Drydock Rules

According to a recent report, the U.S. Coast Guard will extend the intervals between which shipowners are required to put their vessels into drydock for tail shaft examinations. The change would result in a reduction in costs to the maritime industry.

The Coast Guards stated that the changes would bring their requirements into closer accord with the regulations of classification societies and those being considered for adoption internationally.

The Coast Guard has requested that comments on possible further revisions on the new "interim final rules" should be submitted prior to January 21.

New Amendment May Help U.S. Yards

The Senate has unanimously agreed to pass an amendment to the fiscal 1988 Defense Authorization Bill, which would allow the Navy to enter into long-term U.S.-built tanker charters and which may help increase business for U.S. shipyards.

The amendment, which was introduced by Sen. **Peter Wilson** (Calif.-R), would allow the Navy to charter tankers for a longer period of time than the present 18-month maximum. The increase in the charter time would create the opportunity for a "build-and-charter-type" program.

"The private sector will build, the taxpayers will lease," said Senator **Wilson.** "It is a very good arrangement for both."

Furthermore, Senator **Wilson** noted that short-term contracts, which were imposed in the late seventies, ranged between about $6 million to $11 million per ship, whereas long-term charters for the same vessels would be only about $2 million apiece.

JJH Inc. Announces Key Personnel Additions

Daniel Weiler, vice president and general manager of JJH Inc.'s Washington office, a leading naval engineering firm located in Crystal City, Va., has announced the addition of several key people to his staff.

Robert J. Riggins has been appointed to the position of head of ship design and fleet support. Before joining JJH Inc., he was the ship design director for NavSea, where he performed and directed design work for submarines, surface ships, aircraft carriers, amphibious ships, hydrofoils and surface effect craft for the past 28 years. His technical specialties include design of deck systems, hydraulic power systems, ship hydrodynamics and aerodynamics, and ship motions.

Erwin K. Straubinger has been appointed to the position of senior project engineer. He recently supported the Naval Sea Systems Command Ship Design Group in the development of ship design policies and procedures documentation. Prior to that, he worked as the acting director, Naval Architecture Sub-Group and as the director, Weight Division, where he supervised preparation and evaluation of weight estimates, formulated weight control policy and weight engineering criteria, and sponsored research and technology tasks associated with weight engineering.

Victor R. Burnett Jr. has been appointed to the position of naval architect. He will be directly responsible for the development of documentation defining ship design process policy and procedures. He has over 34 years' experience in the ship design and specification field at NavSea with his most recent position being director, Engineering Standards Sub-Group responsible for the development of ship and equipment specifications and standards as well as data management.

Norshipco Completes Gopher State Conversion —Naming Ceremony Held

The SS Gopher State (T-ACS 4) was recently named at a ceremony at Norfolk Shipbuilding & Drydock Corp.'s Berkley Plant in Norfolk, Va.

Norfolk Shipbuilding & Drydock Corp. (Norshipco) converted the 610-foot ship, previously called the Export Leader, from a container ship to an auxiliary crane ship under a contract from the U.S. Maritime Administration for the Department of the Navy. The Gopher State, part of the Reserve Fleet anchorage in the James River near Fort Eustis, will be operated by the U.S. Navy's Military Sealift Command.

For free literature on the shipbuilding and ship-repairing services of Norshipco,

Circle 79 on Reader Service Card

George G. Sharp Awarded $4.8-Million Contract

The Maritime Administration has awarded a contract valued at up to $483,862 to George G. Sharp, Inc., 100 Church St., New York, N.Y., to provide technical marine support services during the conversion of two National Defense Reserve Fleet containerships into U.S. Navy Auxiliary Crane Ships (T-ACS 7-8). A contract was awarded in September to Tampa Shipyards, Inc., Tampa, Fla., for conversion of the President Truman and American Builder.

George G. Sharp, Inc., will assist MarAd's construction representative at the shipyard by providing the services of a logistic support inspector, hull inspector, electrical inspector, machinery inspector, logistics support clerk and office manager/coordinator, for a period of up to 16 months.

When converted, the vessels will become part of the Ready Reserve Force maintained by MarAd and funded by the Navy.

New USCG patrol craft employ Electrocatalytic's Capac system for hull protection.

New U.S. Coast Guard Patrol Craft Employ Electrocatalytic's Capac System Selected To Arrest Corrosion In All Natural Waters

By Paul Byrne
Electrocatalytic, Inc.

At the dock of Bollinger Machine and Shipyard, Inc. the latest in the series of "Island" Class patrol craft is being readied for sea trials. The skipper and crew look proudly at one of the finest patrol craft available today. The Island Class is based upon the 110-foot hull design offered by Vosper-Thornycroft, UK, but modified to meet the Coast Guard's exacting needs and specifications.

These patrol boats see a variety of environments in their daily activity, protecting the coastal waters of the United States. The Coast Guard and Bollinger selected the HR Series Capac, manufactured by Electrocatalytic, Union, N.J., for hull protection because these systems were proven to perform in the broad range of service conditions anticipated. Operations in warm Gulf, cold Arctic and inland waters dictated the use of reliable, stable and long-lived equipment. Coordination of the design and manufacture enables Capac to meet the five key demands of effective corrosion prevention; sensing, control, power handling, grounding and display. The silver chloride sensing electrode recognized for its high accuracy, stability and 20 year life is coupled with integrated circuit control. This control detects wiring faults as well as protecting the silver electrode during power off conditions.

Sacrificial anodes that can supply electrical current to the underwater hull and appendages to counteract and suppress corrosion could have been specified for cathodic protection. However, the design specification required impressed current protection because of its lighter weight and recognized cost advantage over sacrificial anodes. The Capac system weighs just 400 pounds and compares in ampere availability to 90 sacrificial anodes which weigh nearly a ton. Both weight and drag are important for this 160-ton, 25-knot craft.

The superior performance of Capac requires a higher initial cost, however, U.S. Government studies have shown that this cost is recovered in 3 to 5 years when compared to sacrificial anodes. This economic advantage would represent a 20 percent return on investment over the 20-year life of the vessel. Electrocatalytic, manufacturer of electrochemical systems and products that employ proprietary catalytic technology and provide their users with costs savings compared to alternate technology.

For more information and free literature from Electrocatalytic,

Circle 77 on Reader Service Card

16-Page Gems Catalog Features Solid-State Relays And Barriers

Gems Sensors Division, Plainville, Conn., recently published a new 16-page catalog describing solid-state Safe-Pak and Zener Barriers that protect instrumentation or equipment in potentially hazardous areas.

The units render non-voltage producing sensors intrinsically-safe. Used within a system, they provide safe operation in hazardous areas. To be certified intrinsically safe, a device or circuit must be designed so that no two simultaneous failures can cause an explosion.

Gems relays eliminate the need for costly, explosion-proof housings and prevent power shutdowns. They are designed for use with sensors monitoring flow, pressure or level, or with motor/pump starter switches, proximity switches, on/off switches etc.

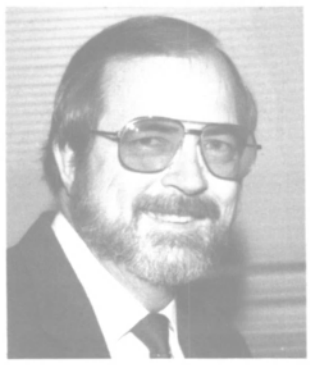
Included in the new catalog are: Programmable Safe-Pak Relays which allow optional sensing functions such as latching from a momentary closure, inverting switch functions, all programmed into a single unit. Zener Supply and Return Barriers are included which provide passive energy limiting to provide safe DC voltage levels. Latching Relays are included to provide a momentary start/stop actuation or differential control switching. Many other models are also described.

Approvals include UL, FM, CSA and MSHA, for Class I, II, Division I and II, Group A through G.

For further information and a free copy of the new catalog from Gems,

Circle 48 on Reader Service Card

NCEL Names Ashley Director, Expeditionary Facilities Division


Joseph L. Ashley

Joseph L. Ashley, a senior mechanical engineer at the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, Calif., has been promoted to director of the newly formed Expeditionary Facilities Division in the Amphibious and Advanced Base Department.

In his new position, Mr. **Ashley** will supervise 11 full-time scientists, engineers, and support personnel. As NCEL's technical center of expeditionary shelter expertise, the new division focuses on research and development of antarctic facilities and military structures.

The Princeton, recently christened at Ingalls Shipbuilding, Pascagoula, Miss., will be powered by four GE gas turbine engines. Ingalls Shipbuilding Photo

Ingalls Christens 11th Aegis Guided Missile Cruiser For Navy

CG-59 Named 'Princeton'

The 11th in a series of 15 Aegis guided missile cruisers under contract to Ingalls Shipbuilding Division of Litton Industries was recently christened Princeton (CG-59) at ceremonies at the Pascagoula, Miss., shipyard.

The principal speaker at the ceremony was the Honorable **Jim Courter,** U.S. Representative from New Jersey's 12th Congressional District and a member of the House Armed Services Committee. Mrs. **Warren William Bradley,** mother of New Jersey Senator **Bill Bradley,** was the ship's sponsor.

The Princeton is 567 feet long, with a beam of 55 feet, and displaces 9,500 tons. She is powered by four GE gas turbine engines, which power the cruiser to speeds of more than 30 knots.

The Princeton is equipped with the MK 41 vertical launching system, a multiwarfare missile launching system, capable of firing a mix of missiles against airborne, surface and underwater threats, greatly extending the ship's combat flexibility.

Other principals at the christening ceremonies included: Mrs. **Hardeman Bond,** sister of the sponsor, who served as the Matron of Honor; Ms. **Marina Gentilini,** a member of Senator **Bradley's** staff, served as Maid of Honor. Other participants included: Vice Adm. **Joseph Metcalf III,** USN, Deputy Chief of Naval Operations for Rear Adm. **James B. Greene Jr.,** USN, Aegis Shipbuilding Program Manager, Naval Sea Systems Command; **Jerry St. Pe,** senior vice president of Litton and president of the Ingalls Shipbuilding Division; and Capt. **Michael G. Simpson,** USN, Supervisor of Shipbuilding, Conversion and Repair, Pascagoula. **John Wright Coker Jr.,** minister of the First Presbyterian Church in Pascagoula, delivered the invocation.

For free literature on the shipbuilding and ship-repairing facilities of Ingalls Shipbuilding,

Circle 21 on Reader Service Card

PRINCETON
Equipment List

Propulsion gas turbines	GE
Main reduction gears	Westinghouse
Ship service generators	Stewart & Stevenson
Propellers	Bird-Johnson
Ship control systems	Litton
AN/SQS 53A & AN/SQR 19 sonars	GE
Shaft bearings	American Metal
Waste heat boiler	Combustion Engineering
Switchboards & power and lighting panels	Nelson Electric
400 Hz power supply	ALS
Radio equipment, damage control & fuel control consoles	Litton
Aegis fire control system, AN/SPY 1A radar transmitter & SPS 49 radar system	Raytheon
Advanced marine cable	Raychem
Steering gear	Jered Brown
Electrical connectors	SAE
Gauges	Weksler Instruments
Electrical backshells	Sunbank
Electrical symbol items	Henschel
Electrical cable	Collyer
Distilling plants	Aqua-Chem
F/O & L/O pumps	Warren Pumps
Refrigeration & A/C	York
Aegis seawater pump, freshwater pumps & GTG seawater pumps	Carver
Duplex strainers	CM Bailey
Control valves	Cla Val
Globe valves	Hunt Energy
Bronze gate & glove valves, deck drains & scuppers	Pima
Bronze gate & glove valves, deck drains & scuppers	Liberty
Low pressure air	Worthington
Silbrazed union end valves & buships type bronze valves	Milwaukee
Ventilation fans, turbine cooling fans & generator cooling fans	Joy Manufacturing
Fan coil assemblies	Nuclear Cooling
Generator ducts & mixing tubes	TRE
House & hose fittings	Aeroquip
Commissary equipment	HE Green
Welding electrodes & welding wire	Airco
Welding electrodes	Teledyne
Steel plate	US Steel
Steel plate	Armco

Selectro Guide Offered Free By Miller Electric

A new edition of the Arc Welding Equipment Selector Guide covers a wide rage of power sources, control/feeders, guns and welding systems and is free from Miller Electric Mfg. Co.

All models are arranged in a simplified chart arrangement enabling the user to easily locate equipment best suited to the welding process desired: SMAW (stick), GTAW (TIG), GMAW (MIG) spray transfer, GMAW (MIG) short circuit, FCAW flux cored, SAW submerged arc, ACA air carbon arc, and SW stud welding.

There are 63 different DC, AC, and AC/DC power sources listed with recommended processes and individual machine ratings for each. Seventeen models of engine driven welding generators are charted with processes, ratings, KVA figures and type of fuel for each machine. Seven models of resistance spot welders, two models of air plasma cutters are included.

Eleven models of control/feeders are given with wire sizes and types for each. Four wire feeder guns and 12 semiautomatic welding guns are described with amp ratings and duty cycles.

For more information and a free copy of the Selector Guide from Miller Electric,

Circle 30 on Reader Service Card

MonArk's new 26-foot survey boat is powered by two Outboard Marine Corp. "sea drives" rated each at 155 hp, yielding a top speed of approximately 32 knots.

MonArk Delivers Survey Boat To Corps Of Engineers

The U.S. Army Corps of Engineers in Rock Island Ill., recently took delivery of a new 26-foot survey boat designed and built by MonArk Boat Company's Workboat Division in Monticello, Ark.

The 26-footer is an all-aluminum vessel which will be used primarily for channel reconnaissance and hydrographic survey of the Mississippi River ship channel between Lock No. 22 at Saverton, Missouri and Lock No. 10 at Guttenberg, Iowa. The boat features a cathedral planing hull and is powered by two Outboard Marine Corp. (OMC) "sea drives" rated each at 155 horsepower yielding a top speed of approximately 32 knots.

In selecting the design for their new boat, the Corps of Engineers was primarily concerned with the need for a spacious enclosed cabin to house and operate the state-of-the-art survey equipment which was installed by the customer.

The large enclosed cabin, offered as a standard with the MonArk 2610-C, allowed for installation of formica work counters port and starboard, storage compartments, and an enclosed toilet.

For support during survey operations, the 26-footer is equipped with two 5-kw generators, 13,500-BTU air conditioner, depth sounder, cabin insulation, A/C and D/C electrical receptacles, and stowage compartments.

Total fuel capacity of 150 gallons allows for extended survey operations on the Mississippi without interruption for refueling.

For more information and free literature on MonArk Boat,

Circle 12 on Reader Service Card

MONARK SURVEY BOAT

Propulsion	OMC
Steering (hydraulic)	Teleflex
Depth Finder	Lowrance
Controls	Morse
Bilge Pump	Rule
Air Conditioner	Duo Therm
Generators	Honda
Wipers	American Bosch
Ship to Shore	Marinco
Horn	AFI
Fendering	Johnson Rubber
Seating	Wise
Navigation Lights	Aqua Signal
Searchlight	Jabsco

Principals at the christening ceremony included (First row, L to R): Mrs. **Paul A. Schneider,** and **Paul A. Schneider,** Executive Director, Amphibious, Auxiliary, Mine and Sealift Ships Directorate, NAVSEA; Mrs. **Paul D. Hurst; E.L. Gibson;** Congresswoman **Lindy Boggs** (La.); flower girl **Linde Miears;** Mrs. **Walter C. Diehl,** sponsor of the ship; Ms. **Mary E. Kreppel,** matron of honor; **Walter C. Diehl;** and Mrs. **Peter J. Rots.** (Second row, L to R): Capt. **W.C. Pfister,** Program Manager, NAVSEA; Capt. **E.L. Gibson,** USN Commander, Fast Sealift Squadron One, New Orleans; Capt. **Paul D. Hurst,** Supervisor of Shipbuilding, Conversion and Repair, New Orleans; **John A. Pendergrass,** Ass't Secretary for Occupational Safety & Health, U.S. Dep't of Labor; Mrs. **John A. Pendergrass; Richard F. Brunner,** executive VP and COO, Avondale Industries, Inc.; and Rear Adm. **Peter J. Rots,** Commander, Eighth Coast Guard District.

Avondale Christens Fleet Oiler Walter S. Diehl For U.S. Navy

—Free Literature Offered—

The Walter S. Diehl, T-AO-193, the fifth in a series of seven fleet oilers under construction at Avondale Industries' Shipyards Division, Avondale, La., for the U.S. Navy, was recently christened. She is scheduled for delivery to the Navy in 1988.

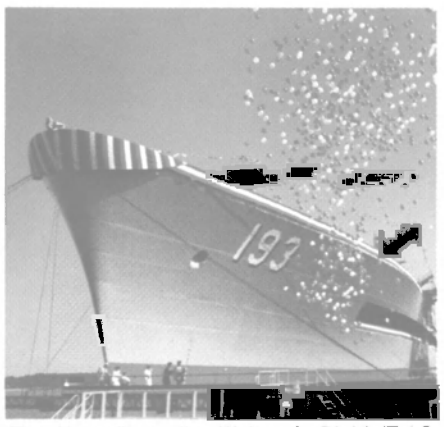
The principal speaker at the christening ceremony was the Honorable **Lindy Boggs,** U.S. Representative, 2nd Congressional District, Louisiana. Mrs. **Walter C. Diehl,** daughter-in-law of the ship's namesake, served as the ship's sponsor.

The welcoming address was delivered by **Richard F. Brunner,** executive vice president and chief operating officer, Avondale Industries, Inc. Capt. **Paul D. Hurst,** USN, Supervisor of Shipbuilding, Conversion and Repair, New Orleans, introduced the special guests in attendance.

Other speakers at the christening were: the Honorable **John A. Pendergrass,** Assistant Secretary of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor; **Paul A. Schneider,** Executive Director, Amphibious, Auxiliary, Mine and Sealift Ships Directorate, Naval Sea Systems Command; and Capt. **E.L. Gibson,** USN, Commander, Fast Sealift Squadron One, New Orleans.

Other christening participants included: Mrs. **Mary E. Kreppel,** who served as the Matron of Honor; flower girl **Lundie Miears,** daughter of an Avondale employee; and Lt. **Michael P. Garvey,** Chaplain Corps, USN Reserve, delivered the invocation.

The Walter S. Diehl is 667½ feet long, 97½ feet wide and has a maximum draft of 36 feet. She is powered by twin 10-cylinder, medium-speed PC4.2 Colt-Pielstick diesel engines, which produce 16,300 hp each. She will have a service speed of 20 knots. The oiler's twin-screw propeller design provides improved directional stability, ease of control and mission reliability under combat conditions.



The Navy fleet oiler Walter S. Diehl (T-AO-193) was recently christened at ceremonies held at Avondale Shipyards Division in Avondale, La. She is powered by two medium-speed, 10-cylinder PC4.2 Colt-Pielstick diesel engines.

The mission of the Walter S. Diehl, as well as her sister ships of the T-AO-187 Class, is the transportation of bulk products from shore depots to combatants and support forces under way. The oilers also deliver limited fleet freight, cargo, water, mail and personnel.

Cargo-underway-replenishment is accomplished using transfer rigs with transfer hoses suspended by a span wire that is automatically maintained in a constant tension range. The T-AO 187 Class vessels are also capable of refueling helicopters from a vertical-replenishment facility aft of the accommodation house.

For free literature on the shipbuilding and ship-repairing facilities and services of Avondale,

Circle 20 on Reader Service Card

MAN GHH Obtains ASME Certificates

MAN GHH has been qualified by the American Society of Mechanical Engineers (ASME) for the construction of nuclear components in the primary loop (N Stamp), erection of primary loop components (NA Stamp), and manufacture of primary-loop items (NPT Stamp).

MAN GHH is now qualified in all countries of the world to manufacture, erect, and repair complete nuclear components and component items according to the ASME Code, and is fully geared and qualified to build pressure vessels according to the ASME Code for both the conventional and nuclear sectors.

For more information and free literature from MAN GHH,

Circle 57 on Reader Service Card

Avondale Constructing Steel Box Girders To Diversify Operations

Avondale Shipyards, Inc., New Orleans, La., in an effort to diversify its operations, has negotiated a contract to construct steel box girders for a new bridge in Denver, Colo.

MarAd Awards B&A Marine $3.5-Million Contract

The Maritime Administration has awarded a $3,474,555 contract to B & A Marine Co., Inc., 75 Huntington St., New York, N.Y., for maintenance and repair work and sealift enhancements to Ready Reserve Force (RRF) cargo vessel Cape Avinof.

The maintenance and repair work includes drydocking, sandblasting and painting. Sealift enhancements include the installation of a helicopter deck. The work is expected to be completed in approximately three months.

The RRF consists of National Defense Reserve Fleet vessels capable of being activated for sealift operations on five to ten days' notice. It is a joint program of MarAd and the U.S. Navy. Funding for the contract is being provided by the Navy.

ASNE To Present Annual Awards At Centennial Celebration In May 1988

The American Society of Naval Engineers (ASNE) recognizes outstanding members of the naval engineering community through its annual awards program. These awards will be presented at the Society's annual meeting in Washington, D.C., the first week of May, which will mark ASNE's centennial celebration.

Each year consideration is given to the following awards: **Gold Medal Award,** given to an individual who has made a most significant engineering contribution either through personal effort or through the direction of others during the past five years; **Solberg Award,** presented to an individual who has made a most significant contribution to naval engineering through personal research during the past three years; **Harold E. Saunders Award,** presented to an individual whose reputation in naval engineering spans a long career of notable achievement and influence; and the **Claud A. Jones** award, presented to an individual who has made significant contributions to improving operational engineering or material readiness to maritime defense forces during the past three years.

Siemens Off-Delay Timing Relays Are Compact, Reduce Panel Space

Siemens 7PU electronic off-delay timing relays are compact to reduce panel space when used in control, starting and protection circuits for switching operations involving off-delay timing functions. They feature long life of 30 million operations, accuracy of ±1% and less than 3% drift.

Siemens 7PU timing relays are UL-listed and meet NEMA, VDE, CSA and IEC standards. They are suited for conventional panel mounting or integral DIN snap-on rail mounting.

Siemens electronic timing relays rated operating voltages are 24, 120 and 240, 60 Hz and 24, 110 and 220, 50 Hz. Operating time ranges from 0.06 to 15 seconds and is adjusted steplessly by means of a rotary knob.

The Controls Division of Siemens Energy & Automation, Inc., manufactures and markets motor control centers, medium voltage controllers and a full line of control products including contactors, overload relays and starters. Headquartered in Atlanta, Siemens Energy & Automation manufactures electrical and electronic equipment and systems for electric utilities, commercial and residential construction and general industry. A member of the Siemens Group, the company's products are marketed worldwide.

For more information and free literature from Siemens,

Circle 52 on Reader Service Card

Contromatics Introduces New High-Pressure Ball Valves—Literature Available

The Contromatics Commercial Division recently introduced downstream-seal, three-piece, two-way, ¼-inch through 2-inch B Series 3,000-5,000 psi, −20° F to 180° F ball valves with long-life, low-friction Delrin AF® seats and lower stem seals.

The new high-pressure Contromatics ball valves feature 316 stainless steel balls and 17-4 PH stems. The downstream seals minimize seat damage and lower torque. The self-compensating stem allows for normal wear and temperature fluctuations. The three-piece design minimized installed cost, while the drop-in center section design reduces in-line maintenance costs.

Contromatics quarter-turn high-pressure ball valves also feature a double locknut, high-rise handle for easy manual operation. For automatic operation, Contromatics high-pressure ball valves may be furnished with pneumatic and electric actuators.

Standard construction materials are carbon steel. Options include choice of Buna, EPR, Viton, and Neoprene body seals.

For more information and free literature from Contromatics,

Circle 55 on Reader Service Card

Third Chesapeake Marine Engineering Symposium Set For January 1988

The Third Chesapeake Marine Engineering Symposium, sponsored by the Chesapeake Section of SNAME every two years, is to be held at the Sheraton National Hotel in Arlington, Va., on January 28, 1988, in conjunction with the joint meeting of SNAME and ASNE on January 27.

The purpose of this symposium is to provide a forum for technical presentations, discussions and dialogue concerning the field of marine engineering. Papers will be presented in four areas of specialization: survivability; propulsion/electrical; operation and maintenance; and fluid systems/firefighting.

The registration cochairmen are Lt. Comdr. **Jeffrey Lantz,** USCG, and Lt. Comdr. **John Grenier,** USCG. Reservations can be made by calling either at (202) 267-0577.

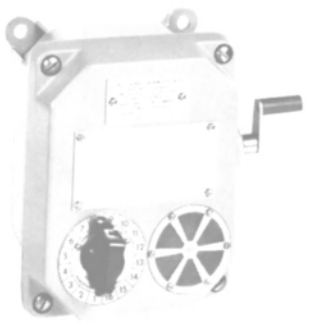
GO NAVY

With H McC

Hose-McCann Telephone Co., Inc., originators and pioneers of Sound Powered telephones for marine use, has expanded their product line to include a wide variety of U.S. Navy Electrical and Mechanical products. An assortment of these products are shown here. All Hose-McCann Navy Products are manufactured, tested, and qualified in accordance with the latest Military specifications.

Please call or write for further information and specifications on these or any other Navy Products.

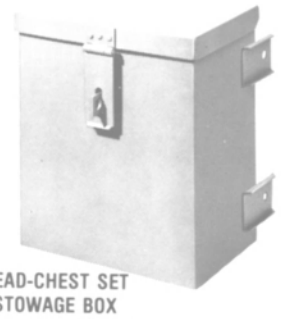
CALL SIGNAL
STATION IC/D
Symbol No. 2988



SOUND-POWERED
TELEPHONE
JACK BOX
G15A/B/C

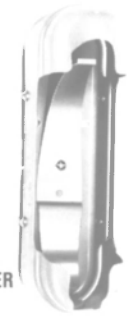
SOUND-POWERED
TELEPHONE
HANDSET
H203/U

SOUND-POWERED
TELEPHONE PLUG
H39A

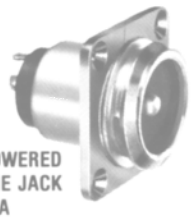


HEAD-CHEST SET
STOWAGE BOX
Symbol No. 2924.1
(1 to 6 Compartments)

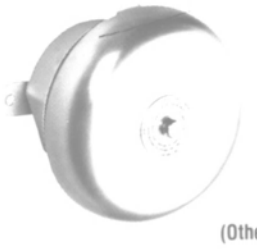
SOUND-POWERED
HEAD-CHEST
H200/U
H202/U



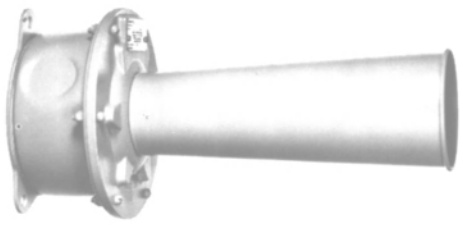
HANDSET HOLDER
Z33A/B



SOUND-POWERED
TELEPHONE JACK
H27A



ALARM BELLS
& BUZZERS
IC/B2S4
(Other types available)



HORNS & SIRENS
IC/H1S4
(Other types available)

HOSE-McCANN
TELEPHONE CO., INC.

9 SMITH STREET ■ ENGLEWOOD ■ NEW JERSEY 07631
PHONE 201-567-2030 ■ CABLE ADDRESS: HOSETELCO ■ TELEX NO. 642837

ORIGINATORS AND PIONEERS OF SOUND POWERED TELEPHONES FOR MARINE USE

Circle 142 on Reader Service Card

Check on us!

The Shipbuilders of Spain

As a shipowner, it's no news for you that the world wide shipbuilders crisis has left you with all the odds on your side.

So, more than ever you are in an excellent position to make business with the shipyards that have survived.

And you can count them with the fingers of your hands. But if you are after an specific project, probably just one hand will be enough.

Right in the middle of this tough competition, the Spanish offer is one of the best.

Check on us, as others do.

For example, one of our recent contracts puts Astilleros on the countdown to deliver "the ultimate XXth century tanker" (the quotation is not ours), a 140.000 Suez-Max, to the French CNN, for operation by Elf-Acquitaine. Incidentally, Astilleros won this contract after breathtaking competition with leading Japanese and Korean yards.

There are other contracts to show you that things are happening —and happening fast— at Astilleros. As a reader of the trade press you already know.

So, check on us. Our competitive mix includes:

✓The best price.
✓The most sophisticated — some call it creative— financial packages.
✓High, medium or standard technology, the choice is up to you.
✓Wide-spread tonnage capacities in nine complementary shipyards.
✓And flexibility, great flexibility!

What others have learnt the hard way, has been our own way of doing business from the very start.

Don't you feel its high time to check on us?

ASTILLEROS ESPAÑOLES

check on us ✓

For further information: Astilleros Españoles S.A.
Padilla, 17
28006 Madrid
Tel. (341) 435 78 40
Telex. 27648 ASTIL-E
Fax. (341) 276 29 56

PROPULSION UPDATE

Wartsila Introduces The Vasa GD, New Gas-Diesel Engine

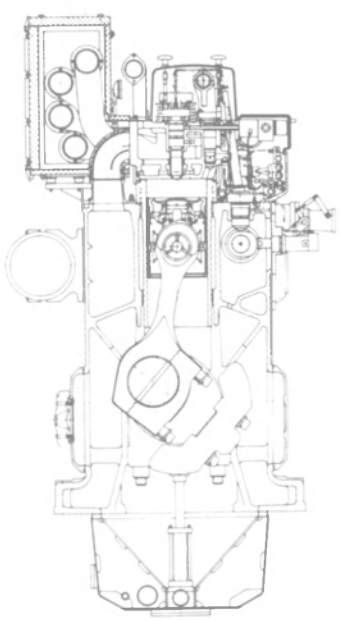
—Literature **Available**—

The latest achievement in the development of the Wartsila Diesel engine range is the Wartsila Vasa GD, a new gas-diesel engine that can operate on a wide variety of fuels from poor quality heavy fuel to high quality hydrocarbon gases.

The Vasa GD is a multifuel engine well suited for a number of different installations: land-based and offshore power plants, pumping and compressor stations and fuel-off-the-well operation in the oil industry, to mention just a few. Thanks to flexibility in fuel selection, the Vasa GD engine permits minimizing of operating costs. The gas-diesel concept permits instant switchover to the most economical fuel available. The risk of disruption in fuel supply can also be minimized since back-up fuel is always available.

As the Vasa GD has the same output range and basic design as the Wartsila Vasa 22 and 32 diesel engines, existing installations with these models can also be easily rebuilt for multifuel operation. Rebuilding does not alter the maximum engine output.

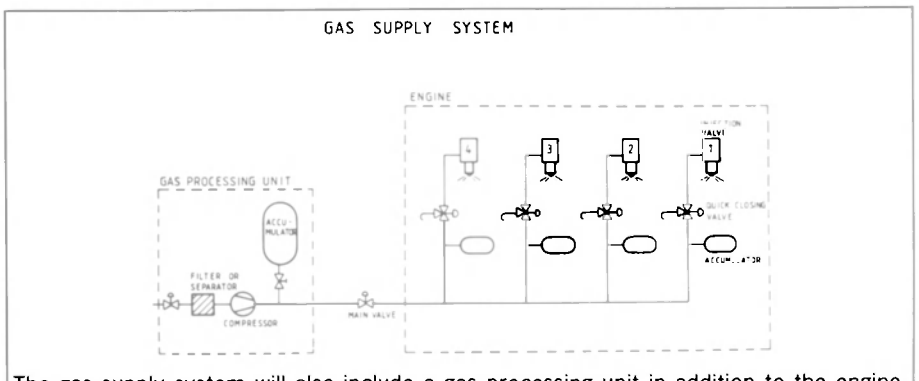
The Vasa GD engine can shift from a gaseous to a liquid fuel and back without interruption. Thermal efficiency is not affected by fuel type, and use of the optimal diesel process in combustion keeps it above 45 percent. Full advantage can thereby be taken of a diesel engine operating as a gas engine, because the output needs not be derated. A conventional gas auto engine does not exploit the full potential of a modern diesel engine because of combustion related factors such as detonation and high thermal load, which also reduce engine efficiency drastically. Wartsila Diesel has therefore chosen to develop the Vasa GD gas diesel engine, which eliminates these obstacles with high-pressure gas injection.



Cross section showing gas engine specific equipment added to a standard Vasa 32 diesel engine.

High-Pressure Gas Injection

The gas fuel, a methane-based hydrocarbon, is compressed to 250 bar before it is fed to the engine. This high pressure results in a high energy density, which means that the gas can be injected into the combustion space at the end of the compression stroke in the same way as in a diesel engine operating on fuel oil. Full benefit is therefore obtained from a modern diesel engine with the same high output and efficiency, using either gas or diesel fuel. Due to the higher autoignition temperature needed for gaseous hydrocarbons than for diesel oil, the temperature in the combustion space must be raised before the gas is injected. The temperature is increased by injecting and burning a small amount of pilot fuel a few crank angle degrees in advance of the gas injection. The pilot fuel can be diesel oil, heavy fuel or crude oil, depending on what is best suited to each particular case.



The gas supply system will also include a gas processing unit in addition to the engine-mounted equipment.

Patented Fuel Injection System

The compressed gaseous fuel is transported from the gas compressor, which is normally located outside the engine room, to the injection valve on the engine via a double walled pipe system. The annular space is mechanically vented to a safe place outside the engine room, where the air is checked constantly by hydrocarbon detectors. The key element in the design concept is the combined injection valve, through which both the pilot fuel and the gaseous fuel is injected. The same valve can be used for operation on gaseous fuel with pilot injection or for diesel fuel alone up to full output in both modes. A special valve design makes it possible to run the engine continuously on heavy fuel without causing any risk of damage to the gas admission side.

Computer Based Control/ Safety System

The safety system is also an essential part of the design concept. Gas engines are fitted with both the normal safety system mounted on conventional diesel engines and additional safety devices. The safety system must also meet the requirements of classification societies for marine installations and local regulations for land-based power plants. The main features of the concept are: a double-walled pipe system eliminates gas leakage to the engine room; an automatic main gas valve in front of each engine and a quick closing valve mounted at each cylinder shut off the gas supply in the event of excessive gas flow to any cylinder, disturbance in the load balance of the engine, gas leakage to the annular space, low output from the engine, or low gas supply pressure.

An electronic governor is used for maximum flexibility. The optimal operating mode, diesel or gas, can be chosen by pushing a button. The changeover from gas-to-diesel mode is automatic in the event of a disruptance in the gas distribution system.

Test Results

Wartsila Diesel has made extensive development tests on a Vasa 4R22 medium-speed diesel engine using high pressure gas injection. The engine has operated at 1,000 rpm and a load range of 20 to 110 percent. The rated output is 162 kW per cylinder, which corresponds to a BMEP of 21.2 bar. The initial tests started with a pilot fuel amount of 10 percent. A very stabile combustion process resulted in further reduction of pilot fuel to 5 percent without any loss in efficiency. No tendency towards detonation was observed during tests with different pilot oil levels. The same high efficiency was recorded during both gas operation and diesel oil operation at all loads.

For free literature giving complete details on the Wartsila Vasa GD,

Circle 76 on Reader Service Card

Hyundai And Conastil Establish Ship Repair Joint Venture In Colombia

Hyundai Corporation signed a basic contract recently to establish a ship repair joint venture with Conastil, the state-owned shipbuilding company of Colombia.

The project is based on the immense potentiality of ship repair in Colombia since the country is situated on the adjacent coast of both the Pacific and the Atlantic Ocean. The new venture involves ship repairing business up to 100,000 dwt vessels, especially focusing on oil tankers and bulk carriers operating in the Atlantic Ocean and the Caribbean Sea.

The joint venture requires an estimated total asset of US$70 million, and Hyundai Corporation, Conastil and International Finance Corp. (IFC) are to jointly participate in the scheme. For this project, Hyundai Corporation will manufacture and supply main equipment, transfer technology and undertake management.

Mackay Announces New High-Frequency Marine Radio Console

The Marine Division of Mackay Communications, Inc. recently announced a new generation high frequency marine radio console.

Designated MRU-35M, the newly designed product is a 1,000-watt, solid-state unit that incorporates the state-of-the-art communications technology demanded in today's single side-band, CW and teletype environments. It is suited for shipboard or fixed station application and is FCC Type Accepted.

Four versions of the MRU-35M are available: Standard Simplex, Simplex ARQ, Full Duplex and Duplex ARQ.

The unit's all-channel, solid-state, microprocessor-controlled transceiver, type 8050M, has 100 channel storage programmable from the front panel and channel scan capability in the receive mode.

Among the MRU-35M's standard features are a modular solid-state, linear amplifier (1020M) providing 1000 watts RF power to the automatic antenna coupler (4030), and automatic power reduction to 125 watts for all frequencies below 4MHz.

Optional equipment includes isolation transformer, noise suppression line filter, 5050 Full Duplex Receiver, 35-foot whip antenna and radioteletype accessories.

The Mackay Marine Division supplies, installs and services a wide array of communications equipment, including radio and satellite communications sytems, navigation system including radars, ARPAS', Loran C, GPS and Automatic Direction Finders, and Pollution Monitoring systems and Flow Meters.

For detailed information and brochures on the MRU-35M and other Mackay Marine products,

Circle 24 on Reader Service Card

National Waterways Conference Elects Officers And Committee Members

Sheldon L. Morgan of Mobile, Ala., senior vice president of First Alabama Bank, was elected as chairman of the National Waterways Conference's board of directors at the organization's annual meeting this year in Little Rock, Ark.

He succeeds **Rodman Kober** of Chicago, vice president-transportation of Continental Grain Co., who had held the chairman's post for the last two years. Moving up as vice chairman was **Berdon Lawrence** of Houston, president of Hollywood Marine, Inc.

Harry N. Cook of Washington, D.C., was reelected as Conference president, a position which he has held since 1978. **J. D. Laman** of Houston, manager of marine transportation for Dow Chemical USA, was named as first vice president.

All other Conference officers were reelected. In addition, four new members won seats on the executive committee, and 12 new directors were elected to the 75-member board of directors. Sixteen others were reelected to new three-year terms.

More than 400 business, civic and waterway leaders attended the National Waterways Conference's recent convention and heard some 30 speakers assess opportunities for growth and expansion in America's river valleys. Deputy Labor Secretary **Dennis E. Whitfield,** Acting Assistant Army Secretary **John S. Doyle Jr.,** and Dr. **Jesse L. White Jr.,** of the Southern Growth Policies Board addressed luncheon sessions.

Mr. **Morgan,** the Conference's newly elected chairman, worked for the Alabama State Docks and the Mobile Area Chamber of Commerce before becoming a bank official in 1972. He has been president and is currently chairman of the Warrior-Tombigbee Development Association.

Reelected as vice presidents of the Conference were **Vernon E. Behrhorst** of Lafayette, La., secretary of the Louisiana Intracoastal Seaway Association; **Wallace A. Gieringer** of Pine Bluff, Ark., executive director of the Pine Bluff-Jefferson County Port Authority, and **Charles F. Lehman** of Jeffersonville, Ind., vice president of American Commercial Barge Line Co. **William J. Hull** of Sea Island, Ga., was reelected as vice president and counsel.

H. Nelson Spencer III, of St. Louis, publisher of *The Waterways Journal,* was named to another term as Conference secretary, and **Howard D. Margraff,** also of St. Louis, was reelected as treasurer.

New members of the executive committee are **Brian L. Garrity** of Mundelein, Ill., supervisor of water distribution systems, IMC Fertilizer, Inc.; **Gary L. Mills** of Minneapolis, assistant vice president of Cargill's commodity marketing division; **L. E. Thompson** of Pine Bluff, Ark., president, Pine Bluff Warehouse Co., and **James E. Walden** of Little Rock, chairman, Helena Marine Service, Inc.

Named to new one-year terms on the executive committee were:

R. A. (Bobby) Guthans of Mobile, president, Tenn-Tom Towing, Inc.; **Worth Hager** of Washington, D.C., Washington representative, National Assn. of Dredging Contractors; **Dennis L. Kirwin** of Houston, vice president and general manager, Midland Marine Corp.; **J. Stephen Lucas** of Stamford, Conn., director, logistics/operations, Louis Dreyfus Corp.; and **Jack M. Park** of Washington, D.C., vice president-government relations, Crowley Maritime Corp.

Tim Parker Jr., of Tuscaloosa, president, Parker Towing co.; **James H. Phillips** of Little Rock, executive director, Arkansas Waterways Commission; **Robert W. Portiss** of Catoosa, Okla., port director, Tulsa Port of Catoosa; **George J. Ryan** of Cleveland, president, Lake Carriers' Assn.; **Stanley L. Vale** of Harrisburg, Pa., intermodal coordinator, Pennsylvania Department of Transportation, and **Donald G. Waldon** of Columbus, Miss., administrator, Tennessee-Tombigbee Waterway Development Authority.

Robert H. Hertzberg of St. Paul, executive vice president, Upper Mississippi Waterway Association, was elected to the board of directors in the association category, and two others—**Morgan D. DuBrow** of Washington, D.C., senior staff engineer, National Rural Electric Cooperative Association, and **T. Mark Simmons Jr.,** of Clarksdale, Miss., chairman of the Lower Mississippi Valley Flood Control Association's executive committee—were named to fill vacancies in the same category.

Reelected to new three-year terms were **Ernest J. Corrado** of Washington, D.C., president, American Institute of Merchant Shipping; **Eunice Platt** of Camden, Ark., executive director, Ouachita River Valley Association; Mr **Cook** and Mr. **Ryan.**

In the carrier category, new members are **P. Gene Flood** of Tampa, president, Gulfcoast Transit Co., and **Craig E. Philip** of Nashville, vice president-marketing, Ingram Barge Co. Three others were reelected: **Nicholas J. Barchie Jr.,** of Chickasaw, Ala., president, Warrior & Gulf Navigation Co.; **John F. Hynes** of St. Louis, executive vice president, SCNO Barge Lines, Inc., and **John F. McKenzie** of Davenport, Ia., president, Alter Barge Line, Inc.

J. Ron Brinson of New Orleans, executive port director and general manager, Port of New Orleans, and **Donald C. McCrory** of Memphis, director, Memphis & Shelby County Port Commission, were elected to the board in the public category. Reelected were **Gary P. LaGrange** of Franklin, La., executive director, West St. Mary Parish Port, Harbor and Terminal District; **William S. (Sam) Masters** of Jefferson City, Mo., director of waterways, Missouri Highway and Transportation Department, and Mr. **Morgan.**

In the shipper category, **Gale R. Rhodes** of Lakin, W. Va., manager, river transportation division, AEP Fuel Supply, was elected to a three-year term, and **Arthur J. Brosius** of Philbro Engergy, Inc., Pittsburgh, was named to fill a vacancy.

Reelected to new terms were **Russell J. Eichman** of St. Paul, vice president-corporate transportation, Harvest States Cooperatives; **James A. Pierce** of Yazoo City, Miss., director of transportation, Mississippi Chemical Corp.; Mr. **Laman** and Mr. **Lucas.**

Three new members were elected to the board's waterway services category: **Warren H. Boren** of New Orleans, executive vice president, Hall-Buck Marine Services Co.; **Thomas D. Murphree Jr.,** of Memphis, general manager, Rivergate Terminal Co., and **Douglas E. Scholin** of St. Louis, vice president and general manager-marine department, Frank B. Hall & Co. of Missouri, Inc.

Reelected were **T.G. McDonald** of Tulsa, chairman, Tuloma Stevedoring Co., and Mr. **Kirwin.**

The National Waterways Conference's 1987 annual meeting was held at the Excelsior Hotel in Little Rock. In 1988, the organization will meet on September 21-23 at the Opryland Hotel in Nashville.

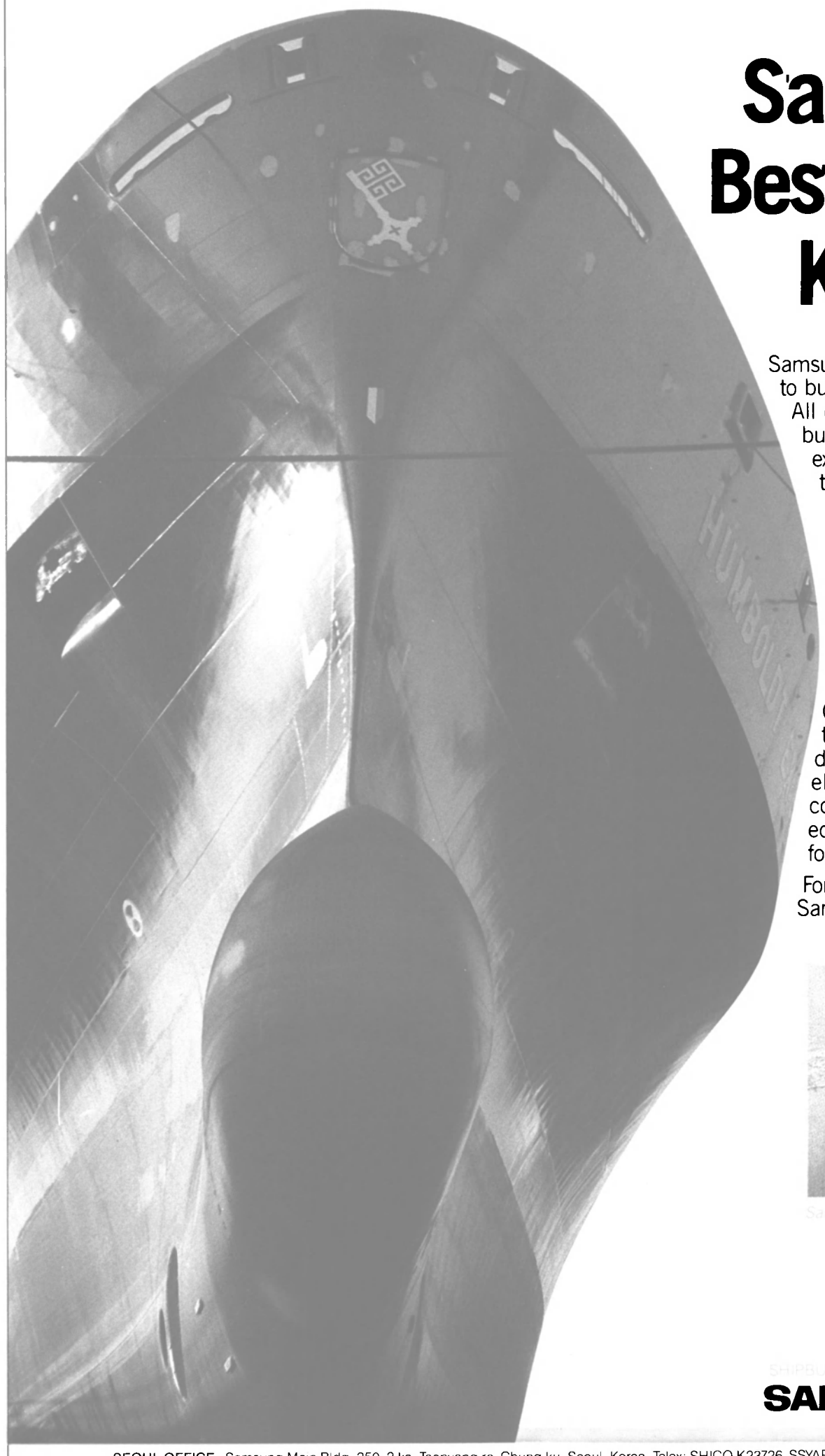
The 400-member Conference, founded in 1960, works to promote a better understanding of the public value of the American waterways system.

Coastal Corporation Subsidiary Opens Office In Rotterdam, Netherlands

The Coastal Corporation of Houston, Texas, announced that a subsidiary has opened an office in Rotterdam, Netherlands, to market fuel oil and related products in northwestern Europe.

The Coastal subsidiary, Coastal (Rotterdam) B.V., is staffed by **Rene Duyn**, managing director; **Oscar Slingerland**, trader; and **Bert van der Zweth**, operations.

Offices of Coastal (Rotterdam) B.V., are located at Hofplein 33, (3rd floor) 3011 A J Rotterdam. Telephone is 31-10-4140188; telex 23704 COSR NL; Fax 31-10-4119473.



Samsung, the Best Organized Korean Yard

Samsung's Koje Shipyard is best organized to build any type of vessel efficiently. All customers who have their vessels built at our yard recognize Samsung's excellent management and superior technology that are unmatched.

Combining the best of East and West shipbuilding technologies, Samsung has built a wide range of highly sophisticated vessels for leading world shipowners.

The large asymmetric stern container ship for Hapag Lloyd represents our advanced level of building technology.

Our corporate philosophy is structured to satisfy our clients in terms of on-time delivery, cost and quality seldom found elsewhere. Samsung is geared to construct high value ships that are economical in operation and profitable for owners.

For your new building projects, contact Samsung today.

Samsung's Koje Shipyard

SHIPBUILDING & OFFSHORE DIVISION

SAMSUNG SHIPBUILDING & HEAVY INDUSTRIES CO., LTD.

SEOUL OFFICE Samsung Main Bldg. 250, 2-ka, Taepyong-ro, Chung-ku, Seoul, Korea Telex: SHICO K23726, SSYARD K23306, Tel. (2) 753-6866, (2) 751-3677/80, 3778/79, 3794, 3799, Fax: (2) 756-9358

KOJE SHIPYARD 530, Jangpyung-ri, Sinhyun-up, Koje-kun, Kyongsang Nam-do, Korea P.O. Box Gohyun 9, Kyongnam, Korea Tel: Gohyun (558) 2-2151/9, Seoul (2) 745-0092/4. Telex: SSCYARD K52211, 52212, 52213, Fax: (558) 32-0877

OVERSEAS BRANCHES •LONDON Tlx: 264606 STARS LG •DUSSELDORF Tlx: 8586392 SAMD D •NEW YORK Tlx: 219176 SAM UR •LOS ANGELES Tlx: 4720575 LASTAR LSA •TOKYO Tlx: 2228463 SHITKY J • AL-KHOBAR Tlx: 670708 SHKBR SJ •SYDNEY Tlx: AA71747 SAMSYD

ELECTRONICS UPDATE

The 164-foot-long, MTU-powered reefer catamaran is one of the largest ever built. Reefer and ferry owners have shown great interest in the new concept.

Westamarin Delivers MTU-Powered All-Aluminum Reefer Catamaran

Swede Ship's Norwegian yard, Westamarin A/S, Mandal, is delivering an all-aluminum reefer catamaran to shipowner Godstrans A/S, Honefoss.

The 164-foot-long by 46-foot-wide "Thermoliner" will mainly be used for transportation of fresh fish from Scandinavia to ports in the English Channel, with return freight of frozen food, flowers, fresh vegetables, etc.

The main deck of the catamaran is insulated and divided into one refrigerated and one freezer room. Onboard equipment for cargo handling comprises hydraulic crane, aft ramp and fork lifts. Main machinery consists of two MTU 16 V 396 TB 84 diesel engines, each rated 2,040 kw, driving two propellers of the "Speed Setter" type, Liaane, Norway.

Developed and constructed in cooperation between the shipowner and Westamarin A/S, this new concept opens up an alternative to truck and air-freight for coastal and feeder traffic to continental ports. Advantages are low crew cost, large, easily accessible cargo space, high speed, limited draft, and onboard equipment for loading/unloading.

The shipowner has an option for another vessel to be delivered late in 1988.

For more information and free literature on Swede Ship's Norwegian yard, Westamarin A/S,

Circle 10 on Reader Service Card

Offshore Marine Service Association Elects New Board Members

The Offshore Marine Service Association (OMSA) reelected five members to its board of directors and elected two new members to the board at the group's recent quarterly meeting in New Orleans, La.

Reelected board members for two-years terms are: **Gilbert Cheramie,** Gilbert Cheramie Boats, Inc. Golden Meadow, La.; **Charles Burrell,** Leevac Marine Transportation, Morgan City, La.; **Jody Powers,** Otis Engineering Corp., New Orleans; and **Ken Waldorf,** Zapata Gulf Marine Corp., Houston.

The two new board members are **Brandt Dufrene,** Oceanic Fleet, Inc. Boutte, La. and **Mark Kury,** McDonough Marine Service, Inc. New Orleans.

OMSA officer activity includes the renomination of **Ken Waldorf** as chairman, the election of **Richard Currence,** Tidewater, Inc. New Orleans as vice-chairman, and the reelection of **Charles Burrell** as secretary-treasurer.

The announcement was made by Capt. **William Mayberry,** OMSA's executive director, who said that the national trade association recently moved its headquarters to suite 1709, 1440 Canal St., New Orleans, La. OMSA promotes the goals and interests of companies providing support to all phases of the offshore oil, mineral, construction, and pipelaying industries.

Soper Elected Chairman And President Of ABS

Richard T. Soper

Richard T. Soper, who became president and chief operating officer of the American Bureau of Shipping on November 1, 1986, was recently elected chairman of the ship classification society and the ABS Group of Companies, with the retirement of **William N. Johnston.**

Before coming to ABS in 1986, Mr. **Soper** held the position of executive vice president of Sea-Land Service, Inc., where he was in charge of the worldwide operations of Sea-Land's fleet of ships. He was elected a member of ABS in 1977. In 1984 he was elected to the ABS board of managers, and in 1985 to the ABS management committee.

Raytheon Introduces JUE-45A, Most Compact And Sophisticated SatCom Of The JUE Series

Available in the USA, Mexico and Europe exclusively from Raytheon Marine Company, this new satellite communications terminal is made by Japan Radio Company, the world's largest manufacturer of such systems. The JUE-45A is designed for merchant ships, commercial fishing vessels, and oceangoing yachts.

The JUE-45A culminates a successful weight-loss program, designed to make SatCom systems even easier to install and operate. Compared to JRC's previous SatCom generation, the JUE-45A's Below Deck Equipment (BDE) is half the size and less than half the weight. And the Above Deck Equipment (ADE) has lost about 15 percent in height and, at 242 pounds, about 33 percent in weight.

The JUE-45A is not only the most compact system of the JUE series, but also the most sophisticated.

The system automatically selects the correct satellite—thanks to a new antenna scanner.

The new abbreviated dialing unit stores up to 40 telephone and telex numbers that the operator can dial automatically by pressing a two-digit number.

And when a message comes from shore, the JUE-45A automatically selects the correct computer modem, facsimile, or telephone—no one has to get up in the middle of the night to receive the message.

The system's Video Display Unit (VDU) features a 14-inch CRT with large, easy-to-read characters, 32 Kbyte memory, and full word-processing capabilities.

JUE-45A SatCom telephone set, video display unit, RO printer, and main terminal, from Raytheon Marine Company.

In addition to these and other standard features, many advanced options are available. For example, The Fleet Data Management System makes fleet operation easier and safer by connecting the shipowner's office with the ships. And, the Automatic Ship's Position Reporting System provides the shore office with real-time navigation data.

For all its abundance of highly sophisticated capabilities, the JUE series is exceptionally reliable, boasting over 40,000 hours MTBF (Mean Time Between Failures).

Raytheon's worldwide network can service the JUE-45A as well as other products from Raytheon's complete line of navigation and communication equipment.

For more information and free literature on the new JUE-45A Satcom from Raytheon Marine,

Circle 18 on Reader Service Card

Circle Seal Controls Offers Free Literature On Check-Relief Valves

The functions of both a check valve and a relief valve are performed by the P-389 Series Check-Relief Valves from Circle Seal Controls. They provide free flow in one direction, zero leakage in the reverse direction, with an internal thermal relief unit.

The P-389 Series valves prevent back flow or back leakage in a liquid or gas system with their check mechanism. A check valve opens at a low cracking pressure and has a low pressure drop. A poppet spring insures that the valve is closed before start of return flow. The Circle Seal floating O-Ring positions automatically for perfect line-of-contact sealing.

The internal relief mechanism protects the system down stream of the valve from overpressure resulting from thermal or other causes. Being combined internally with the check valve, it eliminates the need for an external relief unit and its incumbent piping. The relief mechanism seals with no leakage, virtually to cracking pressure.

Typical applications for the P-389 Series include air, oil, or fuel supply line to reservoir tank. Or, they can be used on the suction side of hydraulic pump to prevent loss of prime or flooding of reservoir tank; also used as vacuum and pressure relief.

Available made of aluminum or 303 stainless steel, in sizes for tubing ranging from ¼ inch to 1 inch. Operating temperatures range from −65 F. to +275 F.

For more information and free literature from Circle Seal Controls,

Circle 29 on Reader Service Card

Fred Schuyler Sells Fendering Company

Greg Armfield and **Dennis Kerber** recently announced that they have purchased the assets of Schuyler's Bumpers, Inc. from **Fred Schuyler,** a pioneer in the marine fendering industry.

The new company, Schuyler Manufacturing Co., will continue to service the commercial and military marine industry with a complete line of engineered and standardized fendering systems. Operations will continue at both manufacturing plants, located in Woodinville, Wash., and Staten Island, N.Y.

Mr. **Schuyler** operated the business he founded over 30 years ago. He designed and built much of the specialized manufacturing equipment required to produce heavy-duty fendering from remanufactured tires. Many fenders used today were also designed by him. He will continue as a consultant for the new company.

Schuyler Manufacturing Co. also offers weld-on fenders for fishing trawlers, trawl net discs, industrial loading dock bumpers, wheel chocks, blasting and loading mats, and street pads for back-hoes and crawler tractors.

For more information and free catalogues, call toll free (1-800) 426-3917, or

Circle 86 on Reader Service Card

RDD, Inc. Appointed Exclusive Distributor For SPT Ltd. Products

Rheiner Dinges

SPT Ltd. of Tollesbury, England, manufacturer of intercommunications systems for marine and industrial use, recently announced the appointment of RDD, Inc. of Houston, Texas, to the exclusive distributorship of SPT products for the United States, Canada, Mexico, Central and South America, and the Caribbean Basin.

Rheiner Dinges, president of RDD, Inc., was previously employed as vice president-technical sales/marketing for SPT Audio, Inc., a former USA-based branch of SPT. Mr. **Dinges** brings to RDD, Inc. 15 years of marine electronic sales and service experience. Prior to working for SPT, Mr. **Dinges** was employed by Electro-Nav as vice president-technical sales and service, Texas Gulf Coast.

For more information and free literature,

Circle 85 on Reader Service Card

Circle 333 on Reader Service Card →

Exxon Introduces Cost-Saving Marine Lubricant Line

Exxon Company, International (ECI) recently announced at a gathering of shipping industry representatives that they have developed a new, high quality marine lubricant line called Exxmar to replace their existing diesel lubricants line, Tromar.

The new line, designed to exceed current and expected future requirements for engine lubricants, is the result of three years of extensive laboratory research and on-board testing.

According to ECI, the Exxmar products, in side-by-side tests with Tromar lubricants, were consistently proved superior in the areas of wear control, alkalinity retention, and cleanliness. In addition, the new line is being made available without any accompanying increase in cost to the shipowner.

ECI test results showed that Exxmar products reduced liner wear and enhanced engine cleanliness as much as 30 percent compared with Tromar. The company said that these benefits, when combined with the Exxcare used oil analysis program and the services of Exxon's marine technical staff, will provide vessel owners and operators many opportunities to improve their operations and reduce costs.

For free literature on Exxmar products from Exxon,

Circle 78 on Reader Service Card

FOR MORE INFORMATION
ON
EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

CIRCLE THE APPROPRIATE NUMBER ON READER SERVICE CARD OPPOSITE PAGE 66

ADVERTISER	EQUIPMENT /SERVICE	CIRCLE NO.
AT&T	COMMUNICATIONS EQUIPMENT/SERVICES	175
ADVANCED VIDEOTECH	COMMUNICATIONS EQUIPMENT	215
AEROQUIP	RISIC COUPLINGS	101
	QDM DETECTION SYSTEM	102
	T-J CYLINDERS	103
	TEFLON HOSE	104
	QUICK DISCONNECT COUPLINGS	105
ALDEN WEATHER	CHART RECORDERS	181
AMERICAN MASON SAFETY TREAD	TREADS/GANGWAYS/LADDERS	133
ASTILLEROS ESPANOLES	SHIPBUILDING	330
AVONDALE	SHIPBUILDING/REPAIR	180
BOLLINGER	SHIPBUILDING/REPAIR	135
CATERPILLAR	PERFORMANCE ANALYSIS REPORTS (PAR)	150
CINCINNATI GEAR	GEARS	260
CLAREMONT COMPANY	THERMAL/ACOUSTICAL INSULATION PRODUCTS	173
COMSAT MARITIME SERVICES	COMMUNICATION EQUIPMENT	310
CRANDALL DRYDOCK	DRYDOCK CONSULTING/DESIGN	224
CUMMINS DIESEL	ENGINES/GENSETS	317
DANYARDS	SHIPBUILDING/REPAIR	256
DEL GAVIO	HYDRAULICS	155
ELDEC	ELECTRONIC SWITCHES	152
ELECTROCATALYTIC	ELECTROCHEMICAL SYSTEMS	240,250
ENVIROVAC	ORCA SEWAGE SYSTEMS	327
ENVIROVAC	E-VAC SEWAGE SYSTEM	206
EVERPURE	FRESH WATER MAKER	273
FERNSTRUM	GRIDCOOLERS	165
GAYLORD INDUSTRIES	GALLEY EXHAUST HOODS	125
GENSTAR STONE PRODUCTS	BALLAST	214
GIBBS & COX	NAVAL ARCHITECTS	191
HBC, INC.	BARGEBUILDING/REPAIR	218
HITACHI ZOSEN	SHIPBUILDING/REPAIR	176
HOSE McCANN	SHIPBOARD COMMUNICATIONS SYSTEMS	142
HYUNDAI	SHIPBUILDING	195
INTERNATIONAL MARITIME ASSOC.	MARKETING INFORMATION SERVICES	188
KAMEWA	PROPELLERS	232
KEARFOTT DIV/SINGER CORP	MARINE WINDOWS, WIPERS, DOORS	205
KOCH ELLIS	TANK BARGE CLEANING	270
LOEFFLER	VALVES	286
MACKAY COMMUNICATIONS	COMMUNICATION SERVICES	202
MAN B&W DIESEL	DIESEL ENGINES	280
MAN GHH	DRY DOCKS	114
McCAUSEY LUMBER	MARINE LUMBER	253
McELROY	DECK MACHINERY	230
L. Q. MOFFITT	ROMOR STAVES	315
J. D. NEUHAUS	CRANES/HOISTS	236
NEWPORT NEWS	SHIPBUILDING/REPAIR	185
NON-FERROUS BOLT	FASTENERS	268
RED FOX INDUSTRIES	SANITATION DEVICES	139
SAMSUNG	SHIPBUILDING/REPAIR	164
SANDUSKY	CENTRIFIGAL CASTINGS	192
SCHUYLER MANUFACTURING	FENDERS	275
SEAWARD INTERNATIONAL	FENDERS	227
SERCK GmbH	HEAT EXCHANGERS	300
STANDARD RADIO & TELEFON	NAVTEX RECEIVER	147
SULZER BROS	DIESEL ENGINES	333
SULZER BROS/ESCHER WYSS	CP PROPELLERS	183
TELEFLEX	REMOTE ACTUATION SYSTEMS	177
TEXACO	BUNKERING SERVICES	276
TROY	FASTENERS	309
U.S. BORAX	FUEL FUNGICIDE	312
UNION PACIFIC RESOURCES	COPPER BLAST ABRASIVE	127
VSE	MARINE DESIGN SERVICES	281
WARREN PUMPS	PUMPS	350
WARTSILA DIESEL	DIESEL ENGINES	220
WARTSILA MARIN	SHIPBUILDING	345
WILLIAM E. WILLIAMS	VALVES	349
ZIDELL	BARGES	305

The listings above are an editorial service provided for the convenience of our readers.

St. Philip Towing Adds Two New Trac-Type Tugs

St. Philip Towing of Tampa, Fla., recently announced that the company has closed with the U.S. Maritime Administration on the purchase of two "trac"-type tugs that had been under construction in Texas.

Bay Transportation, owned by **George M. Steinbrenner,** purchased the assets of St. Philip Towing at year-end 1986 and continues to operate the 23-tug fleet under the St. Philip name.

The two 93-foot-long 4,200-hp vessels acquired by St. Philip features a unique propulsion system placement resulting in the trac-type designation.

Instead of conventional positioning of the propulsion system at the stern of the vessel, the twin screws are mounted in an assembly suspended below the vessel's hull about 30 feet from the bow. The propulsion assembly can rotate in a full circle, enabling the thrust supplied by the twin diesel engines to be applied in any direction.

The trac-type design, which has become common in European ports in the last decade, provides tugs with greater maneuverability in positioning huge ocean vessels at harborside berths and in narrow port channels.

The two 194-gross-ton tugs will be powered by twin B&W Holeby diesels. Propulsion will be Niigata Z-peller 3-A units with 360-degree thrust; geared 1:2.792 Kaplan four-bladed fixed-pitch propellers mounted in 6-foot 10-inch Kort nozzles. Generators will be Caterpillar 6-360, 135 kw.

Electronics include Harris SSB, Sperry gyrocompass, Texas Instruments Loran C, Raytheon radar, Decca gyroautopilot, Raytheon Fathometers and VHM-FM.

One vessel is 90 percent complete and can be fully operational within 120 days; the other is about 50 percent complete with much of the equipment and fittings remaining to be installed. The American Ship Building Company's Tampa shipyard is expected to complete both tugs.

For more information and free literature on American Ship Building Company,

Circle 41 on Reader Service Card

River Services Adds Ice Forecast Service

River Services, Inc. (RSI) of Olney, Md., recently announced an ice forecast service for many navigable rivers in the northern U.S. RSI plans to utilize an ice prediction model that couples the hydraulics and thermal aspects of rivers. The computerized forecast model will be run on the RSI computer daily and forecast ice formation, ice floes, and ice bridging at selected locations on the Mississippi River. The goal of this service will be to provide seven days of ice forecasting accuracy. In addition to ice predictions, current ice conditions will be available for most locations.

River Services is now providing river, stage, discharge, velocity and navigable depth forecasts on the Mississippi River where problems to navigation may occur. Weather forecasts, hurricane and tropical weather bulletins as well as heavy rainfall forecasts are also provided.

For additional information and free literature on River Services, Inc.,

Circle 54 on Reader Service Card

Phoenix Products Acquires Majority Of Russellstoll Lighting Line

Phoenix Products Company, Inc., a Milwaukee manufacturer of loading dock, mining and marine lights, has acquired most of the Midland Ross Russellstoll Division lighting line from FL Industries, Livingston, N.J.

The purchase, for an undisclosed amount of cash, involves a variety of marine and industrial fixtures. These include marine interior and exterior fluorescent with hazardous and explosion-proof ratings, navigation and exterior quartz lights. The balance of the acquisition is high intensity discharge fixtures with various hazardous location listings for both marine and industrial applications.

A privately held 95-year-old multi-million dollar company, Phoenix has been making marine floodlights since 1974. It introduced a line of searchlights in 1982, interior shock resistant fluorescent fixtures for engine rooms in 1983 and smaller deck lights for commercial fishing vessels in 1984.

For free literature on the full line of marine lights offered by Phoenix Products,

Circle 80 on Reader Service Card

S. Korea, Japan Vie For Shipbuilding Lead

According to a recent report, South Korea might be on the verge of overtaking Japan as the world's leading shipbuilder.

The report by Yonhap, the Korean News Agency, said that according to sources, the South Korean shipbuilding industry had received orders for 88 vessels totaling 2.3 million tons by the end of August of this year.

In comparison, Japanese yards had received orders for 67 vessels of 2.71 million tons during the same period.

Of the orders placed with Korea, 39 vessels totaling 1.73 million tons were for export, while in Japan, export orders for 24 ships weighing 1.75 million tons were received.

Hempel Coatings Announces Changes

Thor Bakke, president and CEO of Hempel Coatings (USA), Inc., has announced changes in the management and national organization.

The U.S. market area has been split into three regional sections: an Eastern Region, where **Joel Benetti,** located at Rutherford, N.J., has been appointed regional manager; a Southern Region, with **Tim LaBorde,** located at New Orleans, L.A., as regional manager; and a Western Region, with **David Leggett** as regional manager, operating out of the new office in the Long Beach, Calif., area.

Robert Cory has been appointed industrial marketing manager with the overall responsibility for the industrial market in the U.S.A.

George Seith, former division manager out of Houston, has been appointed executive assistant and will be the executive advisor in the future expansion program for the Hempel organization in the U.S.A.

All appointed promotions have been internally recruited from the Hempel organization.

For free literature giving details on Hempel Coatings,

Circle 49 on Reader Service Card

ITT Standard Introduces An Efficient, Low-Cost Method Of Heating Liquids

ITT Standard, the complete heat exchanger company, is introducing a new "quick heating" heat exchanger—the B-300S which heats with steam.

Pre-engineered and available from stock, the new B-300S heat exchangers feature a U-tube design allowing the instantaneous heating of a wide variety of liquids. However, the B-300 heat exchangers are most commonly used for heating water.

The B-300S heat exchangers feature steel construction with copper tubes and are available in 2, 4, or 6 pass models with shell diameters to 29 inches and lengths to 156 inches.

As steam condensers, the B-300S is ideal, and is suited to most applications where water or glycol solutions need to be heated. Tubeside materials such as brass and stainless steel are also available, if needed, for heating sensitive process fluids.

Bulletin #104-62 contains rating tables for selecting units for steam to water services. The B-300 heat exchangers from ITT Standard are designed and stamped to ASME code.

ITT Standard, formerly American-Standard Heat Transfer Division and now a part of ITT Fluid Technology corporation, is a worldwide supplier of shell and tube, plate, and air-cooled heat exchangers.

For a free copy of Bulletin #104-62,

Circle 50 on Reader Service Card

TTS Delivers World's Largest Skidding System

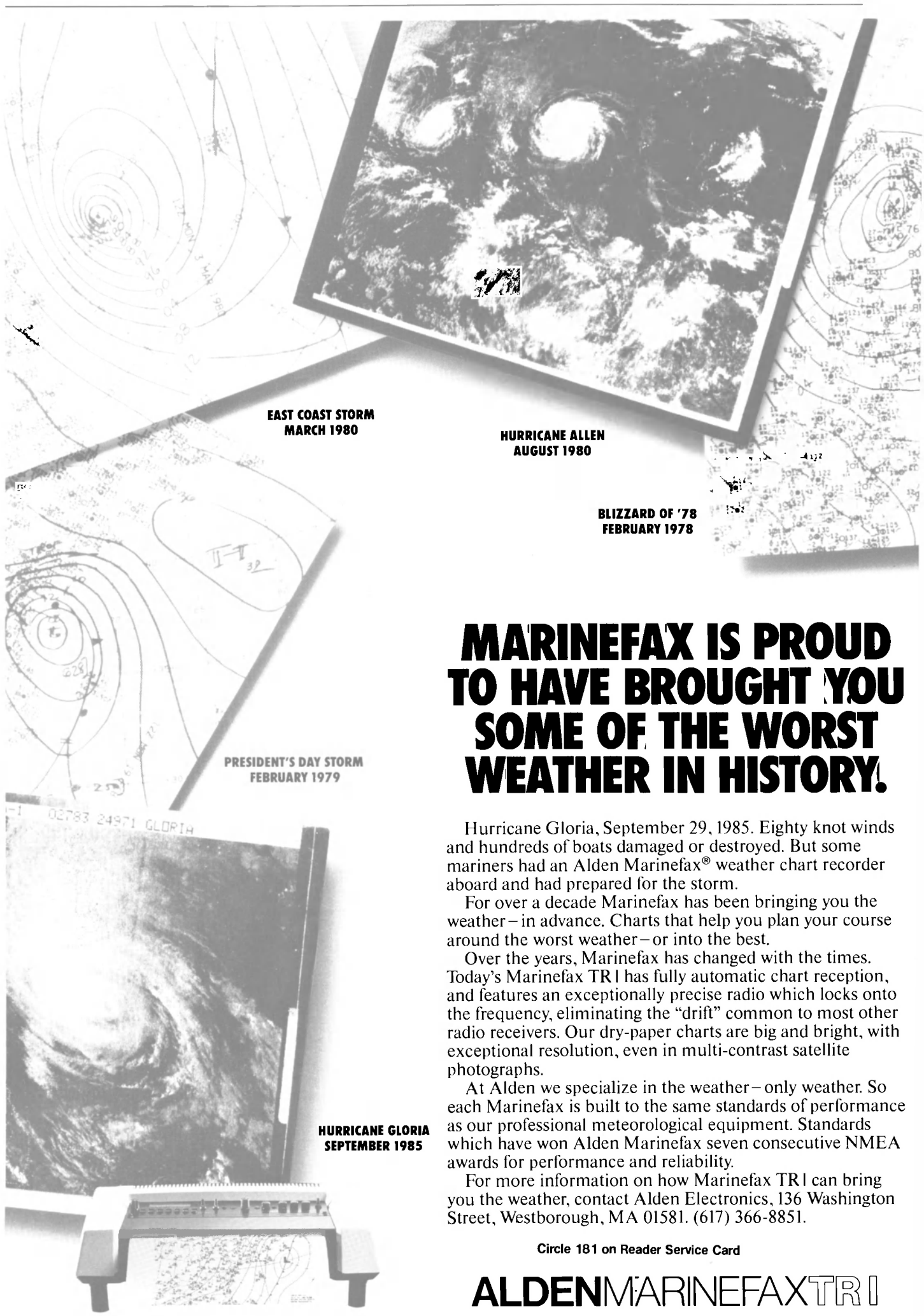
Total Transportation Systems (International) A/S (TTS), through their U.S. subsidiary Kenmark Industries Inc. of Newport News, Va., has completed the world's largest platform jacket launch skidding system.

The 200-ton system, which is able to exert a pushing force of 6,000 metric tons, was custom-designed by TTS for the load-out and launch of a 60,000-ton jacket in the Gulf of Mexico next year. Part of TTS's contract is to install the system aboard a giant 851-foot launch barge being built in Korea specially to accommodate extremely large jackets.

Hydraulic power for the new TTS skidding system is generated by two 750-hp diesel engines driving through an intricate system of computer-controlled pumps and valves to four strongback units which push the platform jacket along a set of skid beams. The entire system is operated by one person via remote control.

For full details on the jacket skidding system and other TTS heavy lift, transportation and automated fabrication systems,

Circle 34 on Reader Service Card



Kim Hotstart Pre-Heating Systems Shrink Engine Idling Costs

Kim Hotstart Manufacturing Co. of Spokane, Wash., is offering free literature on pre-heating systems.

According to the manufacturer, when an engine is equipped with a Kim Hotstart engine pre-heating system, its idling costs are nearly eliminated because electricity is used to keep the engine warm, not gallons of expensive diesel fuel that are required for hours of idling. And since the engine is warm enough to start at a moment's notice and reach full power quickly, getting to a job fast is assured.

Using a Kim Hotstart pre-heating system prevents two cold-starting problems: excessive wear on critical engine parts and emission of white smoke pollutants. Ships and workboats can be kept in service longer as time between overhauls is extended.

Kim Hotstart manufactures three types of heating systems for marine use: lube oil heating systems, coolant heating systems and a combination of the two. Each system has the following approvals: U.S. Coast Guard; CSA-approved for hazardous and wet locations; and approved by major engine manufacturers.

The systems can be operated manually or automatically, and are available with an automatic start-stop control. Each system carries a 12-month warranty and can be easily installed horizontally, vertically or base down.

Additional features include sentry control remote alarm system, flow control detection valve, motor relay lockout, true temperature controls, fused 120-volt control voltage, and pre-wired, palletized components.

For more information and free literature on Kim Hotstart pre-heating systems,

Circle 32 on Reader Service Card

Sembawang Signs Japanese Agreement To Boost Business

Sembawang Shipyard has signed a cooperation agreement with Nippon Kokan K.K. (NKK) of Japan to improve each other's ship repair and conversion business.

The scope of the agreement will allow NKK to share its long-term expertise and technical know-how in the field of shipbuilding, ship repair and conversion with Sembawang Shipyard Limited.

Sembawang Shipyard Limited and NKK will also subcontract ship repair and conversion work received from a third party to each other.

Sembawang can now draw on the technical expertise of NKK in terms of technical consultancy, design, works supervision and the procurement of material and equipment. This upstream service extension will further enhance Sembawang Shipyard's capabilities.

For more information and free literature,

Circle 58 on Reader Service Card

StartMaster Offers Low Pressure SM190 Series Starters

Designed for the rugged conditions of the mining, marine and oil field industries, StartMaster's SM190 Series will crank diesel engines up to 1,800 cubic inches and gasoline engines up to 3,600 cubic inches. Air consumption is a low 5 cubic feet per second, and cranking torque is generated at pressures as low as 40 psi. The lightweight, 38 pound starter features an exclusive positive blade displacement which eliminates freeze ups by mechanically positioning rotor blades into the air stream.

Also available is "SuperStarters," a new, friction-resistant configuration that requires no lubrication to the air motor. It also stops vane sticking due to accumulated lubricants and resists corrosion of the cylinder.

For more information about StartMaster's SM190 Series or SuperStarters,

Circle 47 on Reader Service Card

◀ For literature on the following Aeroquip products circle the appropriate number on the reader service card: RISIC Couplings—**circle 101;** QDM Detection System **circle 102;** T-J Cylinders—**circle 103;** Hose—**circle 104;** couplings—**circle 105.**

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.**

ACCOMMODATION SYSTEMS—MODULAR UNITS
The Waugh Company, 5111-6 Baymeodows Road, Suite 394, Jacksonville FL 32217
AIR COMPRESSORS
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc, 2323 Randolph Avenue, Avenel, NJ 07001
ANODES—Cathodic Protection
Electrocatalytic Inc., 2 Milltown Ct., Union NJ 07083
Kaiser Chemicals, 7311 E. 41st St., Tulsa OK 74147
BALLAST
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
BASKET STRAINERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
BEARINGS—Rubber, Metallic, Non-Metallic
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186
BOILERS
Combustion Engineering, Inc., Windsor, CT 06095
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645
Infrasonik AB (an ASEA Stal Co.). S-612 20 Finspong, SWEDEN
BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
Bergeron & Associates, P.O. Box 726, Chalmette LA 70044
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Jack Faulkner Inc., 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
R.J. Keough Co., 39 Mill Rd., Eastchester, NY 10709
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960
BUMPERS (Crane)
M.E.K. Equipment, P. O. Box 2357, Newport News VA 23602
CARGO ACCESS EQUIPMENT
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E. Chestnut Ave., Santa Ana CA 92701
CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600
Sandusky Foundry & Machine Co., C N 5012, Sandusky OH 44871
CHOCKING COMPOUND
Philadelphia Resins Corp., 20 Commerce St., Montgomeryville, PA 18936
COMPUTERIZED INFORMATION SYSTEMS
TIMSCO, P. O. Box 91360, Mobile AL 36691
COMPUTERS—Training
Logical Operations, 240 East Avenue, Rochester, NY 14604
CONDENSERS/SEPARATORS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Wright Austin Co., 3245 Wight St., Detroit MI 48207
CONTAINER SECURING SYSTEMS
Spanset Marine AB, Box 14112, S-16114 Bromma/Stockholm, SWEDEN
CONTROL SYSTEMS—Monitoring
ASEA, Inc., 4 New King St., White Plains, NY 10604
Bailey Controls, 29801 Euclid Avenue, Wickliffe, OH 44092
Eldec Corporation, 16700 13th Ave. West, P.O. Box 100 Lynnwood, WA 98036
Imo-Delaval, Inc., Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway
S.S. White Industrial Products, 151 Old New Brunswick Rd., Piscataway, NJ 08854
CRANES—HOISTS—DERRICKS—WHIRLEYS
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood NJ 07607 telex: 132610 DELMARINE
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E Chestnut Ave., Santa Ana CA 92701
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
Manitex, Inc., 2203 Timberlock Place, Suite 130, The Woodlands, TX 77380
Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883
DECK MACHINERY—Cargo Handling Equipment
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Gearmatic—see 'Braden Carco Gearmatic' above.
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E Chestnut Ave., Santa Ana CA 92701
DESIGN SERVICES
VSE Corporation, 2550 Huntington Ave., Alexandria VA 22303
DIESEL ACCESSORIES—CYLINDER LINERS
Acurex Corporation, Autodata Division, 555 Clyde Ave., P.O. Box 7042, Mountain View, CA 94039
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
DIESEL ENGINE—Spare Parts & Repair
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
DIVING & SALVAGE
Muldoon Marine Services, P.O. Box 3221, Terminal Island, CA 90731
ELECTRICAL EQUIPMENT
Eldec Corporation, 16700 13th Ave West, P.O. Box 100, Lynwood WA 98036
Lima Electric Co., P.O. Box 918, Lima OH 45802
Ward Leonard Electric, 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201
ELECTRONIC INFORMATION SYSTEMS
Inventory Locator Service Inc., 3820 Premier Ave., Memphis TN 38118
ELECTRONIC SYSTEMS
Hull Electronics Company, 7563 Convot Ct, San Diego CA 92111
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327
Marine Safe Electronics Ltd., 37 Staffen Drive, Concord (Toronto), Ontario CANADA L4K 2X2
ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360
EQUIPMENT—Marine
Atlas Copco Rental, 70 Demarest Dr., Wayne, NJ 07470
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Beaver Tool Co., 1525 SE 29th St., Box 94717, Oklahoma City, OK 73143
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
EVAPORATORS
Atlas-Danmark Desalination Systems A/S, Stamholmen 93, 2650 Hvidovre (Copenhagen), Denmark
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Serck GmbH, Tilsiter Str 90, D-2000 Hamburg 70, WEST GERMANY
FANS—VENTILATORS—BLOWERS
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402
Robinson Industries, P.O. Box 100, Zelienople, PA 16063
FASTENERS
Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455
Non-Ferrous Bolt & Mfg Co., Inc., 3650 W. Russell Rd., Las Vegas NV 89118
Troy Company, 315 Fairfield Rd, Fairfield, NJ 07006
FENDERING SYSTEMS—Dock & Vessel
Intertrade Industries, 15301 Transistor Lane, Huntington Beach, CA 92649
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624
FILTERS
Dahl, J.A. Baldwin Mfg., Co., P.O. Box 610, Kearney, NB 68848
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540
FINANCING—Leasing
JMJ Marine Investors Corp., 1525 River Oaks Rd East, Marahan LA 70123
FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586
FUEL ADDITIVE
Drew Ameroid Marine, One Drew Chemical Plaza, Boonton NJ 07005
U.S. Borax, Industrial Chemicals, 3075 Wilshire Blvd., Los Angeles CA 90010
FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
GALLEY EQUIPMENT
Gaylord Industries, P.O. Box 558, Wilsonville OR 97070
Greitzer, Inc., 101 Riverdale Rd., Riverdale NJ 07457
GANGWAYS, LADDERS
American Mason Safety Tread Company, 153 Essex St., Haverhill MA 01830
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691
HATCH & DECK COVERS—Chain Pipe
American Mason Safety Tread Company, 153 Essex St., Haverhill MA 01830
HEAT EXCHANGERS
Alfa-Laval, Inc., Dept MR-2, 2115 Linwood Ave., Ft. Lee NJ 07024
ITT Standard Heat Transfer Technology, Buffalo, NY 14240
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Serck GmbH, Tilsiter Str 90, D-2000 Hamburg 70, WEST GERMANY
HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241
HYDRAULICS
Aeroquip Corporation, 300 South East Ave., Jackson, MI 49203
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc., 207 W Central Ave., Maywood NJ 07607; telex: 132610 DELMARINE
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
The Claremont Company, 174 State Street, P. O. Box 952, Meriden CT 06450
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Soundcoat, One Burt Drive, Deer Park NY 11729
JOINER—Watertight Doors—Paneling—Ceiling Systems
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Dampa Inc., The Gatehouse at North Park, Suite 106-108, Hunt Valley MD 21030
Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606
KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209
LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
LUBE-OIL CENTRIFUGES
Spinner II Products Div., T.F. Hudgins Inc., P.O. Box 920946, Houston, TX 77292
MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DELMARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038
MINING
Union Pacific Resources, Box 1257, Englewood, CO 80150
NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Combat Systems Engineering & Analysis Corp., 19240 Nordhoff St., Ste 206, P.O. Box 47, Northridge, CA 91324
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
CDI Marine Co., 900 Regency Square Blvd., Suite 203, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
E.Y.E. Marine Consultants, Belmont House, 33 Alderney Dr., Suite 350, Dartmouth, NS CANADA B2Y 2N4
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
JJH Inc., 1101 Kings Hwy, Suite 206, Cherry Hill, NJ 08034
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Korkut Engineers Inc., P. O. Box 7515, Metairie LA 70011
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Clyde Leavitt Inc., 45 Puerto Dr, Ocean Springs, MS 39564
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
R.J. Mellusi & Co., 71 Hudson St, New York, NY 10013
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
National Association of Marine Surveyors (NAMS), 3450 Baychester Ave., Bronx NY 10475
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Omega Marine Engineering Systems Inc., 11757 Katy Freeway, Suite 390, Houston TX 77079
Pyrotech Technical Institute, Delgado Community College, New Orleans, LA
Q.E.D. 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 Inc., 611 Gravier St., New Orleans, LA 70130
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Sea School, 3770 16th Street North, St. Petersburg, FL 33704
Seaworthy Systems Inc., P.O. Box 338, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl., 5203 Leesburg Pike, Falls Church VA 22041.
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
John G. Smith, 5 Shetland Rd., Florham Park, NJ 07932
T.W. Spaetgens, 156 W. 8th Ave., Vancouver BC CANADA V5Y 1N2
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
TIMSCO, P. O. Box 91360, Mobile AL 36691
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744
NAVIGATION & COMMUNICATIONS EQUIPMENT
AT&T, 412 Mt Kemble Ave., Room N420, Morristown NJ 07960
Comsat Maritime Services, 22250 Comsat Dr., Clarksburg MD 20871
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Henschel, 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
Hull Electronics Company, 7563 Convot Ct, San Diego CA 92111
iTT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Radar Devices Inc., 2955 Merced St., San Leandro, CA 94577
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Company, 46 River Rd., Hudson NH 03051
Raytheon Service Company, 5740 East Bayside Rd., Virginia Beach VA 23455
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SPT Audio, 8928 Kirby Dr., Houston TX 77054
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Standard Communications, P.O. Box 92151, Los Angeles CA 90009
Standard Radio & Telefon AB, P.O. Box 501, S-162 15 Vallingby, SWEDEN
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Chevron USA, 575 Market St., San Francisco, CA 94105
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650
OIL/WATER SEPARATORS
Alfa-Laval, Inc., Dept MR-2, 2115 Linwood Ave., Ft. Lee NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ

07647
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
Microphor, Inc., 452 E Hill Rd., P.O. Box 1460, Willits, CA 95490

PAINTS—COATINGS—CORROSION CONTROL
American Mason Safety Tread Company, 153 Essex St., Haverhill MA 01830
Ameron, 4700 Ramona, Monterey Park, CA 91754
Magnus Maritec, division of Drew Chemical, One Drew Plaza, Boonton NJ 07005
Palmer International, P.O. Box 8, Worcester, PA 19490
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings, Supports
Aeroquip, 300 South East Ave., Jackson, MI 49203
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Murdock Engineering, P.O. Box 152278, Irving, TX 75015
Stauff Corporation, 21-23 Industrial Park, Waldwick NJ 07463
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications
Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
SFGP Inc./Industrial Plastics, 2330 16th St. So., P.O. Box 875, Wisconsin Rapids, WI 54494

PORT SERVICES
Port of Iberia, P.O. Box 897, New Iberia LA 70561

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar In., Engine Division, 100 N E Adams, Peoria IL 61629
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Combustion Engineering, Inc., Windsor, CT 06095
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Falk Corporation, subsidiary of Sundstrand Corporation, Milwaukee WI 53201
Fincantieri, Diesel Engines Division—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
General Motors, Electro-Motive Division, LaGrange, IL 60525
Isotta Fraschini Motori SpA (Fincantieri Group), Via Milano n. 7, 21047 Saronno (Va), ITALY
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp MaK, P.O. Box 90 09, D-2300 Kiel 17, WEST GERMANY
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
Marine Gears, Inc., P.O. Box 689, Greenville MS 38707
MAN B&W Diesel, 50 Broadway, New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Hoelby, Denmark
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15. DK-9900 Frederikshavn Denmark
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 Germany
MTU of North America, 10450 Corporate Dr, Houston TX 77478
North American Marine Jet P.O Box 1232 Benton, AR 72015
Northwest Marine Services Corp., 6452 So. 144th St., Tukwila WA 98168
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Sulzer/Escher Wyss, Ravensburg WEST GERMANY
Tenfjord Inc., 200 Jackson Ave., Hoboken, NJ 07030
Ulstein Maritime Ltd., 96 North Bend Street, Coquitlam BC CANADA V3K 6H1
Ulstein Propellers, N-6065 Ulsteinvik, NORWAY
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH, Marine Division, Postfach 1940, 7920 Heidenheim/Brenz, WEST GERMANY Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072

PUMPS—Repairs—Drives
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Imo-Delaval, Inc., IMO Pump Division, Box 447, Monroe NC 28810
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Vita Motivator Co., 84 Wall St., Farmingdale, NY 11735
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231

ROPE—Manila—Nylon—Hawsers—Fibers
American Manufacturing Co., Cordage Div., P.O. Box 52125, Lafayette LA 70505

SANITATION DEVICES—Pollution Control
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Microphor, Inc., 452 E Hill Rd., P.O. Box 1460, Willits CA 95490
Research Products/Blankenship (Incinolet), 2639 Andjon, Dallas, TX 75220

SCAFFOLDING EQUIPMENT—Work Platforms
McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238

SCALE MODELS
Sturgeon Bay Model Shop, 187 N Ninth Ave., Sturgeon Bay WI 54235

SCUTTLES/MANHOLES
L.S. Baier & Assoc., 7527 NE 33rd Dr., Portland OR 97211
Juniper Industries, 72-17 Metropolitan Ave., Middle Village, NY 11379
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHIPBREAKING—Salvage
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT
American Marine, P.O. Box 8126, New Orleans LA 70182
Hilman Inc., 2604 Atlantic Ave., Wall, NJ 07719
M.A.N.—GHH, Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, West Germany
NEI Syncrolift, Inc., 8970 S W 87th Ct., Miami FL 33176

SHIPBUILDING—Repairs, Maintenance, Drydocking
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Bollinger Lockport & Larose, P.O. Box 250, Lockport LA 70374
Brodosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA
Burmeister & Wain Skipsvaerft A/S, P.O. Box 2122, Refshaleoen, DK-1015 Copenhagen, DENMARK
Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Gladding Hearn Shipbuilding, One Riverside Ave., P.O. Box 300-W, Somerset, MA 02726
HBC Barge Co. Brownsville, PA 15417
Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530
Hyundai Corporation, ShipSales Dept., 140-2 Kye dong, Chongro-ku, Soeul, KOREA
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
Marinette Maine Corporation, Marinette, WI 54143
MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
Munson Manufacturing, 150 Dayton, Edmonds WA 98020
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Portland Ship Repair Yard, 5555 N Channel Ave., Portland, OR 97217
Ryan Marine Inc., P.O. Box 400, Port Bienville Industrial Park, Pearlington MS 39572
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
Sudoimport, 10 Usperiski Per, 103006 Moscow USSR
Todd Shipyards Corporation, One Evertrust Plaza, Jersey City, NJ 07302
Versatile Pacific Shipyards, Inc., P. O. Box 86099, North Vancouver BC Canada
Wartsila Marin Industri AB, P.O. Box 1090, SF 00101 Helskini, FINLAND
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

SHIP MANAGEMENT
Texaco Marine Servcies Inc., P. O. Drawer 1028, Port Arthur, TX 77641

SHIPPING—PACKING
Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040

SIMULATOR TRAINING
Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371

SILENCERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

STARTERS-Air
Startmaster, Division of Sycon Corp., 959 Cheney Ave., P. O. Box 491, Marion OH 43302

STUFFING BOXES
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

SURVEYORS AND CONSULTANTS
Advanced Technologies Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102

SURVIVAL EQUIPMENT
Parkway/Imperial, 241 Raritan St., So. Amboy, NJ 08879

TANK CLEANING
Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928

TANK LEVELING INDICATORS
Imo-Delaval, Inc., Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Marine Moisture Control, 60 Inip Dr., Inwood, NY 11696

TORSIONAL VIBRATION SPECIALISTS
T.W. Spaetgens, 156 W. 8th Ave., Vancouver, Canada, V5Y 1N2

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Curtis Bay Towing, World Trade Center, Suite 800, Baltimore MD 21202
Jack Faulkner, 1005 W. Harimaw Ct., Metairie, LA 70001
McAllister Bros., Inc., 17 Battery Pl., New York, NY 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, LA
Moron Towing & Transportation, Two Greenwich Plaza, Greenwich CT 06830

VALVES AND FITTINGS
Aeroquip, 300 South East Ave., Jackson, MI 49203
Bailey, Division of CMB Industries, P.O. Box 8070, Fresno, CA 93747
Cajon Co., 9760 Shepard Rd., Macedonia, OH 44056
Chemiquip Products Co., Inc., 3 W. 18th St., New York, NY 10011
Circle Seal Controls, Brunswick Corporation, P.O. Box 3666, Anaheim, CA 92803
Cla-Val Co., P.O. Box 1325, Newport Beach, CA 92663
Crawford Fitting Company, 29500 Solon Road, Solon, OH 44139
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Elliott Manufacturing Co., Inc. (Remote Valve Operating Equipment), P.O. Box 773, Binghamton, NY 13902
Loeffler Machine, US #1 & Robbins Ave., Penndel PA 19047
Nupro Co., 4800 E. 345th St., Willoughby, OH 44094
Pancoast Marine Division, Front & Porter St., Philadelphia, PA 19148
Parker Hydraulic Valve Division, 520 Ternes Avenue, Elyria, OH 44035
Parker Actuator Division, 9948 Rittman Road, P.O. Box 450, Wadsworth, OH 44281-0450
Parker Systems Division, 651 Robbins Drive, Box 3500, Troy, MI 48007-3500
Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236
Tate Andale Inc., 1941 Landsdowne Rd., Baltimore, MD 21227
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186
Whitey Co., 318 Bishop Road, Highland Heights, OH 44143

VIBRATION ANALYSIS
DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110
Vibranalysis Engineering Corp., 4380 S. Wayside, Suite 100, Houston TX 77087

WASTEWATER TREATMENT
EES Corporation/Omnipure, An Eltech Systems Company, 12850 Bournewood Dr., Sugarland TX 77478

WATER PURIFICATION TREATMENTS
Electrocatalytic Inc., 2 Milltown Ct., Union NJ 07083

WATER PURIFIERS
Alfa-Laval, Inc., Dept MR-2, 2115 Linwood Ave., Ft. Lee NJ 07024
Atlas-Danmark Desalination Systems A/S, Stamholmen 93, 2650 Hvidovre (Copenhagen), Denmark
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

WEATHER CHART RECORDERS
Alden Electronics, 40 Washington St., Westborough, MA 01581

WELDING
Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912

WINCHES AND FAIRLEADS
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434
Gearmatic—see 'Braden Carco Gearmatic' above.

Blount Marine Building Sixth Vessel For Cruise International

Richard D. O'Leary, president of C.I. Travel/Cruise International, Norfolk, Va., recently announced that the seventh ship in the Spirit line, the Spirit of Chicago, is presently under construction at Blount Marine in Warren, R.I. It is the sixth vessel built by Blount Marine for Cruise International.

The 600-passenger Spirit of Chicago is a sister ship to the Spirit of New York, which was launched in May of this year. The 192-foot cruise ship features a complete galley and three enclosed, carpeted, climate-controlled decks for dining and dancing.

The Spirit of Chicago will be the largest harbor cruise vessel operating in Chicago. It will be available for customized charters for groups, corporations, and conventions as well as for individual passenger cruises.

The Spirit of Chicago will employ approximately 275 people and is scheduled to begin service from Navy Pier on Lake Michigan in May 1988.

For free literature giving complete information on Blount Marine,

Circle 84 on Reader Service Card

Deutsch HD10 Series Connectors Offer Outstanding Performance And Environmental Protection

Deutsch, Industrial Products Division, recently announced the introduction of the HD10 Series Connectors for high performance industrial and commercial applications. The HD10 is ideally suited to light or heavy industrial and commercial applications, including trucking, public transportation, construction equipment, robotics, control systems, machinery, automotive, recreational vehicles, commercial aviation, marine, broadcast, video and telecommunications equipment, medical instrumentation, office and business equipment, plus numerous other electrical and electronic applications.

The HD10 features a lightweight, high-impact thermoplastic shell design which provides an environmental barrier to grease, dirt, dust, moisture, chemical contamination and corrosion. The connector can operate with either AC or DC from 2mV to 1,500 VAC, and maintains a current rating capacity from 13 to 100 amps.

Operating temperature range is from −55° C to +125° C and can withstand up to 50g's without unlocking or unmating. The connector accepts either stranded or solid wire (4 to 18 AWG) with standard crimp terminations. Contact retention is rated at 25 pounds for Size 16, with an insulation resistance of 1,000 megohms at 25° C.

Keyed coupling provides an accurate and positive alignment of contacts and permits simplified mating/unmating of connectors. The HD10 is available in kit form, ready to use and easy to assembly, making it ideal for field maintenance and repair. Contact cavities are sequentially numbered for positive identification and connector assembly. Presently, this series is available in either panel mount or in-line receptacles that mate with a straight plug, and come with a choice of six insert arrangements.

For free literature, pricing and delivery information,

Circle 66 on Reader Service Card

Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
Nashville Bridge Co., P.O. Box 239 Nashville TN 37202
Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

WINDOWS
Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, NY 10550

WINDOW WIPERS
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928

WIRE AND CABLE
Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

B&W Christens Seventh In Series Of Product Tankers

The M/T Chrisholm has a double skin and double deck that contribute to safety as well as insulating the cargo against thermal loss and overheating from the sun.

Burmeister & Wain recently celebrated the naming of its new building No. 923, the seventh in a series of Panamax product tankers, type CP54E built by the yard during the last two years.

The vessel, named the M/T Chrisholm, was contracted by K/S Christiansholm, a partnership of Danish tax investors. Scheduled to be delivered next month, the tanker will be operated by the Norwegian shipowners Torvald Klaveness & Co. A/S, and is the first of two sister vessels.

The M/T Chrisholm has an overall length of 750 feet, breadth of 106 feet, and a design draft of 38 feet. Propulsion is by one five-cylinder, two-stroke MAN B&W diesel engine of the new L70MCE type, developing 10,900 bhp at 84 mcr and turning a four-bladed propeller with a diameter of about 23½ feet.

The vessel is built to Det norske Veritas class.

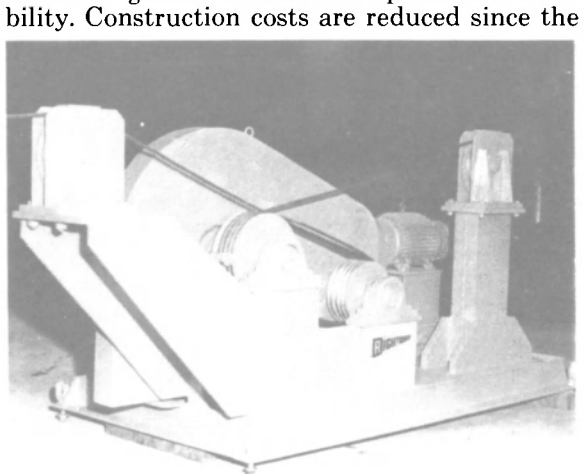
For free literature giving complete details on the facilities and capabilities of Burmeister & Wain,

Circle 87 on Reader Service Card

Stanspec Corporation's Rightway Car Puller Offers New Features

As a special optional feature, frame-mounted sheaves have been integrated into the design of the popular Rightway ERP Long Distance Car Puller from Stanspec Corporation.

These heavy-duty sheaves allow the user to pre-set the level of the main haulage rope which results in greater control and operational flexibility. Construction costs are reduced since the built-in sheaves eliminate the need for separate foundations which are required for remote sheave placement. Less space is required and overall system layout can be improved.



New Rightway ERP Long Distance Car Puller features frame-mounted sheaves for added control and economy.

The ERP model provides constant torque and constant speed features and requires no bulky counterweight system. It can be used for unlimited distances and for pulling in either direction with controlled braking.

Standard capacities range from 500 to 15,000 pounds. Special models are available with capacities up to 50,000 pounds.

For free literature giving complete information on the Rightway ERP Long Distance Car Puller from Stanspec,

Circle 64 on Reader Service Card

Docksta Delivers Volvo-Penta Powered Rescue/Ambulance Boat

The 41-foot-long rescue and ambulance boat Folke was recently delivered to the Gothenburg Fire Brigade by the North Sweden yard Dockstavarvet. The vessel is equipped for all types of rescue work, with emphasis on ambulance duties.

The design of the Volvo-Penta powered workboat Folke was developed by Docksta from a series of pilotboats built by the yard in 1986. The raised location of the wheelhouse permits good visibility aft.

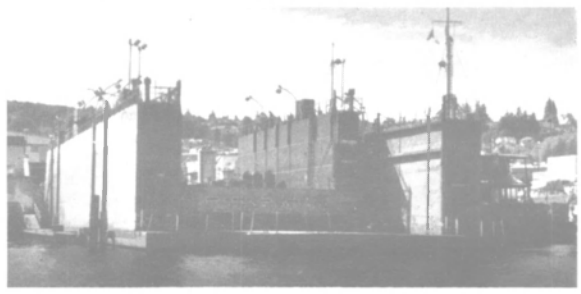
The Folke is powered by two Volvo-Penta TAMD 71 diesels each rated at 292 hp at 2,500 rev/min, driving twin 26 by 26 Radice propellers on 60-mm-diameter stainless steel shafts through Twin Disc MG 509 2:1 U-type reverse-reduction gears. The vessel achieved 22.5 knots on trials.

Navigation equipment includes a Silva 100 magnetic compass, Silva 2200 log, NECO autopilot, Furuno FR803 daylight-viewing radar, and Furuno FE4200 echosounder.

Other machinery in the Folke includes a belt-driven Johnson bilge pump with solenoid coupling, a Kempa manual bilge pump, Webasto heater and Autothermo water/air heat exchangers. Fire warning system and the Halon fire extinguishing system were supplied by Dafo.

For free literature on Dockstavarvet AB,

Circle 68 on Reader Service Card



DRYDOCKED DRYDOCK—A routine maintenance job on its 500-ton capacity drydock created this not-so-routine right at Marco Seattle when the shipyard lifted the smaller dock in its 1,800-ton counterpart to do the work. Both of the steel drydocks were designed and built by Marco.

For free literature giving complete details on Marco Seattle,

Circle 69 on Reader Service Card

MAN GHH Reports On Design Requirements For Modern Naval Drydocks

Part II: The Critical Importance Of Block Support

A feature article detailing the overall advantages of MAN GHH drydock designs specifically for naval ship applications appeared in the October 1987 issue of Maritime Reporter and Engineering News.

This second follow-up article examines more closely the critical areas of design and placement of both keel blocks and bilge blocks in order to provide optimum efficiency in accommodating the sometimes unusual hull configurations of naval vessels. Some Navy ships, such as cruisers and destroyers, have hull appendages that protrude beyond the normal keel line—some by a great distance. Protrusion of appendages such as sonar domes, fin stabilizers, rudders and propellers may be as much as 10 feet.

During the drydocking of a ship the areas of block support are very critical. For docking there is always a planned program that defines the points of support and the support areas required; each time a ship is docked, the positions are varied slightly so that the whole bottom surface of the ship can be progressively inspected and maintained.

To permit precise adjustment of the block heights, the blocking program allows for deviations from the designed hull configuration by including the measured profile.

Keel Blocks

Keel blocks are commonly covered with a timber layer which allows a more even distribution of the load on the hull contact surface.

The normal bearing width of the block is 4 feet, however, some vessels (e.g. with a pipe tunnel) require blocks wide enough to support both longitudinal bulkheads of the tunnel. Additionally for offset tunnels a block head width between 8 and 10 feet is required.

The block heads designed by MAN GHH are constructed from steel overlayed by wood with a tapered structure toward the pontoon deck that allows an attachment also for the normal 4-foot bearing width. All keel blocks are removable to permit access to the vessel's hull. Earlier MAN GHH blocks were fitted with a wedge that could be knocked out for unloading or removing (see Exhibit 1). Modern blocks are supplied with a sandbed design. This method has a bed of sand of approx. 6″ depth beneath the timber layer. During loading the sand settles to give an even distribution of load and for unloading or removal it may be flushed out with water (see Exhibit 2). Normal practice adopted is that once the block is removed, it is not replaced to the same position but set up for use on the next ship to be docked.

A keel block would normally sit on the level pontoon deck. The deck plating of a floating drydock is reinforced below the keel block positions. For a steel-based keel block structure, as in Exhibit 1 and 2, a cross-bracing below the deck is normally sufficient. A keel block base structure of timber or concrete, as in Exhibit 3, will require the below deck bracing to be spaced close enough to prevent over-deflection of the deck plating.

Reduction of high block loads can often be achieved by skillful manipulation of tank loadings. Particularly high loads occur on the end blocks when docking either a short ship in a long dock or a long ship in a short dock. In the first case the dockmaster will attempt to completely unload ballast tanks, this can only be achieved for those tanks that the ship length completely covers. The ship can then only be lifted with the buoyancy produced by the loaded tanks, thus avoiding dock deflection and increase of block loading at the dock ends.

In the second case the following procedure is used: (a) The ship is to be supported by a set number of blocks with equal loading on each block. (b) The bending stresses in the hull of the ship in the supported condition may be calculated and checked for safety. (c) The hogging curve of the hull may also be determined. (d) On docking, this predetermined hogging condition must be achieved, i.e. the actual hogging deflection, with the ship supported, must not be less than the predetermined value.

Note: If the predetermined hogging deflection is greater than that achievable by experience of the dock characteristics, then the height of the blocks towards the dock ends can be reduced and a new hogging deflection derived.

Clearly, the higher the level of ballast water remaining in the dock tanks after lifting, the greater the level of dock pre-hogging can be achieved (i.e. the lighter the ship).

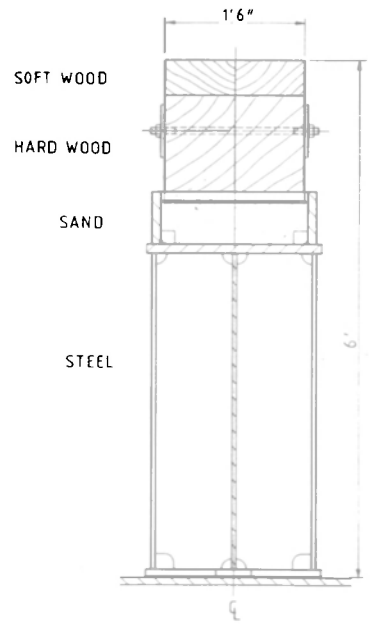


Exhibit 2
KEEL BLOCK

Bilge Blocks

In addition to the keel blocks the ship is supported along both sides by bilge blocks. MAN GHH have adopted the type of construction as shown in Exhibit 4. Basically it consists of a pivoted steel beam, one end of which can be raised or lowered by a mechanical drive system. This type of block allows complete removal with no projections into the dock area.

During the initial docking of a ship, the bilge blocks are set in their lowest position and are recommended only to be used as a means of maintaining the ship upright and stable. When the ship is in its final position fully supported by the keel blocks, then the bilge blocks are raised lightly against the sides of the ship. Then consecutively and progressively as the ship is lifted, each block is lowered and raised to give a light stabilizing load on the hull. When completed in this manner there will be no undue loads on the bilge blocks and minimum stressing of the ship's skin, particularly important in naval applications.

In the special case of naval applications, or where the ship's hull is unsuitable for support by only one line of keel blocks, then the bilge blocks need to be more robust than normal, and a wider block bed is required.

Extended vertical adjustment of the bilge block is effected by either extension of the lifting arm or by additional base structures as in Exhibit 5.

Operation of the lifting arm can be by pneumatic drive or manually operated mechanical drive from the upper deck. Normally the manual drive, which is more sensitive, is used only during the final phase of block application to the hull, but is frequently coupled with a motor drive for all the preparatory work.

The MAN GHH beam-type of bilge block is particularly suited for pre-preparation of block heights because it permits easy and infinitely variable vertical adjustment.

To ensure that the deck is accessible after lifting the ship, all the necessary ancillary equipment can be removed.

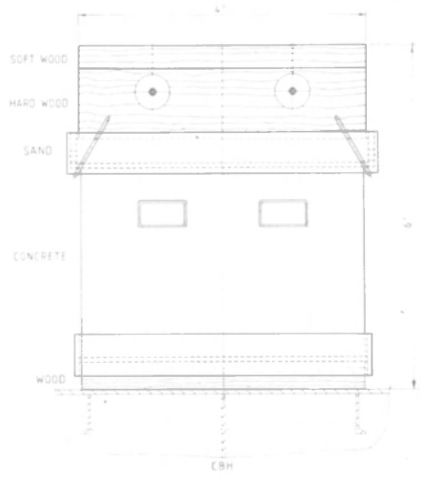


Exhibit 3
KEEL BLOCK

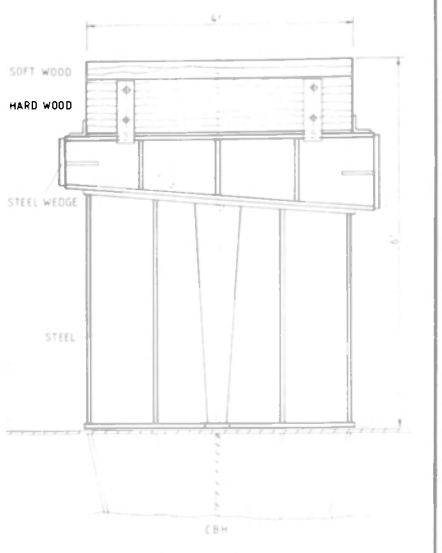


Exhibit 1
KEEL BLOCK

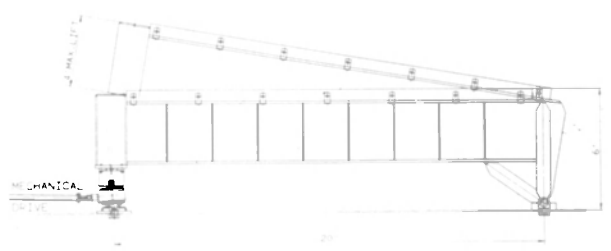


Exhibit 4

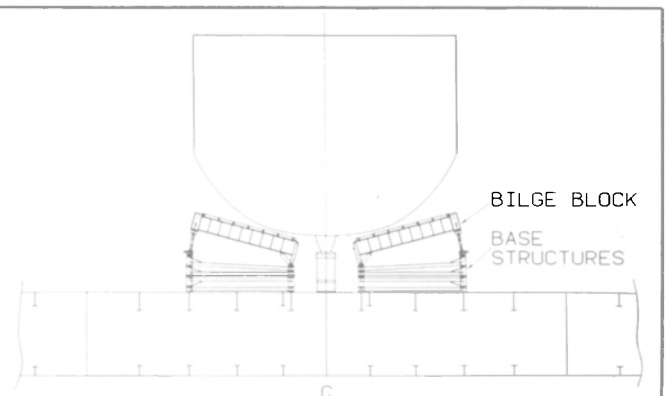


Exhibit 5

Conclusion

Use of a modern drydock specifically designed for naval ship requirements increases work productivity, enhances safety and ensures the necessary protection of the ship while drydocked.

For further information about MAN GHH floating docks, contact: MAN GHH Corporation, 50 Broadway, New York, N.Y. 10004, or telephone: (212) 509-4545.

For free brochures and other literature completely describing MAN GHH drydocks,

Circle 106 on Reader Service Card

Adrian R. P. Day Named Racal Marine President

Racal Corporation recently announced the appointment of **Adrian R. P. Day** as president of Racal Marine, Inc. Racal Marine, a unit of the international Racal group, is a leading manufacturer and supplier of marine navigation systems, radar, positioning equipment and integrated ship systems. Mr. **Day** is responsible for the company's activities in the United States and Canada, including the affiliated operations of Racal Survey, Inc. in Houston and Racal-Decca Canada Inc. in Mississauga, Ontario.

Mr. **Day** joined Racal Electronics in the United Kingdom in 1964 as a test engineer, following six years of service with the Royal Electrical and Mechanical Engineers of the British Army. He was subsequently promoted to quality assurance manager, production manager and production director, supporting several Racal subsidiaries in England. In 1986, prior to his present position, Mr. **Day** was appointed executive vice president of a Racal Marine and Energy group company in the United States.

Bremer Vulkan Delivers Second Of Three Ships

The second of three oil-bulk-ore carrier conversions was delivered recently by Bremer Vulkan AG, West Germany's largest shipyard.

The ships, of 40,000 dwt, will carry bulk cargo including ore and oil, with containers or forest products carried on deck.

The first of the ships was delivered in September, with the third scheduled for delivery this month. All three will be based in Bremen and will fly the West German flag.

ABS Appoints Crawford And Lee Assistant VPs

William S. Crawford, manager of marketing of ABS Worldwide Technical Services, Inc. (ABSTECH), a subsidiary of the American Bureau of Shipping (ABS), and **Faith K. Lee,** general manager of the ABS computers department, have been appointed assistant vice presidents of ABS, the international ship classification society.

Mr. **Crawford** heads a new department in ABS, called corporate marketing services. The department will be the marketing/sales support group for all of the divisions and subsidiaries of ABS.

Mrs. **Lee** becomes head of the new ABS information systems group. Her responsibilities include all data information resources, such as computer systems and their applications, as well as the telecommunications network systems used by ABS.

PBM Offers Free Catalog On 3-Way Diverter Valves

Pittsburgh Brass Manufacturing (PBM) of Irwin, Pa., is offering free literature on three-way diverter ball valves. PBM's recently redesigned three-way diverter valves have been expanded to include 3-inch and 4-inch sizes with flanged end connections.

Other features which have upgraded the line are: integrally cast end connections—no fabrications; investment castings in 316 S/S; both side and bottom ported models are available; and there are six different end connections available.

Optional items include high-temperature seats and seals, teflon body cavity fillers, and sanitary polishes for ultra clean process systems.

Sizes available are ½-inch to 4 inches, in bronze and in 316 S/S pressures to 400 psi and temperatures to 550° F are possible.

PBM catalog section IV-A gives complete engineering data on the line of valves. For a free copy,

Circle 40 on Reader Service Card

Pusnes Marine & Offshore Services Establishes Factory Service And Sales Outlet In New Orleans Area

—Literature Available—

A/S Pusnes Marine and Offshore Services, Arendal, Norway, has recently established a factory service and sales outlet in the New Orleans area.

Pusnes, Norway was originally established in 1875 to build sailing ships. While this side of the business gradually decreased until finally ceasing with shipbuilding in 1960, the production of deck machinery, which was started in 1890, rapidly increased.

The main Pusnes product today is still deck machinery driven either by hydraulic, steam or electric power. Some applications include super tankers, RO/RO vessels, semisubmersible drilling rigs, large anchor-handling tugs and pipe-laying barges.

Interest in the offshore industry and its mooring and anchoring problems was a natural development from Pusnes's basic background experience. Close working contact with shipowners, shipyards, consultants and offshore contractors has enabled the company to develop state-of-the-art products and systems.

Pusnes has provided some of the largest offshore mooring equipment ever produced. One application includes 16 single drum, electric powered winches for a semisubmersible derrick barge built for a European contractor. Each winch is capable of spooling 10,000 feet of 4-inch-diameter wire rope and has pulling capability in excess of one million pounds. The test bed at the factory in Norway has capability in excess of 2 million pounds pull.

On the Gulf Coast, Pusnes will be working in partnership with Green Marine and Industrial Equipment, Metairie, La., for servicing equipment.

Donald G. Storck Jr., president-USA Operations, will head up the new Pusnes office.

Pusnes products and services are exported globally. The company is represented with sales, production and service in all major countries involved in offshore projects and shipbuilding.

Pusnes Marine and Offshore Services offers a complete program of mooring and anchoring systems for ships and offshore units.

Covering the range from five to 300 tons pulling capacity, the standard winch program uses high-pressure hydraulic, AC/DC electric or steam power.

The company has also developed and supplied diving winch systems and complete offshore tanker loading systems for oil production platforms and loading buoys.

Some examples of Pusnes's versatility include:

The shuttle tanker M/T Jarena, awarded the "48th Annual Distinctive Oceangoing Ships Awards" and the "Outstanding Oceangoing Ships of 1983," is equipped with Pusnes high-pressure hydraulic deck machinery and Pusnes single point bow loading and mooring system. The ship, built by Daewoo Shipbuilding & Heavy Machinery Ltd, Korea, for the Norwegian shipowner Anders Jahre of Sandefjord for charter to Statfjord Transport, Norway, is a purpose-built tanker for lifting crude oil from the Statfjord North Sea oilfields.

Pusnes has designed and produced the mooring equipment for the Rig-85. The equipment is capable of year-round operation in hostile areas. The rig, ordered by Polar Frontier Drilling, a joint venture of Wilh. Wilhelmsenand Sonat Offshore Drilling, is an all-weather semisubmersible for drilling above the Article Circle. Rig-85 will operate under a long-term charter with Norsk Hydro.

Pusnes has supplied the electrically driven anchor handling equipment and deck machinery for the M/S Finn Barents, built by Horten Verft for K/S Finnmark Supply A/S, and designed specifically for operation in Arctic waters.

Pusnes also designed and manufactured the technically advanced wire mooring system for a crane barge built by Far East Livingston Shipbuilding Ltd., Singapore. The DC-electrical mooring winches are designed for pipelaying operations in the U.S.S.R.

For free color literature giving complete details on Pusnes Marine and Offshore Services,

Circle 81 on Reader Service Card

Hale Container Line Appoints New Managers

Peter Dodier and **Peter Clark** have been named port managers for Hale Container Line's operations in Boston and Saint John, New Brunswick, respectively. Hale Container Line, Inc. is a three-year-old Baltimore-based transport company that uses barges to provide regular and charter delivery between ports in Canada and the U.S.

Mr. **Dodier** joined Hale in 1986 as an account executive after similar work with U.S. Line.

Mr. **Clark** manages Hale's most northern port operations in Saint John. He spent four years as manager of market development for the Saint John Port Corporation prior to coming to Hale.

Hale Shipping Corporation is a sister company which recently instituted 10-day sailings between Saint John, Boston, and New York/New Jersey Maher Terminal.

Artist's conception of the new 2,200-passenger cruise ferry, which will be built by Wartsila Marine Industries.

Wartsila To Build 2,200-Passenger Cruise Ferry

Wartsila Marine Industries, Inc. has signed a contract with Rederi AB Slite, one of the joint owners of Viking Line, to deliver a cruise ferry in the spring of 1990. The vessel, a sister ship to a ferry ordered last February, will be capable of carrying 2,200 passengers and 475 cars or 62 trailers on her scheduled route between Finland and Sweden.

Rederi AB Slite and Wartsila Marine have worked in close cooperation to ensure that the new vessel will meet or exceed future standards for capacity and quality. There will be 665 cabins, the same as the M/S Olympia, the world's largest car/passenger ferry, which was built by Wartsila. She will be 574 feet long.

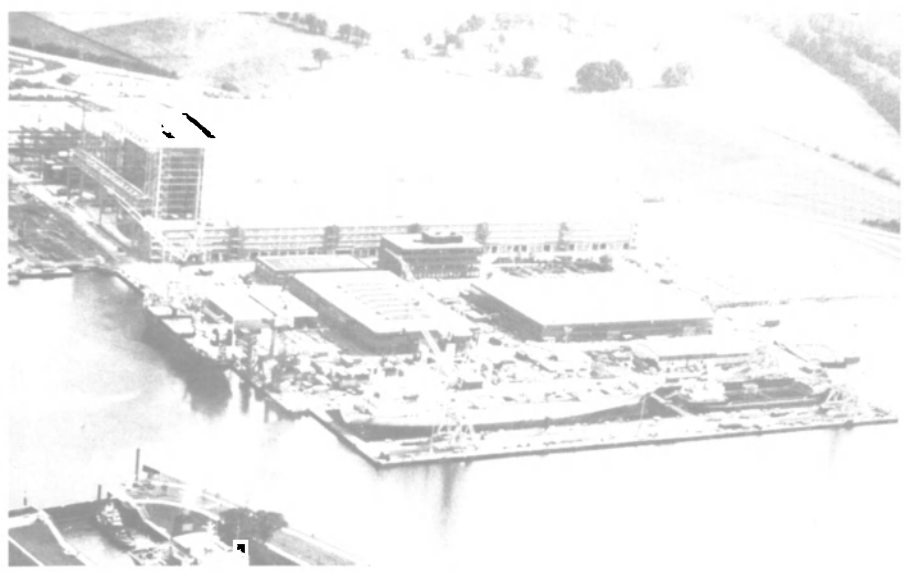
The new cruise ferry will feature a large dining room, buffet-style restaurant, a la carte restaurant, disco, several bars, saunas, playrooms, duty-free stores and nurseries.

The vessel will be equipped with four medium-speed Wartsila-Sulzer 9ZAL40S engines rated at 6,000 kw each. She will be able to reach speeds of 21.5 knots. The engines will be connected to two controllable-pitch propellers through reduction gears. Four Wartsila-Vasa diesel generators will supply 9,000 kw of electricity. Each engine will have its own exhaust boiler and separate cooling systems.

The hull form of the new cruise ferry has been specially designed to minimize wave and suction effects, which is extremely important when the vessels will navigate in the narrow fairways of the archipelago. Fin stabilizers and tanks for controlling trim and heeling reduce sea motion.

For free literature on the shipbuilding and ship-repairing capabilities of Wartsila Marine,

Circle 22 on Reader Service Card

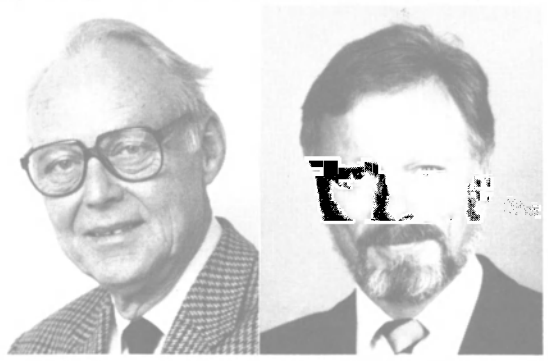


LARGEST IN THE WORLD—The Minister of Economics and Transport of Lower Saxony, West Germany, recently inaugurated Meyer Werft's covered building dock by opening the flooding valves so the Crown Odyssey was floated up for the first time. Said to be the largest covered building dock in the world, the fully covered dock, which will allow the outfitting of the Crown Odyssey during winter weather conditions, has a length of 257 meters (843 feet).

For more information on Meyer Werft's facilities and services, including its new graving building dock,

Circle 82 on Reader Service Card

Rolf Selvig Named New Manager Of Danyard Ship Repair Department



E. G. Sorensen Rolf Selvig

Danyard A/S of Frederikshavn, Denmark, recently announced the retirement of **E.G. Sorensen,** assistant director and repair manager.

The new manager of the department is **Rolf Selvig,** director of ship repairs and general engineering activities.

Mr. **Selvig** was manager of Helsingor Reparationsvaerft A/S from 1985 until the yard was amalgamated with the other Lauritzen yards in 1987. After the establishment of Danyard, he shared the responsibility for all the activities of the yard regarding ship repairs, conversions and industry. In addition, he is a member of Danyard's board of managers.

Danyard, with facilities at Frederikshavn, Aalborg and Elsinore, specializes in servicing both local and international shipping trade in the North Sea and the Baltic.

Aeroquip Offers Rubber Insert Sound Isolation Couplings For Shipboard Applications

Aeroquip's RISIC 3 and 3HT rubber insert sound isolation couplings for shipboard piping applications, are designed to attenuate sound transmissions of machinery and piping, while accommodating various types of pipe movement.

Aeroquip RISIC 3 couplings have been qualified for ship water and oil service to 150 psig and +160°F. Aeroquip RISIC 3HT couplings are approved for feed water service to 150 psig and +250°F.

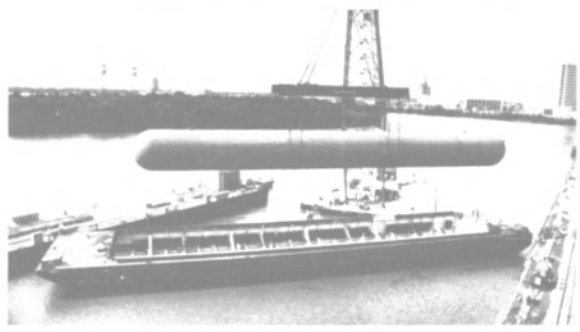
Qualification tests have proven the RISIC 3 and 3HT couplings meet or exceed U.S. Navy requirements for acoustical performance, mechanical impedance, flex pressure cycling, accelerated aging and hydrostatic burst pressure.

Aeroquip RISIC 3 and 3HT couplings offer improved performance by using the natural ability of an elastomer to dampen vibration and sounds, while allowing angular flexibility of ±5° (10° total). Metal reinforcements are molded within the elastomeric bearing to support the internal pressure and axial loads.

Offered in sizes from 3 inches through 10 inches, Aeroquip RISIC 3 and 3HT couplings are available as either complete new units or conversion kits for RISIC 1 units

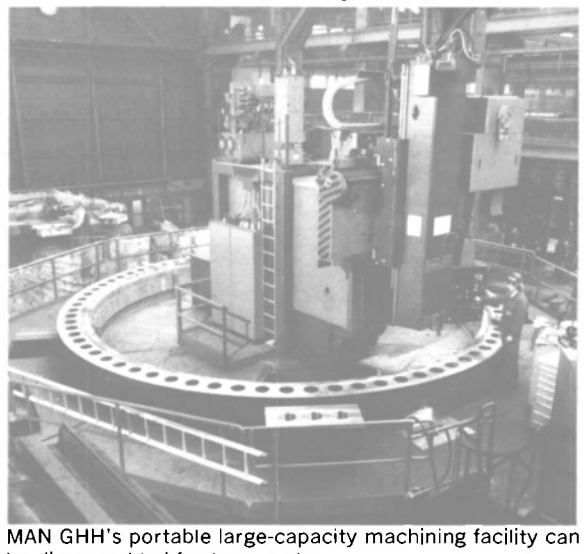
Complete information, including specifications and technical data, cross reference part numbers and materials for Aeroquip's RISIC 3 and 3HT rubber insert sound isolation couplings, can be found in Aeroquip Bulletin 8313. For a free copy,

Circle 73 on Reader Service Card



ONE OF TWO LPG (liquid petroleum gas) tanks built at the Beaumont yard of Bethlehem Steel Corporation is being loaded onto a barge for inland waterway service. Built for Fredeman Shipyard, Sulphur, La., each tank measures 176 feet long, almost 17 feet in diameter, and has a capacity of 281,000 gallons. Fabrication of the two tanks required a total of 480 tons of steel.

MAN GHH Develops Portable Large-Capacity Universal Machine Tool For Shops/Field



MAN GHH's portable large-capacity machining facility can be disassembled for transport.

MAN Gutehoffnungshutte GmbH (MAN GHH) has developed, in collaboration with a machine tool supplier, a portable large-capacity machining facility for the processing of large and heavy components.

The machining unit can be used both at workshops and at erection sites of power stations, chemical factories, refineries, offshore plants, etc. It can be disassembled for transport, with the heaviest unit component, i.e., the positioning turntable, weighing 14 tons.

The new facility can be employed for a great variety of machining operations, including lathing of sealing and mating faces, milling of surfaces and cut-outs in machinery and large pressure vessels, drilling, and thread-whirling.

Technical data: lathing diameter, 4,420 to 12,460 mm; milling diameter, 3,786 to 11,830 mm; vertical spindle adjustment through 2,607 mm, NC control.

For more information and free literature from MAN GHH,

Circle 72 on Reader Service Card

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Required by 39 U.S.C. 3685)

1. TITLE OF PUBLICATION: Maritime Reporter & Engineering News.
   A. PUBLICATION NO. 00253448
2. DATE OF FILING: October 1, 1987.
3. FREQUENCY OF ISSUE: Monthly.
   A. NO. OF ISSUES PUBLISHED ANNUALLY 12
   B. ANNUAL SUBSCRIPTION PRICE: $44.00
4. LOCATION OF KNOWN OFFICE OF PUBLICATION: 118 East 25th Street, New York, New York 10010.
5. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS: 118 East 25th Street, New York, New York 10010.
6. NAMES AND ADDRESSES OF PUBLISHERS AND EDITOR: PUBLISHER: Maritime Reporter/Engineering News, John E. O'Malley, Charles P. O'Malley, 118 East 25th Street, New York, New York 10010. EDITOR: John Snyder, 118 East 25th Street, New York, New York 10010.
7. OWNER (If owned by a corporation, its name and address must be stated and also immediately thereafter the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)
   Maritime Reporter/Engineering News, 118 East 25th Street, New York, New York 10010. Charles P. O'Malley, Maritime Activity Reports, 118 East 25th Street, New York, New York 10010. John E. O'Malley, Maritime Activity Reports, 118 East 25th Street, New York, New York 10010.
8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state.) None.
10. EXTENT AND NATURE OF CIRCULATION:

	Average No. Copies Each Issue During Preceding 12 Months	Single Issue Nearest To Filing Date
A. Total no. copies printed (Net press run)	25,748	26,950
B. Paid Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail Subscriptions	24,515	25,314
C. Total Paid Circulation	24,515	25,314
D. Free Distribution (including samples) by mail, carrier or other means	701	1,213
E. Total Distribution (sum of C and D)	25,216	26,527
F. Copies not distributed		
1. Office use, left-over unaccounted, spoiled after printing	532	423
2. Returns from news agents	None	None
G. Total (sum of E & F—should equal net press run shown in A)	25,748	26,950

11. I certify that the statements made by me above are correct and complete.
(Signed)
Maritime Reporter & Engineering News
John E. O'Malley
Co-Publisher

Sperry Marine Delivers New Type Approved MC 500 Marine Computer

Sperry Marine has completed the delivery of 26 MC 500 Marine Computers to Delmas Shipping, France. This is the first stage component of Sperry Marine's integrated ship management system for use in data communication and spare parts management. Sperry Marine's MC 500 has been type approved by Bureau Veritas, Det Norske Veritas, Lloyd's and Germanischer Lloyd for use as a load calculator.

MC 500 is a ruggedized version of the Unisys Micro IT, a high-speed Intel 80186-based machine. It is smaller, faster and offers the most flexible configuration. Its enhanced graphics color display offers crisp resolution of 640 dots by 350 dots in up to 16 colors for clearer text and easier-to-understand graphics.

MC 500 has undergone extensive environmental, mechanical, electrical and vibration testing. Its certification is the result of unique custom design of our ruggedized assembly. In addition to load calculation, MC 500 can be used with Sperry Marine's various application programs such as the "StarBaud" high-speed data communications program; Spare Parts Inventory Management; Planned Maintenance and Fleet Payroll/Personnel Management programs.

Sperry Marine is a major manufacturer of marine navigation and control systems and a leader in radar and collision avoidance systems for all types of vessels.

For more information and free literature,

Circle 63 on Reader Service Card

Deutz MWM Trademark Gains Wide Acceptance

The new trademark Deutz MWM has gained wide acceptance throughout the world since the beginning of cooperation between Klockner-Humboldt-Deutz AG, Cologne, and Motoren-Werke Mannheim AG, Mannheim, two years ago. It combines the world's two oldest engine builders who had competed with one another for more than a century.

Motoren-Werke Mannheim AG exhibited its full-line four-stroke engine program in Amsterdam this past fall, ranging from 10 to 7,250 kw for marine application. On display for the first time was the 16-cylinder model of the 604B series launched in 1985 with 6-, 8-, and 12-cylinder models. The engines of this series, highlighted by compactness and particular suitability for fast ships, cover a power spectrum from 420 to 1,930 kw.

Two engines of the Deutz MWM series 628, one six-cylinder in-line model and one 12-cylinder V-type model were displayed. Since the introduction of the 628 series eight years ago, contracts for more than 1,000 engines have been placed. About 60 percent of the engine models delivered so far operate as marine marin propulsion units or in onboard auxiliary sets, covering a power spectrum from 755 to 3,470 kw. They can be operated on heavy fuel, including CIMAC 12.

High-speed engines of the Deutz MWM series 816, 234 and 226B were also displayed.

With the current Deutz MWM engine range, it is possible to meet the requirements of varied marine applications in the power spectrum from 10 to 7,250 kw. The engines of the series 234, 604B and 628 are most suitable for the market segment "fast ships," where they are gaining a strong foothold.

For more information and free literature from Deutz MWM,

Circle 33 on Reader Service Card

Lykes Elects Blust, Clark Assistant Vice Presidents

The board of directors of Lykes Bros. Steamship Co., Inc., has announced the election of **Steven R. Blust** as assistant vice president-Liner Services, Mediterranean division, and **Roger L. Clark** as vice president-Washington division.

Mr. **Blust,** a 16-year veteran of the international transportation industry, joined Lykes this year as director of liner services-Mediterranean. He has extensive experience in the intermodal, traffic, sales and marketing aspects of ocean shipping. In his new position, he will be responsible for overseeing and coordinating the line operation of the company's Gulf/East Coast to the Mediterranean containership service including traffic, cargo operations, scheduling and intermodal functions.

Mr. **Clark** joined Lykes in 1985 as director, Traffic, Washington division, bringing 13 years of industry experience to the company. In his new position as assistant vice president-Washington division, he will oversee Lykes' participation in all government-sponsored cargo programs as well as the company's routine contract with the federal agencies that affect the company.

New Reducing Union Branch Tees Can Connect Two Tubing Sizes

Swagelok® Tube Fitting Reducing Union Branch Tees are now available in 316 stainless steel and carbon steel from Swagelok Co., Solon, Ohio.

The new fittings provide size reductions from 2-inch, 1½-inch and 1¼-inch tube O.D. on the tee run down to 1-inch tube O.D. on the tee branch. The design reduces the number of mechanical connections normally required for drops from large to smaller tubing. It provides a smooth flow path, without internal pockets or steps.

As with all over 1-inch Swagelok Tube Fittings, the new tees are easily installed with the aid of the Swagelok Hydraulic Swaging Unit (HSU), a portable tool which swages the ferrules onto the tubing before final assembly into the fitting body.

Applications include direct coupling between supply lines and points of use, automated painting systems, hydraulic systems, process control, and instrumentation.

For more information and free literature from Swagelok,

Circle 43 on Reader Service Card

Hayward Introduces New 90-Page Users' Guide On Pipeline Strainers

The new Hayward Users' Guide is designed to help specifiers avoid costly mistakes caused by improper pipeline strainer selection or application.

Leading off with a comprehensive section on the basics of selecting a basket or Y strainer, the guide then takes the reader through the full line of Hayward metal and plastic pipeline strainers. Here, an extensive assortment of photos, detailed line and cutaway drawings, technical information, selection tables and additional application facts for each strainer model are included.

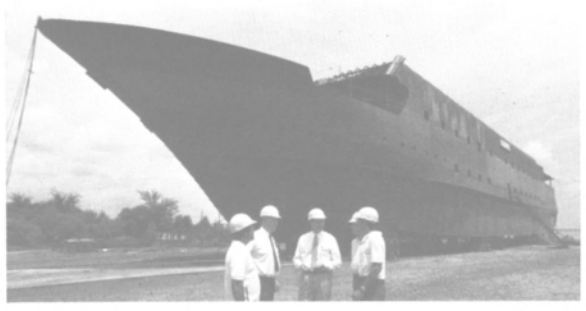
Following this is an up-close look at strainer baskets—describing the various types, providing construction details of both baskets and screens, and then offering extensive specifications on perforated screens and woven wire mesh screens.

Next, a series of Pressure Drop vs Flow Rate curves for simplex, duplex, Y, T and custom-fabricated strainers is included. Finally, data are provided on physical properties and chemical composition of strainers, as well as flow conversion factors, viscosity equivalents, metric-English conversions and suggested specifications.

For more information and a free copy of the Users' Guide from Hayward,

Circle 42 on Reader Service Card

First Coast Shipbuilding Constructing $12-Million Luxury Yacht For Clipper Cruise



The Yorktown Clipper is shown undergoing inspection at First Coast Shipbuilding in Green Cove Springs, Fla. The vessel is scheduled for its first cruise on March 26, 1988.

Clipper Cruise Line recently announced that construction of its Yorktown Clipper is proceeding on schedule, with service slated to begin in March 1988.

After being launched in November, the luxury yacht is being outfitted for an early March christening. The $12-million ship is being built at First Coast Shipbuilding Corporation in Green Cover Springs, Fla.

The 257-foot Yorktown Clipper will accommodate 138 passengers in 69 staterooms. She will retain the characteristic appearance and functionality of her sister ships: all-outside staterooms, teakwood decks and a shallow, 8-foot draft. Interior decor will also follow the lead established by the company's earlier-built vessels, and Clipper will retain single-seating dining on the new vessel.

The Yorktown Clipper's long length will make her more adept along the Maine coast, Florida Keys and in the Caribbean's Leeward Islands, areas which will see new itineraries for Clipper in 1988.

For free literature containing full information on the facilities and capabilities of First Coast Shipbuilding,

Circle 83 on Reader Service Card

Moore McCormack Resources Transfers Ownership And Announces New Address

Moore McCormack Resources, Inc. has recently sold all its marine operations to **James R. Barker,** its ex-chairman.

The company previously known as Moore McCormack Bulk Transport, Inc. has been renamed Mormac Marine Transport, Inc. The principal officers are: **James R. Barker,** chairman; Capt., **Gareth J. Thomas,** president; **Wycliffe L. Bennett,** vice president-chief financial officer; **W. Robert Germain,** vice president-operations; and **Peter Ulvad,** vice president-marketing and administration.

The company operates three U.S.-flag, 39,000-ton Coronado-class tankers in the international trade.

Gastrans, Inc., operator of the two Lachmar U.S.-flag, 125,000 m^3 LNG carriers, retains its original name. Principal officers are: **James R. Barker,** chairman; **Gareth J. Thomas,** president; **Wycliffe L. Bennett,** vice president-chief financial officer; and **W. Robert Germain,** vice president-operations.

The parent company of both Mormac Marine Transport, Inc. and Gastrans, Inc. is Mormac Marine Group, Inc. Principal officers are: **James R. Baker,** chairman; Capt. **Gareth J. Thomas,** president; and **Wycliffe L. Bennett,** vice president-chief financial officer.

All three companies have their headquarters at the following address: Three Landmark Square, 3rd Floor, Stamford, Conn. 06901. The telephone number is (203) 977-8900. Telex numbers remain unchanged—965988; Telecopier number is (203) 977-8989.

Additionally, Mr. **Barker** has acquired the Interlake Steamship Company, which operates nine Great Lakes bulkers. The company retains its name but is now located at the following address: Suite 400, 629 Euclid Avenue, Cleveland, Ohio 44114-3003. Telephone number is (216) 694-4000.

Hempel's Announces Two Senior Appointments In Marine Division

Svend Johnsen — Ron Williams

Two senior appointments in the Marine Division of the holding company of worldwide coatings manufacturer Hempel's Marine Paints were recently announced.

Svend Johnsen was appointed marketing manager. He was previously Hempel's assistant technical director.

Ron Williams, formerly Hempel's worldwide sales coordinator, was appointed sales manager.

Two Caterpillar 3408 diesel engines enable the Cajun Queen to complete an extensive tour of bayous, canals, and locks south of New Orleans in about five hours.

Halter Marine Delivers 600-Passenger Dinner Cruise Vessel 'Cajun Queen'

The Cajun Queen, a 600-passenger dinner-cruise vessel, has been delivered by Halter Marine, Inc. of New Orleans, La., to New Orleans Paddlewheels, Inc.

The 140-foot by 36-foot vessel is now carrying visitors from its Mississippi River berth, at the Riverwalk in New Orleans, on narrated cruises of the bayous, canals, and locks south of the city. Along the way, passengers can sample Cajun cuisine specialties, watch a film highlighting Louisiana's Cajun culture and surrounding wildlife, and see live alligators on board.

The vessel features three decks with enclosed air-conditioned rooms for viewing and private parties and an open promenade deck. Included are Victorian chandeliers, ceiling fans, pressed tin ceilings, bars, bandstands and dance floors food service equipment, and a sophisticated audio visual system for educational and professional programs.

The Cajun Queen was designed by Guarino and Cox Inc. of New Orleans to resemble steamers of the late 1800s. Her 4.5-foot draft permits navigation in the area's shallow waterways and her two Caterpillar 3408 diesel engines enable the extensive tour to be completed in about five hours.

Halter Marine also built the Cajun Queen's "big sister," the Creole Queen, which was delivered in 1984 and now carries passengers on tours of the Port of New Orleans.

For free literature giving complete details on Halter Marine,

Circle 11 on Reader Service Card

Mackay Announces Recent Promotions

Mackay Communications, Inc. recently announced the promotion of **Edward J. Bizub** to manager, satellite communications products. Mr. **Bizub** has more than 18 years' experience in marine communications and has an extensive background in the marketing and sales of INMARSAT satellite communications terminals. He is a former chairman of the IEEE-45 Marine Transportation Committee.

Mackay is the exclusive U.S. distributor for the EB Nera "Saturn" shipboard and transportable INMARSAT satellite communications terminals.

Mackay Communications also announced that **J. Michael Shaw** has joined the marketing department as product manager. Mr. **Shaw** has been with Mackay for 17 years, most recently as manager-contracts department, overseeing the vessel contracts and licensing. Prior to that, he spent many years in the field servicing communications and navigation equipment aboard ships. He will be responsible for sales of Mackay's complete product line throughout the Northeast United States.

Theresa Schmidt was promoted to coordinator of contracts and licensing. She is responsible for interfacing with customers on all matters related to ship licensing and vessel contracts.

PROPULSION UPDATE

Deutz-MWM Offers Extensive Range Of Diesel Engines To Marine Market

—Free Literature Available—

After their merger two years ago, Deutz and MWM, two of the oldest engine manufacturers in the world, streamlined their engine programs and now offer an extensive and overlay range of diesel engines. Deutz-MWM's wide array of marine engines allows the user to select the best possible choice to suit his particular needs.

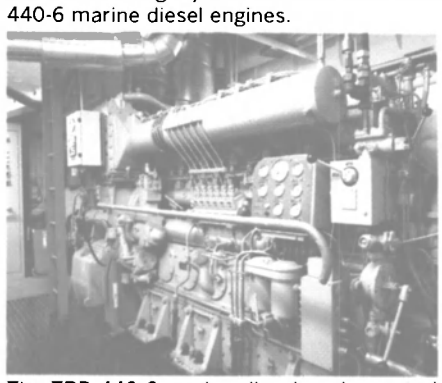
Deutz-MWM offers marine diesel engines from 134 to 9,860 hp. However, this wide power range is not the only advantage. A second and real advantage is the number of choices afforded to a user.

For example, in the 900 hp range, the following options are available: *for a partrol boat or yacht*—TBD 234 V12 marine diesel engine, rated at 979 hp at 2,300 rpm; *fast workboat or ferry*—TBD 234 V16, rated 906 hp at 2,100 rpm; *workboat with extended low-load periods*—BA12M 816, rated 930 hp at 1,800 rpm; *workboat with high-power density and low fuel consumption*—TBD604 BV8, rated at 952 hp at 1,500 rpm; and *workboat with easy maintenance and reliability*—TBD440-6, rated at 979 hp at 900 rpm.

Furthermore, fuel ratings of 190 g/kwh are not confined to engines of more than 2,000 hp. Deutz-MWM engines from 500 hp are now available with this fuel consumption rating. Since fuel may account for up to 80 percent of engine-related operating expenses in a continuously operated vessel, an engine that offers a 210 g/kwh rating as opposed to a 190 g/kwh, means a 10 percent increase in the largest portion of operational cost.

Carbonization in direct-injection engines is a problem when operating at low load for long periods. As a solution, Deutz-MWM offers two-stage combustion engines. On larger engines with four valves, shifting mechanisms are available to allow a low-load optimized system, while keeping a high efficiency and power density at higher ratings as well.

The African tug Djoliba features two TBD 440-6 marine diesel engines.



The TBD 440-6 marine diesel engine, rated at 979 hp at 900 rpm, installed aboard the African tug Djoliba.

Simplicity is a key element in providing easy maintenance on diesel engines. The most serviced component is generally the injector; a block-type injection pump in combination with easily accessible nozzles allows not only the fastest service, but also the least possibility for error.

Many Deutz and MWM engines are in marine service across North America in yachts, ferries, supply and fishing vessels, dredges and cruise liners. Additionally, Deutz and MWM provide service for Murphy Diesel Company engines.

For free literature on the full range of marine diesel engines offered by Deutz-MWM,

Circle 19 on Reader Service Card

PROFESSIONAL

Crowley Maritime Announces Major Organizational Changes

Crowley Maritime Corporation (CMC) recently announced major organizational changes with the consolidating of its Caribbean and Atlantic Divisions; the appointment of **William B. Bru** as president of the new division, to be centered in Teaneck, N.J.; and the simultaneous naming of **Brent A. Stienecker** as president of CMC's Pacific Division, based in Seattle, Wash.

Wiiliam B. Bru — Brent A. Stienecker

Mr. **Stienecker** had been senior vice president and general manager of the Pacific Division since its formation in January 1985. Mr. **Bru** joined Crowley in February 1987 to be senior vice president and general manager of the then-new division providing ocean transportation services between the U.S. and South America, Europe and the Far East.

The restructured unit will operate as the Atlantic Division and will now encompass the operations of Trailer Marine Transport (TMT), Crowley Caribbean Transport (CCT), Crowley Towing and Transportation (CT&T), American Transport Lines (AmTrans) and Pacific Atlantic Navigation (PAN). In his new capacity, Mr. **Bru** will have additional responsibility for the administration of services to and from Central America and the Caribbean, including Puerto Rico.

CLASSIFIED AND EMPLOYMENT ADVERTISING

HOW TO PLACE CLASSIFIED ADVERTISING: Mail clearly written or typed copy to: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010. Include any photos, drawings or logos if required. Specify size of ad and number of insertions . . . Classified Advertising — Per Issue Rate: Classified advertising is sold at a rate of $70 per column inch . . . MARITIME REPORTER'S classified section carries more advertising and sells more products than any other publication in the marine industry. Closing date for classified advertising is 20 days prior to the date of the issue. For further details contact John C. O'Malley at (212) 477-6700. Send all advertising material to MARITIME REPORTER And Engineering News, 118 East 25th Street, New York, NY 10010.

PROJECT ENGINEER

Degreed engineer, preferably Naval Arch/Marine Eng. with 5 years experience in a shipyard design engineering capacity. Candidate should be able to demonstrate the ability to administer and coordinate such projects as fishing, passenger and other small vessels; commercial and government overhauls. U.S. citizenship required.

Please submit your resume in confidence to:

Attention: Chief Engineer

BENDER SHIPBUILDING & REPAIR COMPANY, INC.
P.O. Box 42, Mobile, AL 36601

EQUAL OPPORTUNITY EMPLOYER

Coordinator Wanted
Conoco Inc. Marine Department

We are a major Oil Company with four VLCC's. Requirements of position include a degree in Marine Engineering and some experience with repair and maintenance on tanker ships. Relocation to Houston, Texas a must.

Send resume of previous experience listing education and licenses held to:

Helen Myers, Conoco Inc., P.O. Box 2197, Triangle 3024, Houston, Texas 77252

U.S. NAVAL ACADEMY
at
Annapolis, Maryland

Seeking individuals qualifying for Assistant professor position (tenure track).
Qualifications: An earned doctorate coupled with a strong background in the use of computing in the classroom.
Responsibilities: Assists faculty members with the integration of computer technology into the engineering curriculum. Must teach minimum of one undergraduate course per semester in the area of personal expertise.
Salary: Negotiable depending on experience and qualifications.

Personal expertise is expected to fall within one of the following Engineering disciplines:
Aerospace: Electrical, Mechanical, Naval Architecture, Ocean, Marine, or Weapons & Systems
Position is available June 1, 1988
Closing date: December 31, 1987
Submit letter of application, resume and minimum of three references to:

Director, Computer Services
Ward Hall
United States Naval Academy
Annapolis, Maryland 21402-5045
Attn: Mr. Doug Afdahl (301) 267-3693
(Equal Opportunity Employer)

PORT ENGINEERS

American Systems Engineering Corporation has openings for experienced Port Engineers. Our Port Engineers maintain selected U.S. Navy ships in a Phased Maintenance Program.

Applicants should be degreed Marine Engineers holding USCG Engineer's License. U.S. citizenship is required.

Positions available in Honolulu, Hawaii; San Francisco, CA.

Send resume and salary requirements to:

American Systems
Engineering Corporation
Box 8988
Virginia Beach, VA 23452

ATTENTION

Experienced Docking Pilots needed in N.E. Atlantic Coast of the U.S. Also river & bay pilots in same areas $100,000+ per year.

Send resume of previous experience along with licenses held to Maritime Reporter, Box 1201, 118 E. 25th Street New York, NY 10010

REPS WANTED NAVAL EXP.

We are a long time Mfg. of MIL Spec. Equipment and are seeking REPS. to help us penetrate the Commercial and Naval Ship Yards with the following capabilities and components:

- **REFURBISHING SWITCHGEAR AND RELATED ELECTRICAL CONTROL EQUIPMENT**
- **NEW SWITCHGEAR AND CONTROL PANEL ASSEMBLIES TO MIL SPEC. OR IEEE-45**
- **TRANSFORMERS TO MIL SPEC. OR IEEE-45**
- **MIL SPEC. COMPONENTS**
- **MACHINING OF SHIPSHAFTS AND OTHER LARGE PIECES OF CASTINGS OR EQUIPMENT.**
- **MIL SPEC. COMPONENTS**
- **RESEARCH & DEVELOPMENT PROJECTS**

Our goal is to select REPS, in Key Areas throughout the U.S., with related experience to promote our interests. Please submit Resume or Line Card with a cover letter indicating the territory currently covered and your strengths to:

BOX 1202, MARITIME REPORTER
118 E. 25th, NEW YORK NY 10010

PROFESSOR OF NAVAL ARCHITECTURE
Webb Institute of Naval Architecture

Webb Institute of Naval Architecture is a four year, accredited college of engineering which grants the Bachelor of Science Degree in Naval Architecture and Marine Engineering. The entire student body at Webb Institute is on full scholarship, and the students rank among the best in engineering colleges in the United States. They complete 147 credit hours in the four year program, including a thesis.

Webb Institute, through its research center, also conducts sponsored research work for the maritime industry. The sponsors consist of government agencies (Martime Administration, Navy, Coast Guard), private corporations, and small businesses. The research is accomplished by faculty members with support from research assistants and technicians.

The professor of Naval Architecture is expected to conduct classroom instruction in: basic naval architecture, ship design, and ship production. In addition, he or she is expected to participate in scientific research or engineering projects, and to be active in the affairs of professional organizations.

Applicants must hold a M.S. degree in science or engineering. Either the M.S. or the B.S. must be in naval architecture. In addition, applicants should have experience in: college level teaching, ship design, and shipbuilding. Salary and benefits are competitive and will be based on applicant's experience.

Interested individuals should submit a letter of application and resume to: Dean Edwin G. Wiggins, Webb Institute of Naval Architecture, Glen Cove, NY, 11542. Deadline for application is January 4th, 1988.

Webb Institute of Naval Architecture is an affirmative action and equal opportunity employer.

CHIEF ENGINEER

New York Maritime College Training Ship Empire State desires a full time Chief Engineer. United States Coast Guard Chief Engineer Steam, Unlimited HP license required. Vessel deployed 2 months each summer. Salary in the 40's plus liberal benefits package. Campus housing may be available. Call Master at 212-409-7350 for additional information.

Resume to:

Master, TS EMPIRE STATE
MARITIME COLLEGE
Fort Schuyler, Bronx, NY 10465
AA/EEO Employer

FOR OVER *83* YEARS

Setting the Standard for Service to the Marine Industry

OUR MANY SATISFIED CUSTOMERS INCLUDE:

• U.S. AND FOREIGN GOVERNMENT AGENCIES • INDUSTRIAL FIRMS
• TUGBOAT OPERATORS • BARGE OPERATORS • FREIGHT LINES • TANKER OPERATORS

When It Comes To Marine Equipment . . . Come To Us For What You Need

OUR REPUTATION IS YOUR GUARANTEE OF COMPLETE SATISFACTION
WRITE—WIRE—PHONE

The BOSTON METALS CO.

ESTABLISHED 1904

WAREHOUSE: Scott & McHenry Sts.—Baltimore, MD 21230 • MAIN OFFICE: (301) 539-1900 • TELEX: 197594 ANSWERBACK: BOSIRON BAL
FAX: (301) 727-5250 • WAREHOUSE: (301) 752-1077—Al Berman (Warehouse Mgr)

For Barge Rentals or a Complete Marine Package

Call the Barge People.

Our experience and knowledge in serving a wide variety of industries enables us to provide the right size and type of barge and tow to make your marine operations profitable.

- Large, diversified fleet for inland, oceans and speciality service.
- Experience in arranging and managing marine packages.
- 20 convenient fleeting locations along Gulf Coast and upper river.

Rentals–Sales–Service

New Orleans
(504) 949-7586
Telex 58-4393
2300 Surekote Rd.
N.O., LA 70117

Houston
(713) 452-5887

Parkersburg
(304) 485-4494

St. Louis
(314) 469-0510

McDONOUGH MARINE SERVICE

MASTER OF SCIENCE IN MARITIME MANAGEMENT

MAINE MARITIME ACADEMY, A COLLEGE OF ENGINEERING, TRANSPORTATION AND MANAGEMENT, offers a modular graduate degree program in management of marine-related organizations.

Designed for people who want to advance their careers in maritime industries.

Modular design allows study without career interruption.

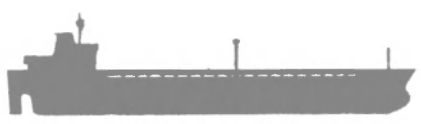
For additional information call or write Mrs. Doris Richardson, Executive Secretary, Department of Graduate Studies (A-6), Maine Maritime Academy, Castine, Maine 04420 USA, telephone (207) 326-4311 extension 485.

4 SINGLE SCREW TUGBOATS

SIZE	HP	GROSS/NET
88'6" x 25' x 11'6"	1200	179/78
83'4" x 22'6" x 11'4"	1600	125/85
88'6" x 25' x 11'6"	1200	179/78
87'0" x 20' x 11'6"	900	124/84

Each is single screw, has quarters, electronics and galley. All are located in the Northeastern U.S. and are offered for immediate sale, as is, where is. For further information or to arrange for an inspection

CALL: **HUGHES BROS., INC.**
212-425-2350



INTERSTATE PILOTS ASSOC., INC.

PILOTING

All Waters Between Norfolk, VA and Portland, ME
Including St. Croix, U.S.V.I.
And All Foreign Flag Ships In
Long Island Sound

RT. 4 BOX 206A
SEAFORD, DE 19973

CABLE ADDRESS
"INTERSTATE SEAFORD DE"

24 HRS. PHONE
302-629-6316

FOR SALE
HEAVY-LIFT SUBMERSIBLE BARGE

400 X 100 X 25 FT., 14,784 MT DWT
6000 MT/HR PUMPING CAP.

JUST FINISHED COMPLETE RENOVATION, DRYDOCKING, CLASS SURVEY, COATING "GOOD AS NEW"

IDEAL USE FOR: CARGO BARGE (DRY OR LIQUID)
CONTAINER CARRIER (935 TEU)
HEAVY LIFT PROJECTS
DRYDOCK

ASKING PRICE: 2 MILLION DOLLARS

CONTACT FOR ADDITIONAL INFORMATION:

TEXAS SEATRADE CORPORATION
1521 Green Oak Place, Suite 110
Kingwood, TX 77339
TEL: (713) 359-1515 TLX: RCA 216406 SEATEX UR

SERVICE • REPAIR • PARTS
CONSULTING • DESIGN

CUNNINGHAM MARINE HYDRAULICS CO., INC.

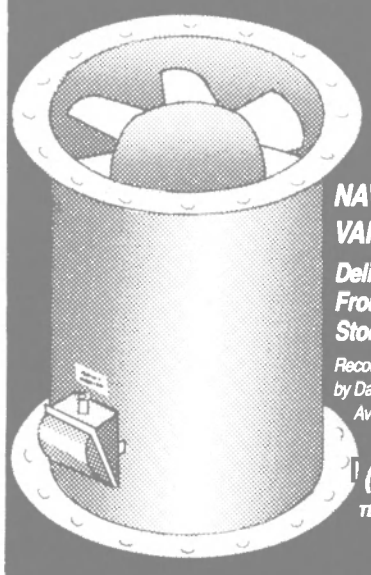
201 Harrison St. • Hoboken, N.J. 07030
(201) 792-0500 (212) 267-0328

2030 E. Adams St. • Jacksonville, FL 32202
(904) 354-0840

TWX 710-730-5224 CMH Hoboken, NJ

JON M. LISS ASSOCIATES, INC.

411 BOREL AVENUE, SUITE 505 • POST OFFICE BOX 5554 • SAN MATEO, CALIFORNIA 94402-0554



NAVY STANDARD VANEAXIAL FANS

Delivery From Stock

Reconditioning and Rewinding by Dahl Beck Electric. Available with Warranty.

(415) 573-9191

TELEX 17-2865 GOJON SMT

FOR SALE

in St. John's, Antigua, West Indies a small marine towing & Salvage co. 36' steel work boat rigged for towing, salvage & water taxi service. Price: 55K For ino. contact: Tom Young 1-809-461-2477 P.O. Box 440, St. John's, Antigua, W.I.

MCM-1 AVENGER • ARS GRASP • MCM-2 DEFENDER

ARS SAFEGUARD • MCM-4 CHAMPION • ARS SALVOR • MCM-2 DEFENDER • ARS GRAPPLE • MCM-3 SENTRY

MCM-3 SENTRY • ARS SAFEGUARD • MCM-5 GUARDIAN • ARS GRAPPLE • MCM-1 AVENGER • ARS SALVOR

GRP Versatility for Today's Shipbuilders

- **Specialists in using GRP materials to meet NAVSEA SPECS**
- **Manufacturers of GRP furniture, stowage racks, and structural components for the MCM and ARS vessels***

*FEDERAL CAGE CODE IDU71

☑ Quality Assurance
☑ Custom Applications
☑ Warehousing Facilities
☑ Registered Professional Engineering
☑ Certified Performance to MIL Standards

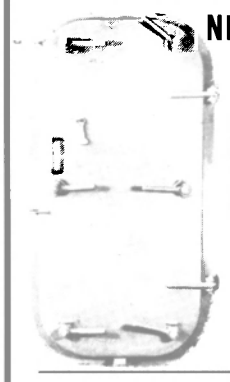
SFGP, Inc.

2330 16th Street South
P.O. Box 875, Wisconsin Rapids, WI 54494
715-424-1512

Specialty fiberglass products for marine applications

MCM-4 CHAMPION • ARS SALVOR • MCM-5 GUARDIAN

FOR SALE



NEW WATERTIGHT DOORS

6 Dog

6-Dog right and left hand hinged doors with frames. ¼" panel and 5/16" frame meet ABS Specs.

SIZES
26"x48" 26"x66"
26"x60" 30"x60"
EACH DOOR

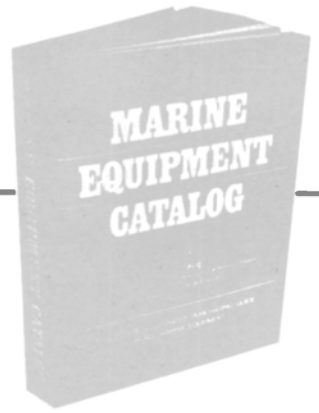
IMMEDIATE DELIVERY

ALSO QUICK ACTING
6-Dog wheel operated doors
5/16" frame-¼" door panel.
26x60 R.H. & L.H. 26x48 R.H.
30x60 R.H. 30x54 L.H.

NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)
14" x 10" CLEAR OPENING
With extended legs for welding to deck. 14" Wide on base—length 28"—height 27¼". IMMEDIATE DELIVERY FROM STOCK.

MARITIME POWER CORPORATION
911 South Wolfe St.
Baltimore, MD 21231
(301) 563-0165 or 0166



ILLUSTRATE YOUR PRODUCTS IN THE WORLD'S MOST COMPLETE MARINE & NAVAL EQUIPMENT CATALOG

NEXT YEAR the Annual MARINE EQUIPMENT CATALOG will offer the most important service to all Vessel Owners, Shipbuilders, Marine Designers and purchasing agents to turn to, to purchase every type of marine and naval equipment that is available.

YOUR products should be part of this data base, in the offices of all N.A.T.O., Navies and *over 12,000* world wide specifyers, buyers and designers of marine and naval equipment.

PRODUCT CATAGORIES ARE LIMITED

Reserve your *illustrated "listing" page* for next year's annual **EARLY!**
(A 7x10 illustration in your "product" category is included with your company logo at the bottom of the page.)

For a sample page and complete details on the WORLD'S MOST EFFECTIVE MARINE & NAVAL ANNUAL CATALOG, call or write:

MARINE EQUIPMENT CATALOG
118 E.. 25th St.
New York, N.Y. 10010

Telephone: (212) 477-6700 Telex: 424768 MARINTI

(Last closing date for illustrations in the 1988 Annual is May 1, 1988)

A Seatrade Conference and Exhibition

Cruise Shipping 88 Now in its 4th year

FONTAINEBLEAU HILTON, MIAMI BEACH, FLORIDA, US FEBRUARY 23–25 1988

THE ANNUAL FORUM FOR THE INTERNATIONAL CRUISE SHIPPING INDUSTRY

THE CONFERENCE

TUESDAY, FEBRUARY 23

Delegate registration and collection of conference documentation. An opportunity to visit the Seatrade Cruise Exhibition which opens at 3.00 p.m. Cocktail Reception: 6.00 p.m.–7.30 p.m.

WEDNESDAY, FEBRUARY 24

Morning:

Introductory address:
A Kirk Lanterman, President, Holland America Line – Westours, Inc, and Chairman, Cruise Lines International Association

Towards the 1990s
Shipbuilding and design
Kai Levander, Manager, Research and Development, Wartsila Helsinki Shipyard

Cruise ships and hotels
Speaker to be announced

Open period for visit to the Cruise Shipping Exhibition

Supply and demand
Dan White, Transportation Analyst, County Securities Ltd, London

The yard perspective
Jean-Francois Cristau, Barry Rogliano Salles, Paris
Panelist:
Knut Kloster Sr., President, Kloster Group
Moderator:
Christopher Hayman, Publisher, Seatrade

Luncheon address:
Carmen J Lunetta, Port Director, Port of Miami

Afternoon

Marketing workshop

The afternoon session will take the form of a panel discussion on strategies for the effective marketing of the cruise product.

Introduction:
Robert H Dickinson, Senior Vice President, Sales and Marketing, Carnival Cruise Lines

Packaging the product:
Bruce Nierenberg, Executive Vice President, Premier Cruise Lines

The medium and the message:
Speaker to be announced

The distribution system:
Jay Silberman, President, and **Debbie Adams,** Vice President, National Association of Cruise Only Agencies (NACOA)

What the passenger actually wants:
Jay L Lewis, President, and **Dr Dan Sarel,** Director, Market Scope, Inc.
Panelist:
Jim Godsman, President, Cruise Lines International Association

During the afternoon session there will be an open period to enable delegates to visit the Cruise Shipping Exhibition

Reception and Dinner hosted by the Port of Miami.

THURSDAY, FEBRUARY 25

Morning

Raising Equity
Public Offerings
Peter Wexler, Vice President, Transportation Group, Salomon Brothers Inc

The commercial banks' role
Speaker to be announced

Open period for visit to the Cruise Shipping Exhibition

Choosing a register and a crew
Speaker to be announced

Insurance
Speaker to be announced

Maximizing on board revenues
Speaker to be announced.

Afternoon

Destinations and Ports
Introduction:
Andreas Potamianos, President, Epirotiki Lines SA and President, Union of Greek Passenger Ship Owners

China and the Far East
Michael Lewis, Deputy Managing Director, The China Navigation Company Limited, Hong Kong

Europe's cruise market
Alf P Pollak, Managing Director, Seetours International GmbH, Frankfurt, W Germany

Open period for visit to the Cruise Shipping Exhibition

The Caribbean theatre
Ferdie R. Martin, Director, Cruise Division, Jamaica Tourist Board

The air connection
Speaker to be announced
Panelists:
Howard A. Fine
Vice Chairman, Costa International B.V.
Ken Page, Director, Passenger Shipping Association, London

Cocktail reception hosted by Portland Ship Repair Yard

FRIDAY, FEBRUARY 26:

Visit to the Port of Miami.

This program may be subject to alteration

Conference Fee: US$525 per delegate. Fee includes conference documentation, lunches, refreshments. an evening reception on February 23, a copy of the latest issues of Seatrade Week and Seatrade Business Review, and a transcript of the conference proceedings.

THE EXHIBITION

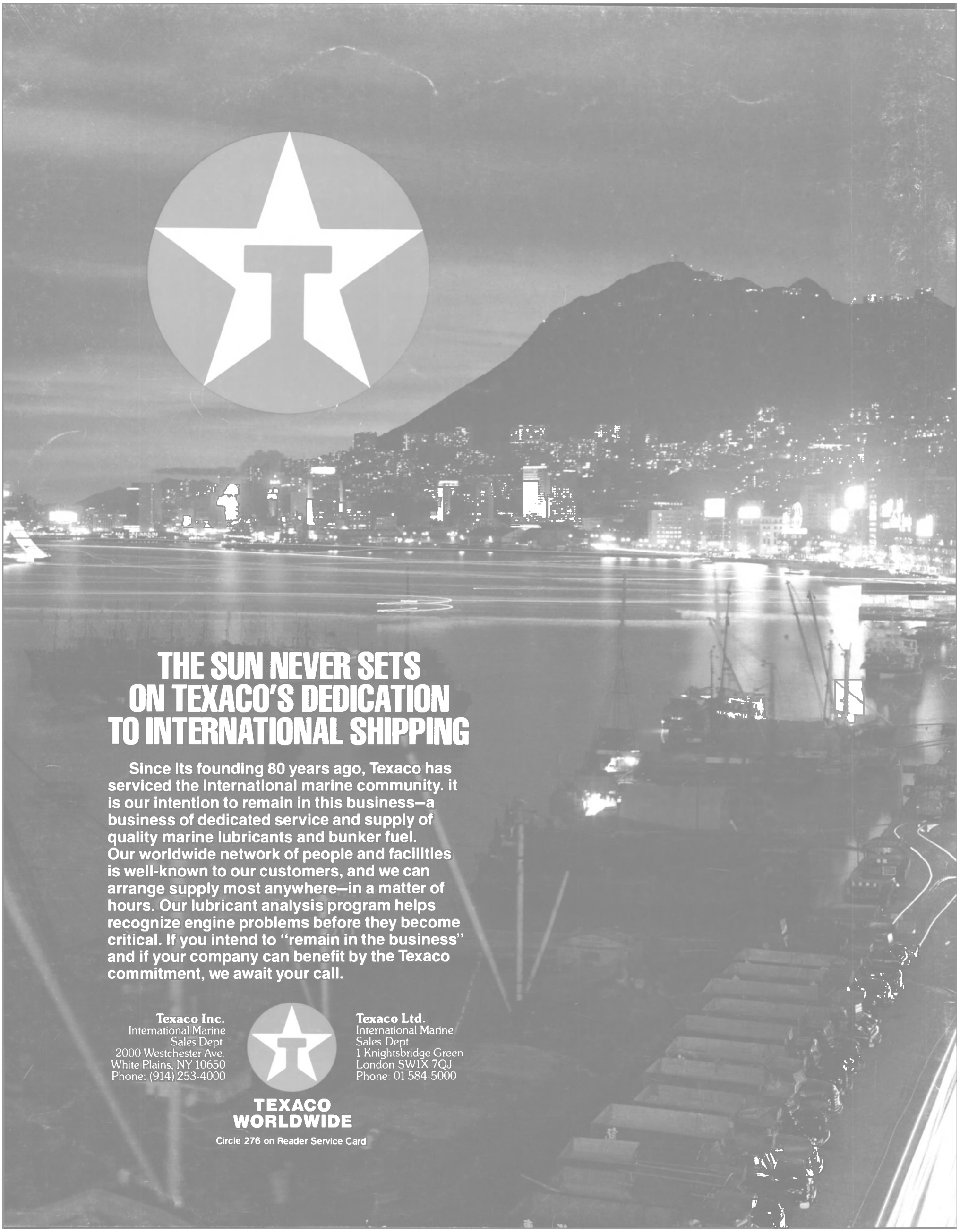
With each staging of CRUISE SHIPPING there is a growing demand for exhibition space. A larger number of exhibition booths has been allocated for Cruise Shipping 88 . . . but already many have been sold to companies anxious to present their services during this major event. **Please indicate your interest in taking exhibition space as quickly as possible to avoid disappointment.** The cost per exhibition booth is US$1475.

To allow conference delegates maximum time to visit the exhibition displays and talk with exhibitors, the Cruise Shipping Exhibition will open at 3.00 p.m. on Tuesday, February 23 when many delegates will be registering and collecting their conference documentation. Exhibitors will also have the opportunity to meet delegates at the Seatrade Cocktail reception that evening. During the following two-day conference program periods have been scheduled when delegates will be free to visit the exhibition.

Major Miami-based companies involved in the cruise industry will be invited to bring their operations and technical personnel to visit the Cruise Shipping 88 Exhibition.

To book your place contact:
The Conference and Exhibition Manager
Seatrade North America Inc Suite 1805
40 Rector Street, New York, NY10006, USA
Telephone: (212) 393 1000/1004
Telex: 233629 SEA UR Fax: (212) 6085874

See You in Miami



THE SUN NEVER SETS ON TEXACO'S DEDICATION TO INTERNATIONAL SHIPPING

Since its founding 80 years ago, Texaco has serviced the international marine community. it is our intention to remain in this business–a business of dedicated service and supply of quality marine lubricants and bunker fuel. Our worldwide network of people and facilities is well-known to our customers, and we can arrange supply most anywhere–in a matter of hours. Our lubricant analysis program helps recognize engine problems before they become critical. If you intend to "remain in the business" and if your company can benefit by the Texaco commitment, we await your call.

Texaco Inc.
International Marine
Sales Dept.
2000 Westchester Ave.
White Plains, NY 10650
Phone: (914) 253-4000

Texaco Ltd.
International Marine
Sales Dept
1 Knightsbridge Green
London SW1X 7QJ
Phone: 01 584-5000

TEXACO WORLDWIDE

Circle 276 on Reader Service Card