

MARITIME REPORTER AND ENGINEERING NEWS



Turecamo Tugs Dock USS Iowa (BB61) On Arrival In New York

**U.S. Navy Ship
Overhaul Market
—Latest Update—**

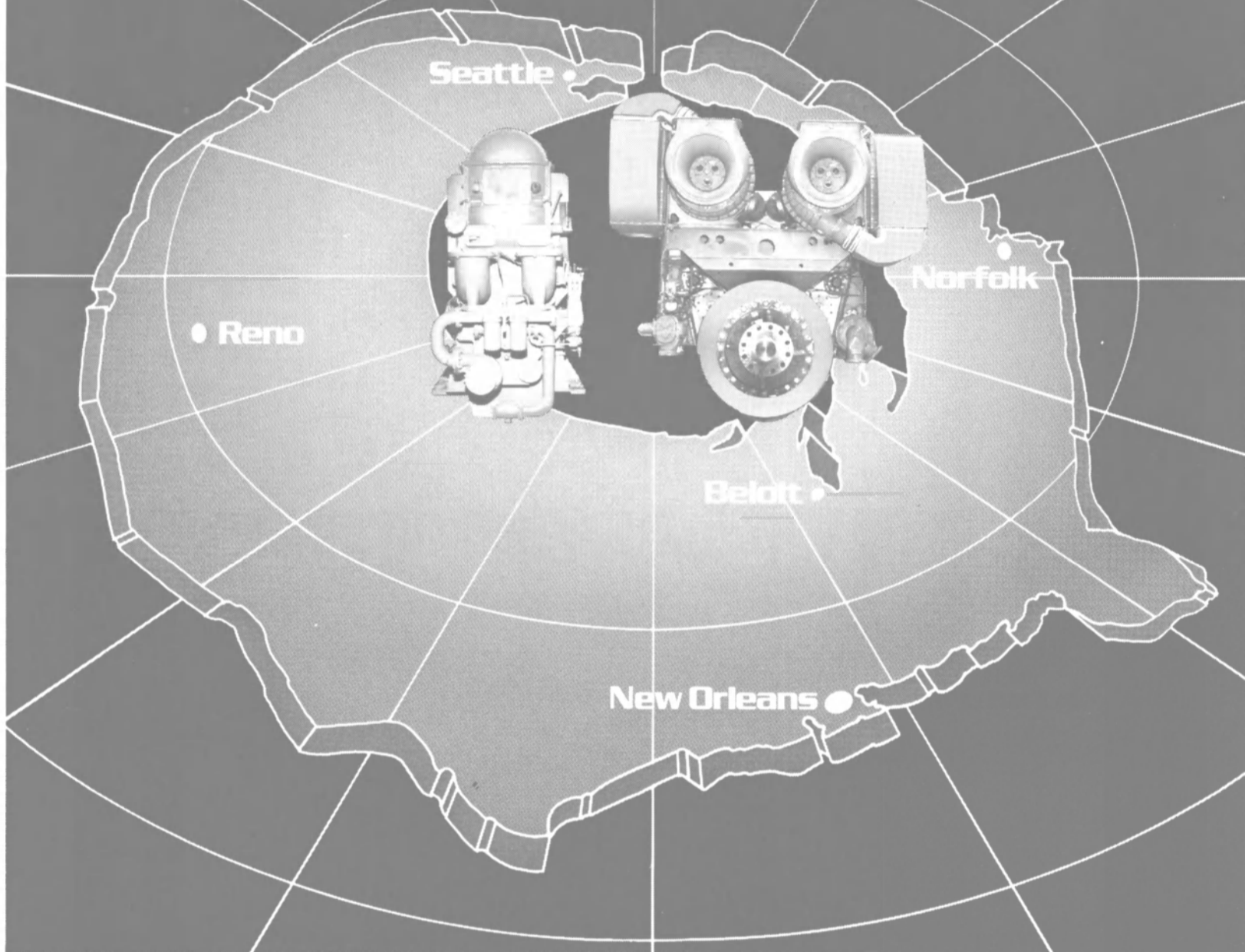
(SEE PAGE 4)

NAVY

NOVEMBER 15, 1984

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Today, no matter where you are you can get Colt engine parts and service fast. 24 hours a day. 365 days per year. We've reshaped the Colt engine service map to provide new centralized parts warehousing and enlarged service facilities to better funnel our service to your maintenance needs. Plus, new computerized inventory control and order processing means you'll have the parts where you need them—when you want them.

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parts and service centers in Seattle, New Orleans, Norfolk and Beloit are being expanded and better equipped to meet your parts and service needs.

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For parts and service program details, contact Colt Industries, Fairbanks Morse Engine Division, 701 Lawton Avenue, Beloit, WI 53511. 800/356-6955.

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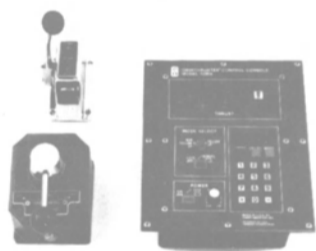


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ON THE COVER

Navy Overhaul Market —First Update—

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USS Iowa (BB-61)

U.S. Navy battleship Iowa (BB-61) being assisted by four Turecamo tugboats during recent visit to New York Harbor, which will become her home port in 1989 as nucleus of a Surface Action Group (SAG) that will also include one guided-missile cruiser and three destroyers. The SAG and two additional frigates will be based at a new Navy facility in Stapleton, Staten Island, to be constructed during 1986-89 at a cost of \$282 million.

The contract to reactivate the Iowa was awarded to Ingalls Shipbuilding in July 1982, with redelivery then scheduled for December 1984. The ship arrived on the Gulf Coast in September 1982, and was drydocked at Avondale Shipyards under subcontract to Ingalls. She arrived at the Ingalls yard in Pascagoula, Miss., in January 1983 for reactivation of her nine 16-inch guns and remaining 5-inch guns, as well as the modernization of living accommodations and installation of modern weapons systems and electronics. Following a revision of the delivery date by the Navy, the Ingalls work force began working extended hours last December to complete the reactivation on the accelerated schedule. Iowa was recommissioned in ceremonies at the shipyard on April 28 this year.

An environmental impact statement released by the Navy in late October this year indicates that the new Stapleton Naval Base will create some 900 permanent civilian jobs and add \$3 million a year to New York City and State revenues.

Upon completion, the project will contain an estimated 5,600 jobs, the majority of which will be held by Navy personnel (4,607) with another 995 held by civilians, the Navy report said. These figures include 163 existing jobs that would be transferred from the Brooklyn Navy Yard. The study further estimates that the base will indirectly stimu-

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late the creation of about 2,600 additional jobs in the civilian economy.

Cover Photo—Donna Svennevik

Miss **Svennevik** is a 29 year old professional photographer specializing in marine subjects. Her grandfather worked aboard sailing ships and her father, **Bob Svennevik**, is the senior vice president of a leading marine firm in New York City. Miss **Svennevik** may be contacted at 44 West 36th Street, New York, NY 10018.

**Norton, Lilly Names Kelly
General Manager of East
Coast And Gulf Services
For Lloyd Brasileiro**

Norton, Lilly & Company, Inc., steamship agents headquartered in New York City, has announced the appointment of **Owen Kelly** as general manager of Lloyd Brasileiro East Coast and Gulf Services.

The Brazilian-flag line maintains independent services from the U.S. Atlantic and Gulf Areas, offering two to three sailings per month from each region to Brazil and Argentina.

**Scientific-Atlanta Awarded
\$5-Million Navy Contract
For Sonar Receivers**

Scientific-Atlanta, Inc. in Georgia has received a \$5-million contract from the Naval Sea Systems Command to produce 15 AN/BQR-23A sonar receiving systems to be installed in U.S. Navy submarines. The new multi-channel, digital signal processor is a major improvement in technology and capability over similar systems now deployed in U.S. and U.K. strategic and attack class submarines.

The AN/BQR-23A was developed by the company's Government Products Division, a major supplier of sonar detection and classification systems to the U.S. Navy.

Scientific-Atlanta is a worldwide manufacturer of communications products, defense systems, and test instruments for industrial, telecommunications, and government applications.

**Western Gear Relocates
Corporate Headquarters
To South Milwaukee**

The headquarters of Western Gear Corporation, a Bucyrus-Erie Company subsidiary that has been situated in Lynwood, Calif., since the early 1940s, has been relocated to South Milwaukee, Wisc., in a consolidation move that is expected to ease and speed communications between parent company and subsidiary. Bucyrus-Erie's corporation headquarters is also in South Milwaukee.

Western Gear officers who will be at the new location include: president **John T. Edelman**; senior vice

president, marketing, **Charles M. Hotes**; vice president, industrial relations, **Scott Cameron**; and vice president, business development, **Hugh B. Chare**. Special projects manager **Denis F. Zaun** will also be at the South Milwaukee office.

Aerospace Group vice president **Saleem S. Naber** will maintain his office in Lynwood and guide the

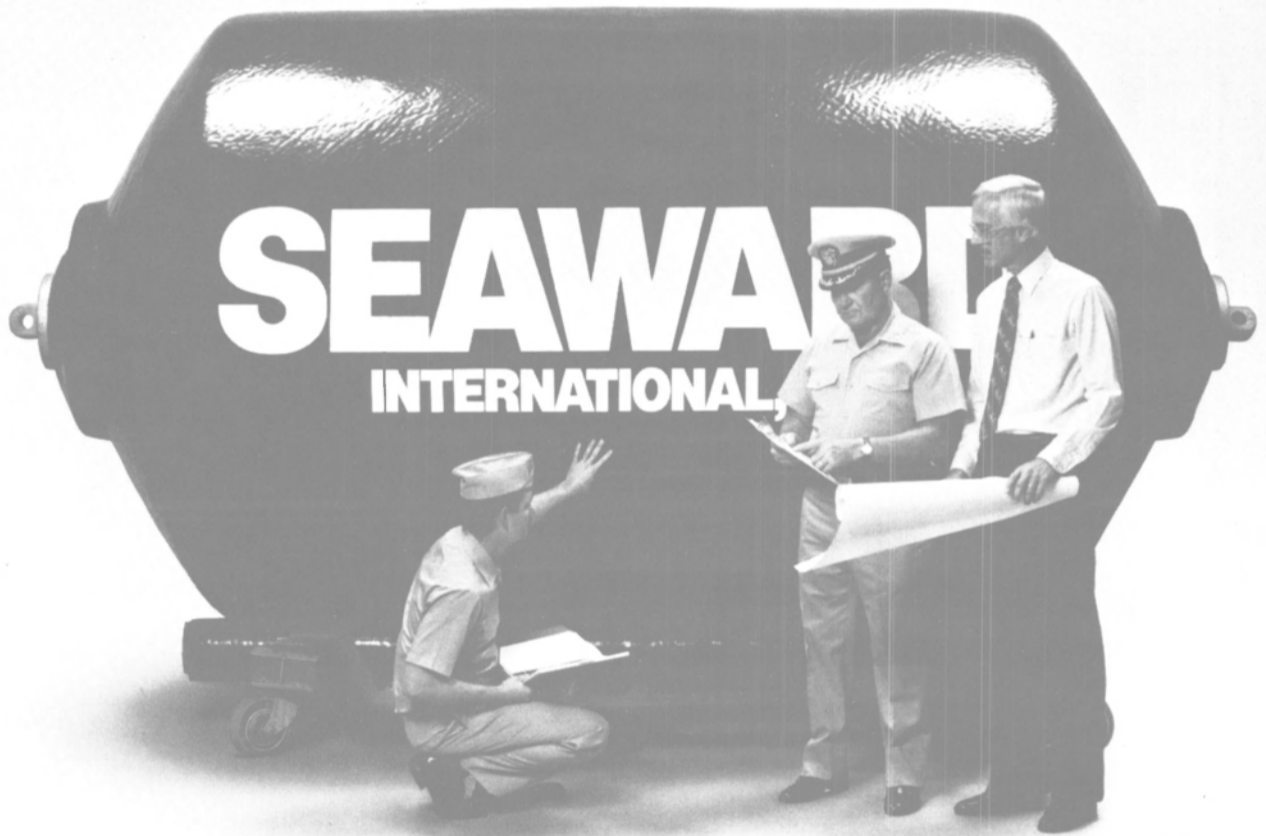
activities of Western Gear's Applied Technology Division in City of Industry, Calif., as well as the company's other aerospace unit, the Flight Structures Division of Jamestown, N.D.

Western Gear corporate operations that will continue at the Lynwood location include: the Corporate Law Unit under the adminis-

tration of **James S. Somberg**, assistant general attorney; Corporate Marketing Communications led by **Thomas D. Vanides**; and West Coast Region sales with **Michael J. Bowl** serving as regional manager.

The new address is Western Gear Corporation, 1100 Milwaukee Avenue, South Milwaukee, Wisc. 53172; (414) 768-4000.

The Seaward dock fender. If the U.S. Navy thinks it's good enough for the 1990's maybe it's good enough for your facility now.



The U.S. Navy has chosen Seaward dock fenders to protect its 20 million dollar project, Pier Zulu. Because of its unique double deck design, Pier Zulu will serve as a prototype for dock facilities well into the 1990's.

Seaward dock fenders are constructed of a tough, snag-free elastomer coating. And Seaward's closed-cell foam center has a very high energy absorption capacity but a low reaction force. These fenders provide stand-off and safely cushion the impact of approaching vessels, whether they're tugboats or battleships. Yet Seaward dock fenders are as easy to install as they are rugged.

The U.S. Navy didn't settle for an ordinary fender to protect Pier Zulu. So why should you? For more information contact Seaward International, 6269 Leesburg Pike, Falls Church, Virginia 22044. Telephone (703) 534-3500, Telex: 275034.



McLean Urges American Shipping Community To Remain Competitive

America took the lead with containerization, and should retain that lead; this success is dependent upon the U.S. retaining its competitiveness in world markets.

These were the thoughts of **Malcolm P. McLean**, the founder of oceangoing containerization, as he received the 1984 Admiral of the Ocean Sea (AOTOS) Award at a recent dinner-dance attended by some 800 shipping management, labor, and government leaders at the New York Hilton.

The AOTOS Award, one of the most prestigious in the U.S. maritime industry, is presented annually by United Seamen's Service for distinguished service to American shipping.

Mr. McLean was the founder of Sea-Land Service, the shipping company that was the world's pioneer in containerization in 1956. Currently president of McLean Industries, which owns United States

Lines, he said that at least half of American cargo should move in American ships. "The freight business is highly competitive in quality of service, time of transit, the actual rate itself, and the overall cost to the shipper customer. These are the key factors in moving cargo whether on land, water, air, or private haulage," he said. He noted that only 25 percent of the world's current container capacity is American.

"The future of the American merchant marine is 100 percent dependent upon a combination of capital investment and the support of the shipper; you cannot get the customer support unless you are competitive," said Mr. McLean. He noted that all facets of the industry have a responsibility to help it prosper, including management and labor. "Unions can't prosper themselves without an industry," he added.

After selling Sea-Land Service to R.J. Reynolds Industries, Mr.



Holding silver AOTOS statue. **Malcolm P. McLean**, this year's recipient of the prestigious Admiral of the Ocean Sea Award, is flanked by **Hoyt S. Haddock** (right), general chairman of the 1984 AOTOS event, and dinner chairman **Shannon Wall**.

McLean's next shipping venture was United States Lines, which his McLean Industries purchased. With his planning and continued innovation, USL is introducing round-the-world service with 12 new jumbo containerships built by and under

construction at Daewoo Shipbuilding in Korea. Other proposed projects will infuse new vigor into other branches of the American shipping community, creating jobs and helping restore U.S. shipping as an important world trader.

Hoyt S. Haddock, general chairman of the 1984 AOTOS event,

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presented the award to Mr. **McLean**, and noted the recipient's penchant to avoid the limelight of publicity over the years. "He is a man who lets his accomplishments speak for themselves," said Mr. **Haddock**.

The AOTOS award is a foot-high silver statue of Christopher Columbus, who was named "Admiral of the Ocean Seas" by Queen Isabella. The statue is individually crafted each year by an Italian silversmith and carried on an American ship for the award ceremony.

C. Plath And Racal Marine Controls Sign Cooperation Agreement —Literature Available

The managing director of C. Plath of Hamburg, West Germany, a division of Litton Industries Inc., announced recently that an agreement for close cooperation with Racal Marine Controls Limited has been signed.

The combined know-how and expertise of these two highly respected companies in the marine field will now be made available to the marine world.

The new Racal-Decca MK 7 and MK 2 marine gyrocompasses based on the long experience of C. Plath in this field will be introduced in September 1984 for deliveries commencing November 1984.

C. Plath has also taken over the shares of Racal Pilot A.S. of Copenhagen. The full production range of Racal-Decca-Autopilots and steering systems will be continued by C. Plath and distributed by Racal Marine Controls Limited as in the past.

For a free brochure and further information,

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Simrit Offers New Catalog On Radial Shaft Seals

One of the largest available lines of standard metric size radial shaft seals is described in detail in a newly published, 28-page four-color catalog that is now available from Simrit Corporation of Arlington Heights, Ill.

In addition to standard sizes, specific design data are also included. Twenty different design versions in a variety of materials are available to meet almost any sealing need for transportation, materials handling, machine tools, construction or electrical industries.

For a free copy of the new Simrit catalog,

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Sandusky Offers Brochure On Centrifugal Castings

Sandusky Foundry & Machine Co. of Sandusky, Ohio, is offering a free 20-page general brochure on the company and the centrifugal castings that it produces exclusively.

The full-color booklet explains what centrifugal castings are and

how they are made, and lists some current applications. These include rolls of many types for papermaking and textile machines; components for cranes, conveyors, diesel engines, and industrial fans; pressure piping including primary coolant pipe for nuclear power plants and headers for fossil-fired power plants; centrifuge bowls; pressure vessels; propulsion shaft sleeves for the marine industry; and preforms for further hot or cold working into thin walled pipe and fittings.

Available sizes of centrifugal castings are discussed—the company offers virtually any O.D. required between 10 and 60 inches—as are Sandusky's capabilities, and quality assurance program that comprises all the planned and systematic actions necessary to provide assurance that its product and its associated documentation meet all of the customer's requirements.

Included are tables of specifications and chemical compositions of high alloy steels, plain carbon and

low alloy steels, as well as non-ferrous compositions.

The publication is generously illustrated with photos of Sandusky personnel engaged in the production of centrifugal castings, and photos showing the many different uses such as paper machines, nuclear and conventional-powered naval vessels, etc.

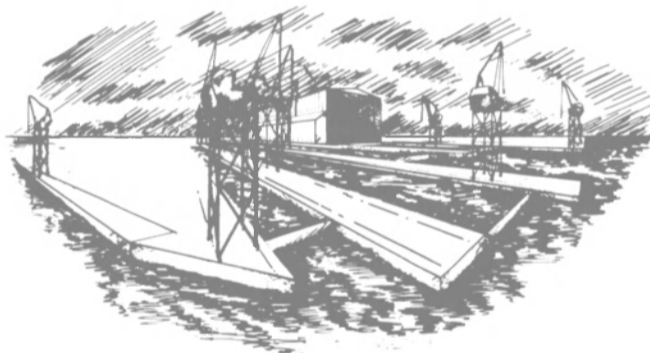
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**We understand a shipowner's need
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550' x 79'

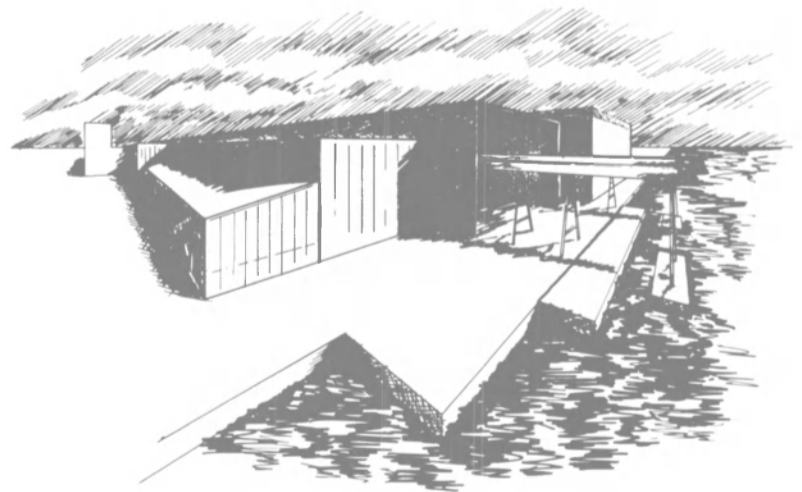
1984 Additions:

- Two graving docks - 750' x 125'
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**Braden Winch Marketing
New Planetary Hoist
—Literature Available**

Braden Winch Company of Broken Arrow, Okla., a Division of PACCAR, is now manufacturing and marketing a 12,000-pound planetary hoist with three-motor and four-drum options, called the PD12B.

The hoist uses the patented Brad-

en HV80 brake valve, which is essentially a sophisticated counterbalance valve that has proven itself by providing the smoothest operation available. The internal, static load-holding brake is spring-applied and hydraulically released. If the engine dies or a hydraulic line breaks, the load is held firmly in place until power is restored.

Features of the PD12 series hoists include roller bearings under the planetary gears, resulting in high efficiency and an increase in duty

cycle. The rope pocket design permits smooth spooling and will hold $\frac{7}{16}$ - to $\frac{1}{2}$ -inch wire rope with standard wedge, and 1- to 1 $\frac{1}{2}$ -inch poly rope with optional wedge. Large cross section O-rings with backup rings will permit full system pressure and will provide long service life and simple installation.

Drain and fill plugs are located on the support end of the hoist to improve accessibility. The motor can be either internally or externally drained for long motor seal life

without affecting the brake operation and mounting.

For further information and free literature on the PD12,

Circle 28 on Reader Service Card

**Killian Named VP Of
H.O. Penn Power Div.**



Henry Killian

Henry Killian has been named vice president of H.O. Penn's Power Division by the company's president, Robert W. Cleveland Jr. In addition to retaining his present duties as vice president and general manager of the Lift Truck Division, Mr. Killian will assume all responsibility for the day-to-day operation of the Power Division functions for the lower New York State and Connecticut territory.

The Power Division offers the full line of Caterpillar diesel and gas-powered engines and generator sets, including marine engines, plus experienced sales engineers, financial advice and assistance, genuine Caterpillar parts, and reliable service.

H.O. Penn has branches in Newington, Conn., and in Armonk, Bronx, Holtsville, Tuxedo, and Poughkeepsie, N.Y. Mr. Killian is based at the Armonk branch; he can be reached at (914) 273-9800.

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**Watterworth Appointed
Vice President-Operations
For General Steamship**

Scott Watterworth has been named vice president-operations for General Steamship Corporation, Ltd. of San Francisco. His new responsibilities will encompass overall management direction of full cargo vessel operations handled by the company's offices in California, Oregon, and Washington.

Mr. Watterworth joined General Steamship in 1958; prior to his recent promotion he had been vice president of trans-Pacific services. Prior to that he was assistant vice president-Northern California operations, and held other managerial positions in several of the agency company's Liner Departments.

General Steamship Corporation, founded in 1920, represents Johnson ScanStar, Pacific Australia Direct Line, Scindia Steam Navigation Company, Pacific Islands Transport Line, and numerous other principals that operate dry bulk and tanker vessels, through its offices in San Francisco, Los Angeles, San Pedro, Long Beach, Seattle, Portland, and Emeryville, Calif.

Maritime Reporter/Engineering News

**Seward,
Alaska**

**Marine Industrial Center
for Lease
and Operation**

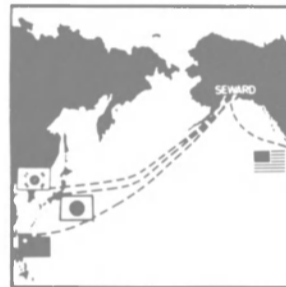


Rendering of future dock facilities

Seward, a progressively minded community located in southcentral Alaska, is looking for private enterprise to invest in this newly completed marine industrial center to serve the maritime and oil industries.

Existing Features

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- Lloyd's certified • 100 acres of graded uplands •
- Lift platform 80' x 300' • Paved highway access •
- Ice free deep water adjacent to site •



Proposal Packet Available Upon Request

City of Seward, Alaska, P.O. Box 167, Seward, Alaska 99664

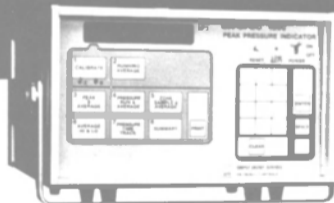
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Digital display shows running average of peak firing pressures. Built-in thermal printer supplies a paper tape record.

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**B&W And Flight Safety
Form New Joint Venture
Training Company
—Literature Available**

Babcock & Wilcox, a McDermott company and a leading supplier to the power industry, and FlightSafety International, a leader in simulator training for both aircraft pilots and ships' officers and engineers,

recently announced the formation of a joint venture international training company. This company, PowerSafety International, will be headquartered in Lynchburg, Va., and staffed by senior B&W and FlightSafety personnel experienced in power generation design and operation, as well as maintenance and training methods.

Albet L. Ueltschi, president and CEO of FlightSafety International, and R. James Ansell, the new president and COO of Power-

Safety International, expressed their optimism about the new company's future and its ability to provide superior services to its current and future customers.

In addition to conducting courses at its training center in Lynchburg, PowerSafety offers a wide program of "hands-on" training through its mobile classroom laboratories. These programs are directed toward operations, maintenance, and engineering personnel.

For additional information and free literature on PowerSafety,

Circle 18 on Reader Service Card

**Hoch Promoted At
Comsat TeleSystems**

Comsat TeleSystems, Inc. has announced the appointment of **Kenneth H. Hoch** as assistant vice president for marketing services and contracts. In this newly created position, he will oversee the company's advertising and promotion, technical documentation/training, and domestic and international marketing analysis/planning programs. In addition, he will continue to have responsibility for the direction of the negotiation and administration of contractual arrangements with TeleSystems' clients and business associates.

Since joining TeleSystems in 1981, Mr. Hoch has held several key positions in the contracts department, most recently as assistant vice president for contracts. He served previously as contracts manager for electronics and communications products at Fairchild Space and Electronics Company.

Comsat TeleSystems, located in Fairfax, Va., designs, manufactures, markets, and provides worldwide service and support for analog and digital processing equipment and systems.

**WABCO Forms Worldwide
Parts And Service Network
—Literature Available**

WABCO Fluid Power, an American-Standard company, has established a worldwide network of six companies to more efficiently service international oceangoing vessels. A free brochure on the new service is available from the Lexington, Ky., company.

The new venture, called WABCO International Service Network, is the result of negotiations with other manufacturers of marine fluid power control products throughout the world in an effort to market and service each other's product lines. Each of the six participating companies is to be supported by distributors in the major ports of the world.

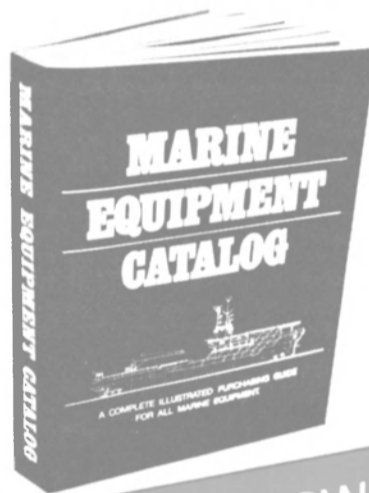
The six companies linked in the network are: WABCO Fluid Power; WABCO Westinghouse, Hannover, Germany; Westinghouse Systems, Chippenham, U.K.; Nabco Nippon Air Brake Company, Kobe, Japan; Mitsubishi Heavy Industries, Miha, Japan; and Westinghouse Marine, New South Wales, Australia.

The companies involved have agreed to stock and service each other's parts. The long-term plan, according to WABCO officials, is to standardize manufacturing techniques, with each company having the capacity to produce one another's products, resulting in a united WABCO parts operation.

For further information and a free brochure on the new WABCO network,

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Joseph F. Abely Jr. (seated, left), chairman and CEO of Sea-Land Corporation, and George K. Geiger, president of Bay Shipbuilding, sign contract for three containerships that will be built at the Wisconsin yard. Looking on are Maritime Administrator Harold R. Shear and Secretary of Transportation Elizabeth H. Dole.

Bay Shipbuilding Awarded \$180-Million Contract To Build Three Containerships For Sea-Land

At a recent contract signing ceremony in the Washington office of Secretary of Transportation Elizabeth H. Dole, Sea-Land Corporation of Menlo Park, N.J., awarded a \$180-million shipbuilding order to Bay Shipbuilding Corporation of Sturgeon Bay, Wisc., a subsidiary of The Manitowoc Company. The contract was signed by Sea-Land chairman and chief executive officer Joseph F. Abely Jr. and Bay Shipbuilding president George K. Geiger.

The contract calls for construction of three diesel-powered, fuel-efficient containerships at a cost of approximately \$60 million per ship. The D-7 class vessels will be deployed to carry containerized cargoes between Puget Sound, Wash., and Anchorage and Kodiak, Alaska. They will fly the U.S. flag and be operated by Sea-Land Service with American crews.

This shipbuilding project will be financed with Sea-Land's Capital Construction Fund (CCF) that is administered by the Maritime Administration. The CCF involves funds received by Sea-Land for the sale in 1981 and 1982 of its eight SL-7 class containerships to the U.S. Navy for use by the Military Sealift Command in the Rapid Deployment Fleet. Four of the eight SL-7s have already been converted and have joined the MSC fleet.

These new 20-knot ships, powered by slow-speed diesel engines and specially strengthened against Alaska's severe winter environment, will replace four smaller steam-powered vessels now operating in Sea-Land's Alaskan service. Each ship will carry more than 700 forty-foot containers, increasing Sea-Land's

box-carrying capacity in the trade by about 40 percent.

"This \$180-million construction project reflects our commitment to the Alaska service and our resolve to operate a fuel-efficient, diesel-powered fleet throughout our worldwide operations," Mr. Abely said. "It is particularly appropriate that we undertake this building project as we approach the 20th anniversary of our December 1964 voyage that began the industry's year-round containership service to Alaska," he added.

The new ships will be of about 16,000 dwt, with an overall length of 710 feet, beam of 78 feet, and design draft of 30 feet. The first keel is expected to be laid in July 1985, with deliveries scheduled August and November 1986 and May 1987. "At peak construction, up to 1,500 new shipyard employees will be required, in addition to those who might be working on other projects," Mr. Geiger said.

Sea-Land Service is the largest U.S.-flag carrier of containerized ocean cargo, operating a fleet of more than 60 containerships that call at 71 ports, serving 59 countries and territories.

Rothermel Named Sales Vice President For Comsat TeleSystems

Comsat TeleSystems, Inc. recently announced that Richard S. Rothermel has been elected vice president-sales. He will be responsible for all activities relating to the sales of TeleSystems' products in North America, including management of

the company's sales representatives, distributors, and direct sales force.

Mr. Rothermel comes to TeleSystems with more than 30 years of experience in the communications industry. Most recently, he served as account executive for the Federal Systems Division of Northern Telecom, where he performed accounts analysis, developed strategy, and coordinated sales efforts. He has

also held sales management positions with the Pulsecom Division of Harvey Hubbel, Inc.; GTE Lenkurt, Inc.; General Electric; and the Philco-Ford Corporation.

Comsat TeleSystems, located in Fairfax, Va., designs, manufactures, markets, and provides worldwide service and support for analog and digital signal processing equipment and systems.



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The USS Iowa (BB61) enters New York harbor through early morning mist accompanied by Turecamo tugs.

Photo—D. Svennevik

U.S. NAVY SHIP OVERHAUL MARKET

First Update — Changes As Of October 1984

Excerpted from a report published by
International Maritime Associates, Inc.

IMA specializes in strategic market planning. Among its more than 60 clients in 18 countries are Allis-Chalmers, Grumman Aerospace, National Inter-group, Ulstein, Mitsubishi, Todd Shipyards, Oppenheimer & Co., Royal Caribbean Cruise Lines and M.A.N.-B&W Diesel.

As one of its services IMA regularly publishes special market

surveys. Each survey provides a comprehensive review of a subject with wide, current interest. Two recent surveys have dealt with the U.S. Navy shipbuilding and ship repair markets. Great expansion in these markets over the past several years has generated much attention.

IMA's most recent report, U.S. Navy Ship Overhaul Market is

*available for \$480. This price includes a concise 173 page report and subscription to four quarterly updates. Please contact: **James R. McCaul**, president, International Maritime Associates, Inc., 1800 K Street, N.W., Washington, DC 20006; Telephone: (202) 296-4615; Telex: 64325.*

Navy ship maintenance and modernization is a multibillion dollar market. It provides numerous sales opportunities for equipment suppliers, service firms and shipyards. Last July International Maritime Associates, Inc., of Washington, D.C. published a comprehensive (continued on page 14)



million (2 percent) of the \$485 million spent on Navy ship maintenance in the region

- Southern California commercial shipyards received \$268 million (57 percent) out of \$472 million spent by Navy in the Long Beach, San Diego areas

- Norfolk area commercial yards received \$575 million (48 percent) out of \$1.2 billion regional depot maintenance

- commercial yards in New England accounted for \$125 million (24 percent) of the \$519 million spent by Navy for depot level maintenance in the region

- homeporting policy of Navy, while a boon to private yards located within the 50 mile "magic circle" radius of large homeports such as Norfolk (123 ships), San Diego (104 ships), and Charleston (68 ships) is "a continuing and agonizing problem to those located outside these areas"

- some medium sized shipyards, through widespread use of subcontracting have retained their small business status

- access to Navy piers and dry-docks has allowed small ship repair businesses to become an artificially competitive force in an already overbuilt repair industry

- some small ship repair businesses awarded contracts under set aside provisions act as brokers, subcontracting up to 75 percent of the work

- Navy's program of strategic homeport dispersal will not likely affect ship repair prospects until FY 1988, given the site preparation, environmental approval and funding process which must still occur

- employment in naval shipyards has increased during the past five years (from 68,300 in FY 1979 to 79,254 in FY 1983), while commercial ship repair yard employment has fallen

The full S&I report is contained in Part 7 (pp. 143-175) of the House Appropriations Committee hearings on the FY 1985 defense budget.

Navy addressed these and other issues in Congressional testimony. Among the recently published Navy comments:

- it opposes the recommendation by private shipyards that Navy drop the 70/30 worksplit formula and in place assign certain type ships to naval yards (e.g., only nuclear powered ships) and award all other ships to the private sector

- overhauls of some less complex ships are performed in naval yards to retain the capability to overhaul all types of ships if and when required

- a rigid ship class allocation policy would be an overly simplistic solution which would reduce Navy's flexibility in workload assignments

- a 50/50 worksplit would reduce employment by 30 percent in the naval shipyards and force closure of the Philadelphia and Long Beach naval shipyards

- a 60/40 worksplit would allow Philadelphia and Long Beach to



(continued on page 16)

Navy Overhaul — Update



(continued from page 15)
continue to operate, but manning requirements at these two yards would be substantially reduced

- no reduction in workforce is scheduled for naval shipyards in FY 1985

- review of return costs of overhauls performed on DD-963, FF-1052, DDG-2, and DDG-37 class ships in the FY 1981-83 programs indicate naval shipyards had a cost advantage over commercial yards (Navy noted there were not many ships involved)

- Navy is reevaluating the small business set aside situation as it recognizes the impact of this policy on larger yards

- the small business criterion of 1,000 employees is probably too large—something like 500 employees would be more appropriate

- \$1.56 billion, or 34.1 percent of total FY 1984 depot level program funding was channelled to the private sector

- 4 percent was for carrier work
- 26.7 percent was for work on submarines and nuclear cruisers
- 69.3 percent was for surface ship work

- 58.7 percent of ship maintenance performed by commercial shipyards in FY 1984 was accomplished in homeport areas

- 54.1 percent of FY 1984 ship maintenance performed by private shipyards was awarded to yards in Norfolk and San Diego

- Newport News accounted for nearly 20 percent of ship repair business assigned to the private sector

- there is a bow wave in nuclear ship overhauls over the next several years

Public/Private Test Competition

Navy plans to conduct a competition between naval and commercial shipyards. The purpose of the competition is to have an apples-to-apples comparison of cost, quality, schedule and other measures of performance. Two similar ships will be overhauled—one in a naval yard, the other in a commercial yard. Navy will monitor the work while in progress. An independent group will be established to review the post overhaul results.

By 1 March 1985 the ships selected for this pilot competition will be designated. Probably two LPD's will be chosen and competition will be on the West Coast. Presumably it will be Long Beach Naval shipyard vs. the successful commercial bidder. In FY 1987 a similar competition will be held on the East Coast. It will most likely involve FF-1052 class frigates.

The Senate Appropriations Committee in its report of the FY 1985 defense appropriations bill provided ground rules for this test competition.

“Overhaul competition—The Committee recommends bill language to permit the competition of two or more ship overhauls between the private and Govern-

ment-owned Navy shipyards. Traditional practice has been to establish a funding limitation on the value of overhauls to be accomplished in naval shipyards. This procedure bears little relationship to industrial planning, nor does it provide an incentive for cost efficiency. The proposed test program would examine the prospect of balancing public and private industrial base concerns while yielding economy through competition. The Committee does not intend for the test program to be a permanent conversion of work to the private sector. Consequently, the test should not be subject to the reporting requirements of section 502 of the Fiscal Year 1981 DOD Authorization Act, as amended, or the cost comparison procedures of OMB Circular A-76. Changes in the industrial fund rate structure in the past few years permit an initial baseline for comparison of public to private shipyard costs. Congressional relief from civilian work force ceilings at industrial activities places public shipyards on comparable footing with private sector work force practices. The recent inclusion of shipyard capital equipment replacement costs in the industrial fund rates conforms to normal business accounting procedures. With some modest adjustments, the naval shipyard cost accounting standards permit the formulation of overhaul price quotations in accordance with competitive bidding procedures.

Bill language provides that the Secretary of the Navy must certify prior to contract award, that the successful bid incorporates comparable estimates of direct and indirect costs for public and private shipyards.

The Secretary of the Navy should report to the Committee on the results of the test and provide an assessment of competition on the public and private shipyard industrial base.”

Victory Ship Reactivation

The House Appropriation Committee added \$4.2 million to the defense budget to reactivate and test two Victory ships now in reserve fleet lay-up.

“In testimony before the Committee, the Navy agreed that there is merit in bringing some victory ships out of lay-up and determining their complete status. The Committee believes that the Navy and MarAd would then be better able to tell if the Victory ships are still a viable asset, and, if so, what the mobilization costs and requirements would be. The Navy has estimated that the cost to bring out a single victory ship and restore it to operational test capability is only \$2.1 million.

The Committee is therefore recommending the addition of \$4.2 million for the Navy to sponsor restoration of two victory ships to operational test capability. The Committee believes that these two ships should be from two different NDRF sites, one on each coast, with the work being bid on a coastwide basis for both ships for completion in private shipyards. Due to the technical expertise which should be required in this restoration, the Navy should use RFP rather than IFB procedures in order to insure technical qualifications as well as cost realism in the bidding process.”

Ready Reserve Fleet

The House Appropriations Committee added \$10 million to fund additional costs to operate and maintain ready reserve fleet (RRF) ships. In preparing its budget Navy anticipated that the ready reserve fleet would consist of 47 ships. The size of the fleet is now expected to be 66 ships within this year.

Navy was also directed by the House appropriations Committee to prepare a plan for dispersing 40 to 50 of the 77 RRF ships projected to be in inventory by 1988. This plan is to be submitted along with the FY 1986 budget request. Additionally, by the end of this year a minimum of six to ten RRF ships are to be relocated to major commercial ports “such as Portland, Mobile and New York City.”

(continued on page 20)

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Exhibit 1

FY 1985 Ship Overhaul and Modernization Budget
(in millions of dollars)

	Original Adm. Request	Amended Adm. Request	Authorization Legislation			Appropriations Legislation		
			House Authorization	Senate Authorization	House/Senate Conference	House Appropriation	Senate Appropriation	House/Senate Conference
Total Navy Operation & Maintenance	\$26,248.4	\$25,494.8	\$25,437.8	\$25,633.5	\$25,449.9	\$24,688.9	\$25,390.3	\$25,116.2
Depot Level Ship Maintenance Budget	5,491.4	5,171.0	5,487.4	5,300.6	5,497.4	5,387.4	5,402.8	5,465.9
Ship Overhauls	2,810.4	2,490.0	2,881.4	2,619.6	2,816.4	2,781.4	2,721.8	2,784.9
No. of Overhauls	(56)	(54)	(58)	(55)	(58)	(58)	(56)	(58)
Restricted Availabilities	1,200.9	1,200.9	1,200.9	1,200.9	1,200.9	1,200.9	1,200.9	1,200.9
Ship Alterations	1,480.1	1,480.1	1,405.1	1,480.1	1,480.1	1,405.1	1,480.1	1,480.1

Note: See INA published update for explanation of differences in the amounts requested, authorized and appropriated.
Sources: Senate and House Committee Reports on Defense Authorization and Appropriation Bills.

Exhibit 2

MSC Ship Overhaul Contract Awards

Hellenic Shipyard	Generators replaced on Harkness (TAGS-32)	Norshipco	Sealift China Sea (TAOT-170)
Baswell	Wyman (TAGS-34); Powhatan (TATF-166)	Coastal Drydock	Rigel (TAF-58)
San Francisco Welding	topside work on Northern Light (TAK-284)	San Francisco Welding	Meteor (TAKR-9)
Todd San Francisco	drydock work on Northern Light (TAK-284)	Westwind San Francisco	Comet (TAKR-7)
Houston Ship Repair	topside work on Sealift Indian Ocean (TAOT-171)	San Diego Iron & Steel	Desteiguer (TAGOR-12)
Tampa Ship	drydock work on Sealift Indian Ocean (TAOT-171)	Service Engineering, S.F.	Spica (TAFS-9)
Northwest Marine	Observation Island (TAGM-23)	Hoboken Shipyard	Range Sentinel (TAGM-22)
Hoboken Shipyard (Bayonne)	Albert J. Myer (TARC-6)	Coastal Drydock	PAWCATUCK (TAO-108)
Detyens	Sealift China Sea (TAOT-170)	Alabama Drydock	Maumee (TAOT-149)

Source: Military Sealift Command

Exhibit 3

Navy Overhauls and Restricted Availability Contracts
FY 81 - FY 85

* indicates contracts awarded since June 1984

EAST COAST			1983	PM	AFS 5
Bath				PM	AFS 6
* 1985	ROH	DD 989		SRA	AFS 2
1984	ROH	DD 979	1982	PM	AFS 2
*	ROH	DD 987		PM	AFS 6
*	ROH	FFG 5	1981	SRA	AFS 6
1983	ROH	FF 1082		SRA	AFS 5
	ROH	FF 1093	General Ship		
1982	ROH	DDG 41	* 1985	PM	FF 1091
	ROH	FF 1080	*	SRA	FF 1096
	ROH	FF 1061	* 1984	NRT	DD 946
	ROH	FF 1043		ROH	FF 1089
	ROH	FF 1044		PM	FF 1091
Newport News				PM	FF 1096
1984	RO/RF	SSBN 659	1983	SRA	FF 1096
	RO/RF	SSBN 628	1982	ROH	FF 1040
1983	RO/RF	SSBN 656		ROH	AR 5
	RO/RF	SSBN 657	1981	ROH	DD 944
	COH	CVN 68		SRA	FF 1056
1982	RO/RF	SSBN 654	Hore Bros.	SRA	FF 1096
	RO/RF	SSBN 655	1983	ROH	LSD 34
1981	RO/RF	SSBN 616		SRA	FF 1092
Coastal	RO/RF	SSBN 644	1982	ROH	LST 1193
* 1984	ROH	DD 980		ROH	ARS 40
*	ROH	DD 982		SRA	FF 1090
*	ROH	FF 1059		SRA	FF 1085
	ROH	FF 1085	1981	ROH	LST 1188
	ROH	FF 1094		ROH	LST 1190
1983	ROH	FF 1047	Jacksonville		
	ROH	FF 1049	* 1984	SRA	FFG 16
	ROH	FF 1084	*	SRA	DDG 10
	ROH	DD 978	*	SRA	DDG 19
1982	ROH	AE 23	*	NRT	MSO 441
	ROH	LPD 15	1983	SRA	AVT 16
	ROH	LKA 113		SRA	CV 60
1981	ROH	AOR 4		SRA	FFG 13
	ROH	FF 1078		SRA	FF 1068
Detyens				SRA	FFG 15
1984	ROH	MSO 448	1982	SRA	CV 59
*	NRT	MSO 442	1981	SRA	FF 1082
*	ROH	LST 1180		SRA	FF 1059
1983	ROH	MSO 490	Norshipco		
1982	ROH	ARDM 2	* 1985	SRA	DDG 995
1981	ROH	MSO 448	*	PM	AO 186
	ROH	ASR 14	* 1984	SRA	DDG 993
	ROH	MSO 430	*	PM	AO 178
	ROH	MSO 443	*	PM	AO 179
Jonathan			*	SRA	DD 970
* 1985	PM	AFS 5		SRA	CG 34
*	PM	AOR 2		SRA	DDG 46
1984	PM	AFS 5		SRA	DDG 995
*	PM	AFS 2		SRA	CG 26
*	PM	AFS 6	1983	ROH	AFDM 7
*	PM	AOR 2		ROH	LST 1179
*	ROH	FF 1092		SRA	FF 1094
	SRA	AOR 4		SRA	CG 17

(Exhibit 3 continues on page 18)

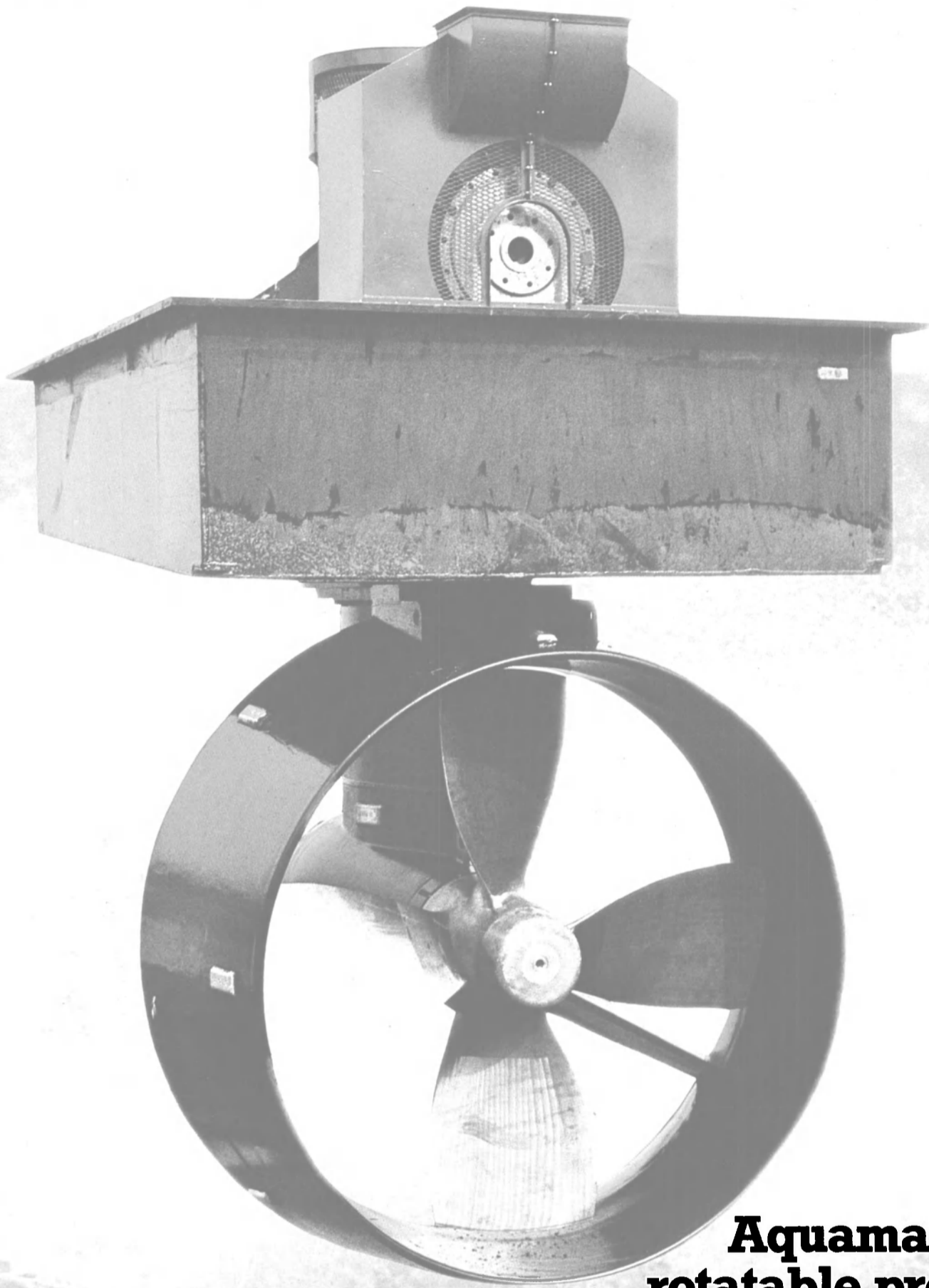
Navy Overhaul — Update



(Exhibit 3 continued from page 17)

1982	ROH	LST 1196	*	SRA	DDG 15
	ROH	AOE 4	*	SRA	FF 1050
	ROH	ARS 8		ROH	LST 1182
	ROH	LST 1197		SRA	FFG 1
	SRA	FF 1095		ROH	FF 1076
	SRA	CG 26			
1981	ROH	LST 1194	Triple A		
	ROH	ATF 160	1983		
	ROH	LSD 32	1984	ROH	AS 37 (SD)
	ROH	ASR 13		ROH	FF 1069 (SD)
	ROH	LPD 4	*	ROH	IX 501
			1983	ROH	MSO 439 (SF)
Metro Machine				ROH	AR 6 (SD)
1984	SRA	DD 968		ROH	AE 33 (SD)
*	SRA	FF 1097		SRA	CVN 65 (SF)
*	ROH	LPD 14		ROH	LKA 116 (SD)
	ROH	LKA 117		ROH	LSD 36 (SD)
1983	ROH	LPD 13		ROH	AOR 5 (SF)
	SRA	FF 1095		SRA	LHA 3 (SD)
1982	ROH	LST 1192		ROH	LST 1189 (SD)
	ROH	AO 98		ROH	LSD 40 (SF)
	SRA	CG 34		ROH	LST 1195 (SD)
				ROH	ASR 9 (SD)
Atlantic				SRA	CGN 35 (SD)
1984	SRA	FFG 21	Lake Union		
*	SRA	FFG 20	*	DSRA	MSO 437
*	SRA	FFG 24	*	DSRA	MSO 488
*	SRA	FF 1080	*	DSRA	MSO 455
	SRA	CG 19		ROH	MSO 488
	SRA	FF 1043		SRA	MSO 492
1983	ROH	MSO 449		DSRA	MSO 438
	SRA	FF 1059		ROH	MSO 438
	SRA	FFG 11		ROH	MSO 455
	SRA	FFG 8		ROH	MSO 437
	SRA	FFG 7			
1982	ROH	MSO 433	Southwest		
1981	SRA	FF 1080	*	PM	AOR 7
	SRA	FFG 7	*	SRA	FF 1065
	SRA	AVT 16	*	PM	AOR 1
	SRA	FF 1061	*	PM	AOR 5
			*	SRA	DD 971
			*	SRA	FF 1037
Braswell				SRA	DDG 12 (SD)
1984	SRA	FF 1078		SRA	DD 966 (SD)
*	SRA	FF 1040		SRA	FF 1053 (SD)
*	ROH	AO 99 (NY)		SRA	FFG 14 (SD)
1983	ROH	AOR 6 (NY)		SRA	AOR 3 (SF)
	SRA	FF 1081		SRA	DD 967 (SD)
				ROH	LKA 115 (TI)
GULF Ingalls				ROH	AE 35 (SF)
1985	ROH	DD 988		SRA	FF 1066 (SD)
1984	ROH	DD 983		SRA	FF1054 (TI)
	ROH	DD 974		SRA	FF 1065 (SD)
1983	React	BB 61		SRA	DDG 24 (SD)
	ROH	DD 977		SRA	FFG 12 (SD)
	ROH	DD 981		SRA	DD 965 (SD)
1982	ROH	DD 970		ROH	LPD 10(SD)
	ROH	DD 969		ROH	LPH 3 (SD)
	ROH	DD 968		ROH	LPD 8 (SD)
1981 WEST COAST NASSCO				SRA	FF 1083 (SD)
1985	ROH	LST 1198		SRA	FF 1053 (SD)
*	ROH	LST 1183		SRA	FF 1069 (SD)
*	SRA	CG 22		ROH	LST 1198 (SD)
*	SRA	CG 30		ROH	ATF 110 (SD)
*	ROH	FF 1083		ROH	LKA 114 (SD)
	ROH	LST 1184		ROH	AE 24 (SD)
	SRA	CG 16	Todd		
1983	ROH	LST 1187	*	SRA	AFS 1 (SF)
	ROH	FF 1055	1984	ROH	FF 1070 (Seat)
	ROH	LST 1186	1983	PM	AFS 3 (SF)
	SRA	CG 22		ROH	ARS 38 (SP)
	SRA	FF 1063		ROH	ATF 105 (SP)
	SRA	CG 29		SRA	FFG 9 (SP)
1982	SRA	FF 1055		SRA	FFG 10
	SRA	FF 1076		SRA	AR 7 (SF)
	SRA	FF 1088		ROH	FF 1073 (Seat)
	SRA	DD 976		ROH	AOR 7 (SF)
	SRA	FF 1058		ROH	AFS 1 (Ala)
1981	SRA	FF 1088		SRA	CV 43 (Ala)
	SRA	FF 1083		ROH	LPD 7 (SF)
	SRA	FF 1069		ROH	FF 1063
	SRA	FF 1058		ROH	LST 1191 (SP)
	SRA	FF 1066		ROH	DD 967 (Seat)
	SRA	FF 1070			
	SRA	FF 1054	Dillingham		
SDI			*		
1985	SRA	FFG 23		ROH	ARS 42
*	SRA	FFG 25		ROH	ATS 3
*	SRA	FFG 27		ROH	ARS 39
*	SRA	DDG 7		ROH	ATS 2
*	SRA	DDG 12	Lockheed		
*	SRA	FF 1051	1982	ROH	DD 971
*	SRA	FFG 19		ROH	DD 975
*	SRA	FFG 3		ROH	DD 972
*	SRA	DDG 8	1981	ROH	AOE 1
*					

Source: Naval Sea Systems Command



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Navy Overhaul — Update

(continued from page 16)

Homeport Policy

House/Senate conferees on defense appropriations directed that Navy terminate its policy of reserving 30 percent of ship overhauls to homeport yards:

The conferees agree that current

Navy policy with regard to homeport reservation does not recognize that ship maintenance and repair workload has, over the past several years, gradually increased the proportion being accomplished during Selected Restricted Availabilities (SRA) as opposed to during major over-

hauls. While this change toward SRAs is beneficial for operational requirements, and is cost-effective, the practice of allocating 100% of SRA workload to homeport areas and also continuing to reserve a minimum of 30% of the ship overhauls for these same homeports ignores the long-term

adverse impact on the mobilization capability of critical non-homeport private shipyards. The conferees therefore agree that the Navy may reserve SRAs for homeport areas, but direct that the reservation of an arbitrary 30% of ship overhauls be terminated. However, to minimize the disruptive impact on Navy families associated with overhauls, up to 2 overhauls may be reserved for a single homeport during any one fiscal year. Inasmuch as this is an item of congressional interest, no funds are available to deviate from this policy without submission of a prior approval reprogramming to the Committees on Appropriations.

Master Repair Certification

Appropriation conferees also directed strong language at ship repairers who rely on performing work alongside Navy piers:

The conferees agree that private shipyards without access to non-Navy piers and drydocks are disruptive to Navy operational requirements, contribute little to the industrial mobilization capability of the United States, and should therefore be immediately decertified from receiving further Navy ship repair, alteration, and overhaul work.

2. INDUSTRY ACTIVITY

Business continues to be depressed at most U.S. yards. Repair of commercial ships is impacted by the strong dollar. Lack of commercial construction and repair work has focused attention on the Navy overhaul market. Competition for available work is fierce.

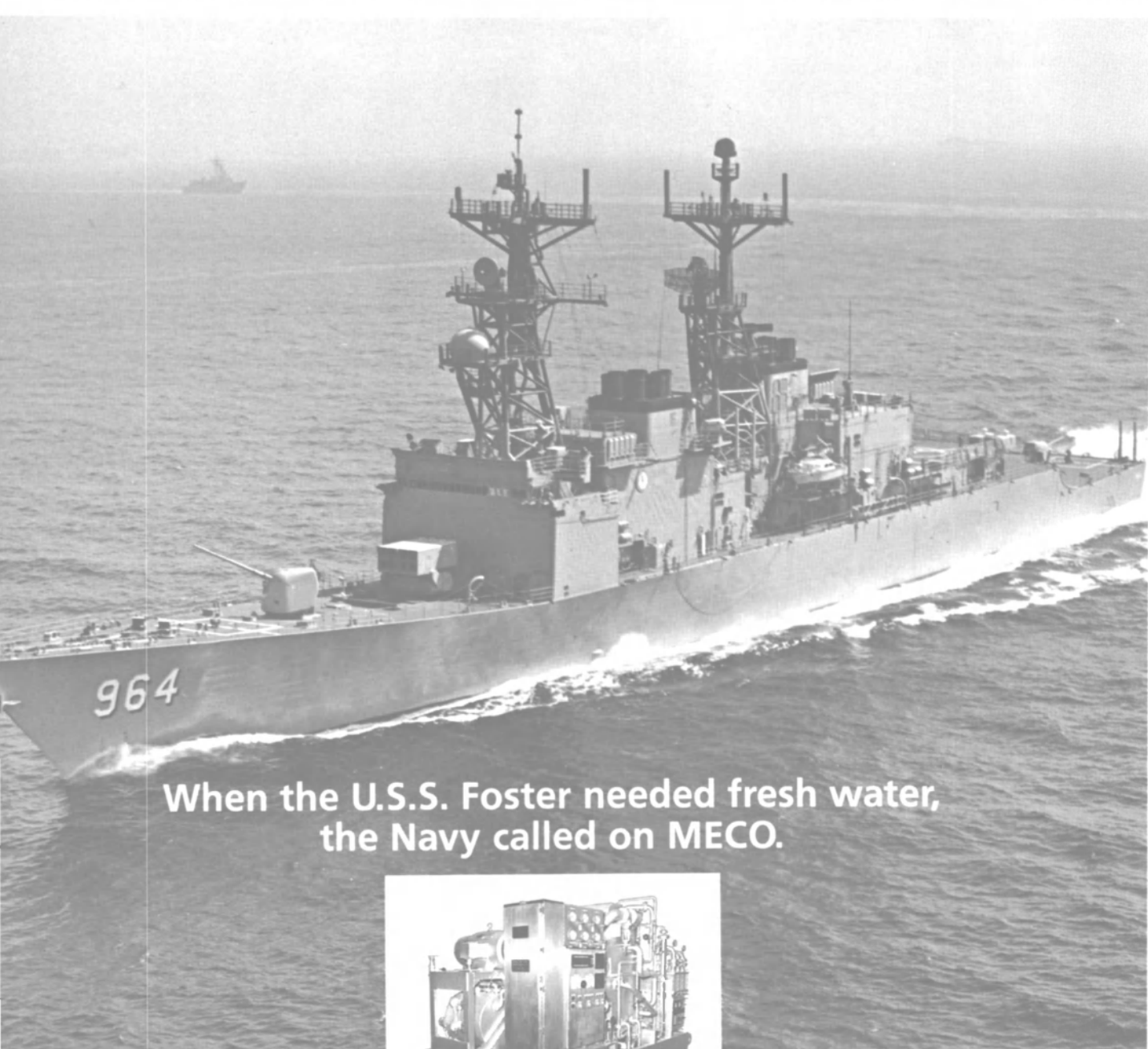
Braswell

As a result of financial complications with its lending group, Braswell petitioned on 13 August for protection under Chapter XI of the Bankruptcy code. On 15 August the Bankruptcy Court of South Carolina granted Chapter XI protection. The court at that time made available \$4.2 million in operating funds.

The firm is in the process of developing a reorganization plan. This plan will include phasing down operations in Hoboken and consolidating future New York area work in Bayonne. The firm is actively considering sale of the Hoboken site.

Braswell continues to market its New York/New Jersey area ship repair capabilities. Drydocking for the current Navy contract is to be accomplished in the 1052' Bayonne graving dock. Shops at the Hoboken yard continue to be used.

(continued on page 22)



When the U.S.S. Foster needed fresh water, the Navy called on MECO.



"We ride on the current."

That's the crew's slogan for the all-electric U.S.S. Foster DD964. Now MECO is riding the current with the U.S.S. Foster and its crew.

As part of the Navy Retro-Fit program to eliminate the ship's need for steam-driven auxiliaries, MECO was selected and awarded a Navy contract to design and build two Mil Spec 400 GPH, all-electric vapor compression distillers for the U.S.S. Foster. These units now furnish 100% of the ship's fresh water.

This contract followed a successful evaluation test program conducted by the Navy on a MECO 400 GPH commercial marine design vapor compression distiller aboard the U.S.S. Thorn DD988. Another Mil Spec unit was awarded and built which successfully completed operational and performance testing, and shock and vibration evaluations.

As the world leader in pack-

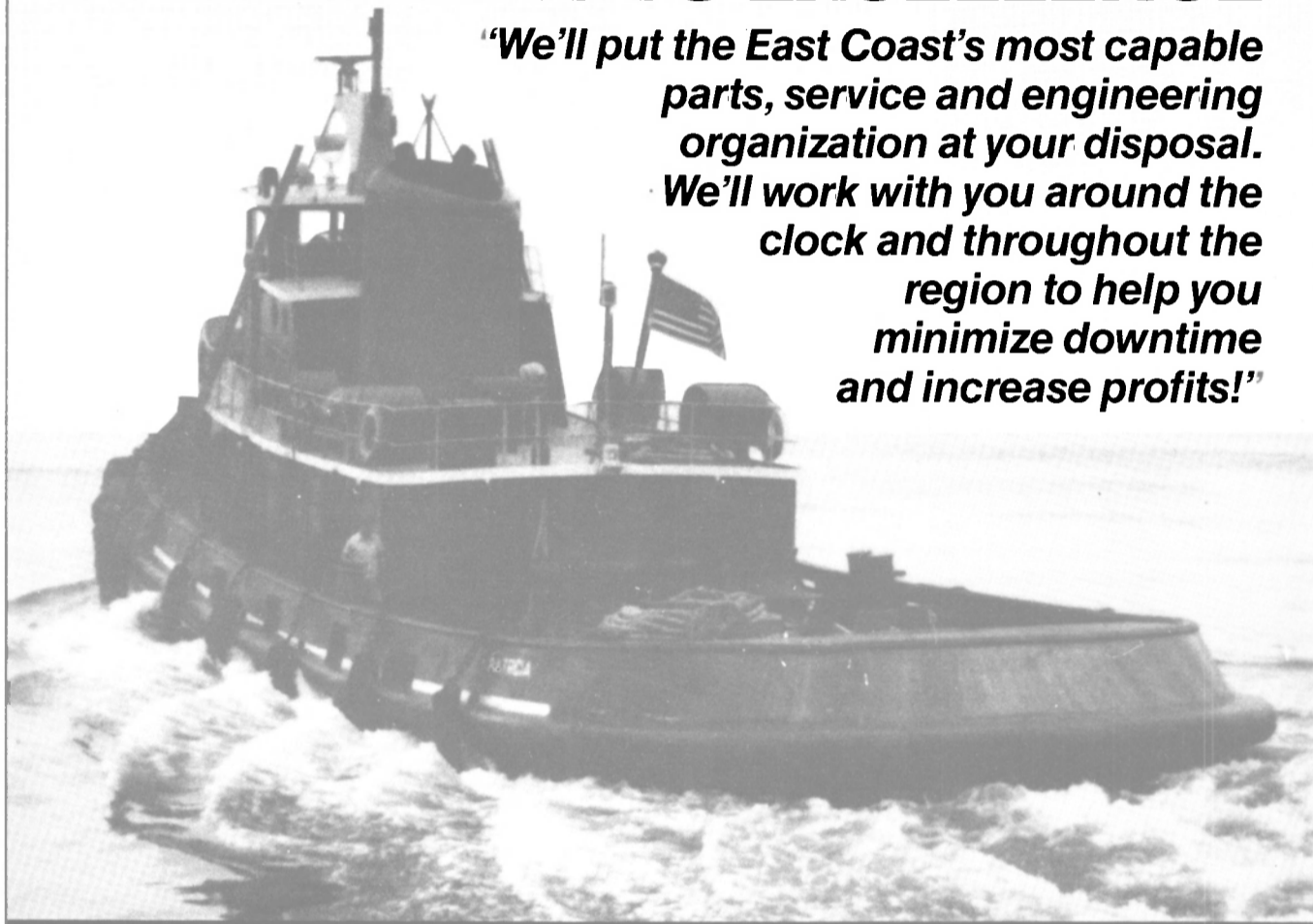
aged seawater conversion equipment, MECO can fill your needs for fresh water on the high seas. If you'd like to know more about our new line of marine products, call or write MECO, Mechanical Equipment Company, Inc., 861 Carondelet Street, New Orleans, LA 70130. Phone (504) 523-7271. Telex: 058-377 or 460165. Cable MECO.

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Ronkonkoma, N.Y. 11779
516-981-5800

Navy Overhaul

(continued from page 20)

Todd

The firm has announced it will seek an acquisition outside the marine field. It wishes to diversify—not be dependent on the ship repair and Navy construction business. “This is a high priority objective of the company.”

Southwest Marine

A new floating drydock has been delivered. The dock, built by Kawasaki, is designed as part of a system for lifting ships up to 10,000 tons and transferring them to two land platforms. See July report, p. 28 for schematic of yard layout. See also, MARITIME REPORTER issue of August 15, 1984.

Pennship

A newly formed investor group in Mobile, Alabama is reported to have acquired substantial interest in Paden Inc., the parent company of Pennship. The investor group is headed by Tom Weller, long active in developing industrial real estate. The Pennship yard occupies 180 acres along the Delaware River.

In September Pennship was awarded a \$21 million CPFF contract for phased maintenance of the frigate Patterson (FF-1061).

Continental Maritime of San Francisco Inc.

The firm (formerly San Francisco Welding) has ordered a new floating drydock from GHH Sterkrade. The dock will be 664' long, 142' clear width between wingwalls, and 34' 6" water clearance over keel blocks. Its displacement is 25,000 tons. The new dock will be able to lift CG-47 class cruisers and is planned to be in service 31 May 1985. The dock will be delivered on a heavy lift ship by way of Cape Horn.

In late September Continental Maritime was awarded a \$18.0 million contract by the Maritime Administration to convert the President Monroe to an auxiliary crane ship (T-ACS).

Boston Shipyard Corporation

The firm had received a \$8.5 million contract to overhaul the frigate Connole (FF-1056). This ship overhaul was one of four FF-1052 class frigates originally to be a single package overhaul bid in 1982. Just prior to the bid submission date (10 September 1982) Navy reduced the bid package to two ships and set aside two ships for small business participation. Boston Shipbuilding and General Ship, both small businesses, were each awarded one fri-

gate overhaul. Bath won the two ship package.

Work began on the Connole in

mid-September. Within two weeks Navy advised Boston Shipyard it was dissatisfied with the quality and

speed of work. Navy then terminated the contract. The yard initially refused to allow the ship to be



**Without efficient, dependable pumps,
even their awesome weaponry
can't assure them
mastery of the seas.**

moved. Management is reported to have stated Navy's actions would force the shipyard to close, throwing

500 employees out of work. It is reported that on 29 September 50 workers occupied the frigate, the

yard gates were locked, and cranes were placed behind the masts to prevent the ship being moved.

On 2 October Navy moved the ship to a neutral pier. Navy is now studying options on how to complete the overhaul.

Boston Shipyard in late September was also awarded a \$5.6 million fixed price contract to overhaul an auxiliary floating drydock (ARD-5).

Coastal Dry Dock

In mid-August the firm was awarded a \$8.0 million fixed price contract to overhaul the frigate W. S. Sims (FF-1059).

Service Engineering Company

In late June the firm received a \$7.7 million fixed price contract to overhaul the ammunition ship Hal-eakala (AE-25).

Master Ordnance Repair (MOR) Contractors

Three additional firms have been qualified as master ordnance repair contractors: VSE, Norshipco, and NASSCO. This brings the total number of contract holders to eleven. (See pp. 87-88 of July IMA report for MOR details).

MSC Overhauls

Exhibit 2 lists MSC ship overhauls and major repairs contracted since last June.

Navy Overhauls and Restricted Availabilities

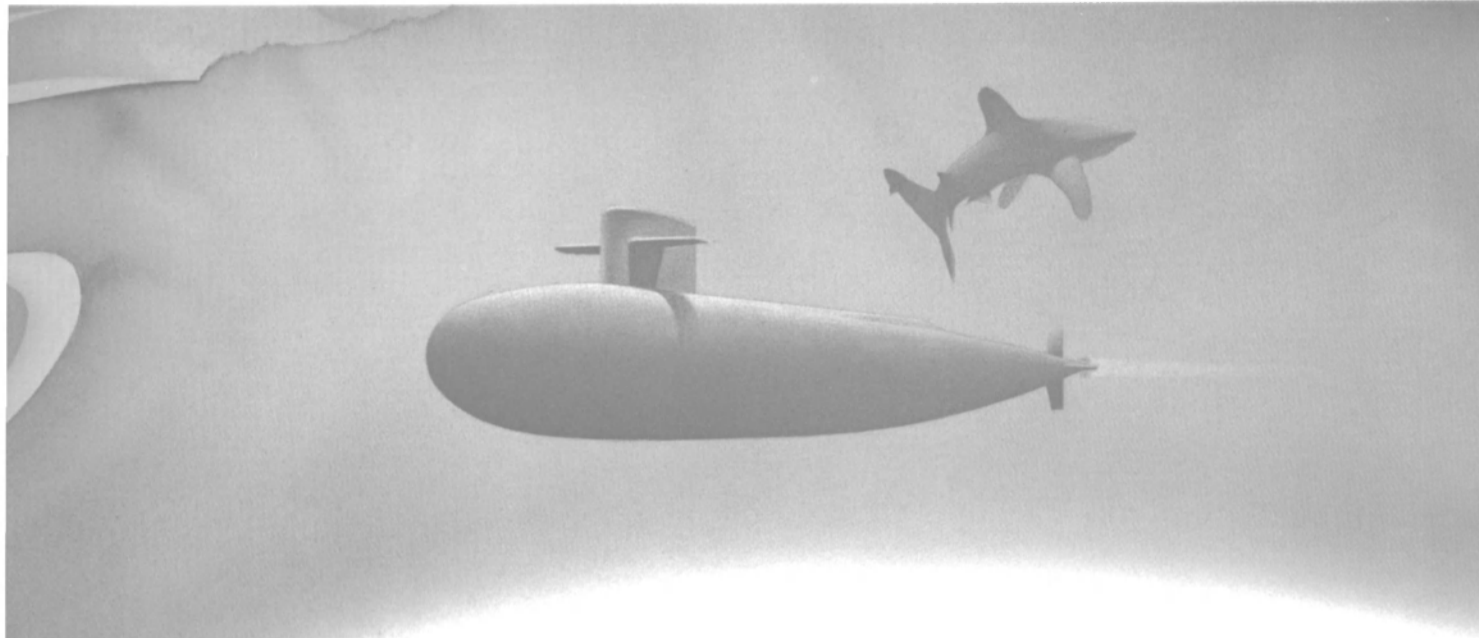
Navy overhaul and restricted availability contract awards by shipyard since 1982 are shown in Exhibit 3. A revised listing of contract awards will be included in each update to our subscribers.

3. CHANGES IN PROJECTED MARKET

Exhibit 4 provides the FY 84-85 surface ship overhaul and restricted availability plan. Asterisks indicate work packages where changes have been announced since the July IMA report.

Navy plans to issue a new FY 85-86 private sector overhaul plan in November. The next MARITIME REPORTER article and the next IMA quarterly update will report its contents.

Exhibit 5 shows the MSC nucleus fleet overhaul schedule as of September 1984. Asterisks indicate where changes have occurred since the July report. Each quarterly update to our subscribers will report changes which occur.



An undersea survival machine so efficient, its basic form hasn't changed for over 60 million years.

Powerful, tireless, capable of swimming at speeds up to 30 miles an hour. At home in the shallows as well as in depths to 12,000 feet.

A sensory system that can smell infinitesimal traces of blood—and detect the thrashing of a wounded fish hundreds of yards away.

It is called shark, and it has no fear. Because it has few enemies, save others of its kind.

The enormous amounts of oxygen required to fuel this powerful machine are supplied through one of nature's most remarkable pumps. Because sea water carries only 3/100ths as much free oxygen as air, the shark's respiratory pump must move tremendous volumes. Yet the water it pumps is 800 times denser than air.

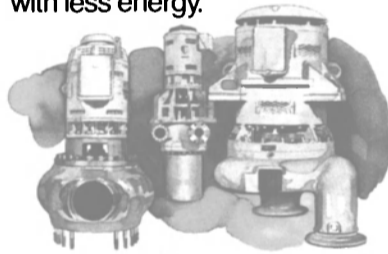
Controlling fluids is vital to the

survival of a modern submarine as well. Its pumps must be designed and constructed so they operate not only efficiently, but silently. For its survival depends, in part, on detecting others while remaining undetected.

The unique ways in which Ingersoll-Rand met the noise and reliability standards set by the U.S. Navy are the major reasons it was chosen as pump supplier for the Trident nuclear submarines.

For example, there is considerable potential for noise in the conventional, high-speed single impeller. Ingersoll-Rand engineers substituted a staged series of small impellers that deliver the required flow while keeping rotation speed and fluid velocity low. And, inside the hydraulic passageways, virtually all noise-causing turbulence was eliminated by refining impeller vane geometry and spacing.

Our research goes on, to build more efficient pumps for both military and industrial uses. By fighting corrosion, by adding longer life and cutting maintenance, by moving greater volumes at higher speeds with less energy.



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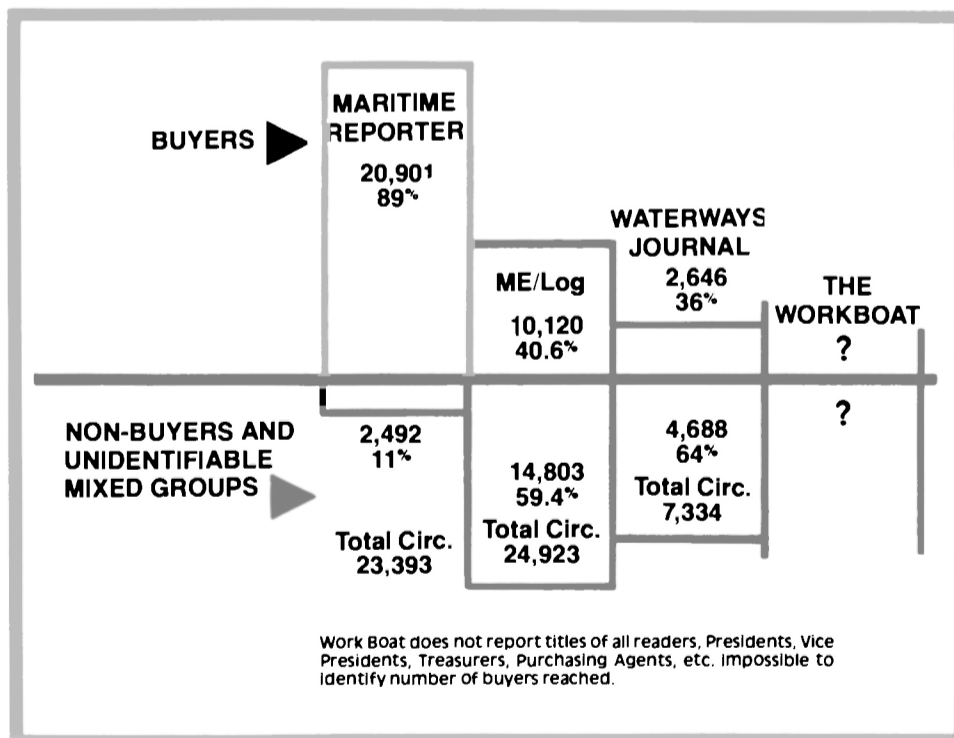
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in 1984, MARITIME REPORTER's total circulation increased by thousands to a record 23,323 copies every issue.

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Now, MARITIME REPORTER delivers your advertising to 20,901 identifiable buyers...over twice the number 2 magazine.



THE BEST ADVERTISER

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Paints/Corrosion Control	756
	657
	655
Shipbuilding/Repair	2,147
	613
	547
Deck Machinery/Cargo Handling	523
	419
	395

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ISING RESULTS

e and better sales leads than any
and three times more than the
ted represents inquiries produced
TIME REPORTER in one year or less.

THE ADVERTISING LEADER

In 1983, and for years, more media buyers placed more pages of advertising, for a larger number of advertisers, in MR than in No. 2, ME/Log.

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1,168
1,153
1,123

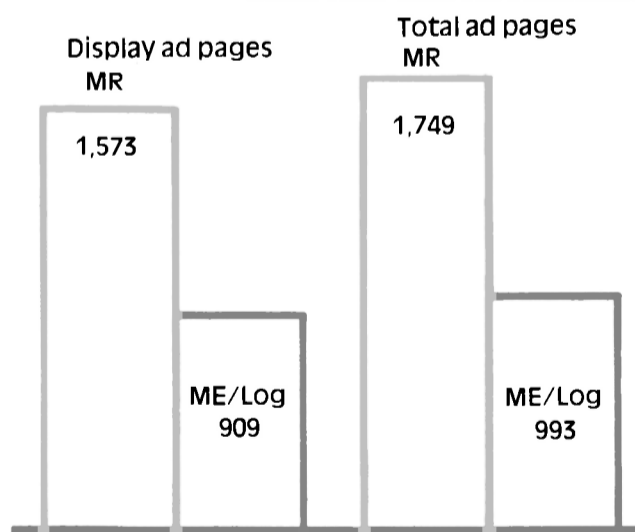
igation & Communications

663
621
590

Oily Water Separators

756
459
360

COMPARE 1983 ADVERTISING



Note — shows only magazine advertising
13 ME/Log issues —
24 MR issues . . .
no catalogs, buyers
guides, etc.
Ad pages reported
in 7" x 10" units
for comparison.

And in the first 6 months of 1984, MARITIME REPORTER carried more pages of advertising than No. 2, ME/Log.

MR clearly leads by a wide margin in advertiser acceptance.

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November 15, 1984

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REPORTER**
AND
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Navy Overhaul — Update



Exhibit 4
Navy Ship Restricted Availability and Overhaul Plan
 * Indicates changes since June 1984

Ship	Type Work	Scheduled Dates		Bidding Area	Procurement Method	Type Contract	Procurement Contracting Office		Notes
		Start	Complete						
Newport, RI									
FF 1091	SRA	10/07/83	01/24/84	HPA	NSS	CPAF	SEA 02	PM	awarded General Ship
FF 1091	DSRA	03/04/85	07/03/85	HPA	NSS	CPAF	SEA 02	PM	awarded General Ship
FF 1096	DSRA	04/02/84	08/10/84	HPA	NSS	CPAF	SEA 02	PM	awarded General Ship
FF 1096	SRA	08/01/85	11/15/85	HPA	RFP-2P	CPAF	SEA 02	PM	awarded General Ship
* DD 946	NRT	10/15/84	06/15/85	HPA	IFB	FFP	SBOST		awarded General Ship
* FF 1056	ROH	09/11/84	05/10/85	CWA	RFP-2P	FFP	SEA 02		SBA awarded Boston Ship
New London, CT									
* ARDM 4	ROH	06/15/85	12/15/85	HPA	IFB	FFP	SBOST		
* ARD 5	ROH	09/10/84	03/11/85	HPA	IFB	FFP	SGROT		awarded Boston Ship
Earle, NJ									
* AE 21	ROH	01/07/85	10/07/85	HPA	RFP-1P	FFP	SBKYN		
AE 27	ROH	06/15/85	03/15/86	CWA	RFP-1P	FFP	SSF		
Philadelphia, PA									
* FF 1061	SRA	09/24/84	12/20/84	HPA	NSS	CPAF	SBKYN	PM	
* FF 1061	SRA	01/06/86	04/20/86	HPA	NSS	CPAF	SEA 02	PM	
* FF 1061	SRA	04/07/87	07/30/87	HPA	NSS	CPAF	SEA 02	PM	
* FF 1061	DSRA	07/14/88	11/13/88	HPA	NSS	CPAF	SEA 02	PM	
Norfolk, VA									
* MSO 446	NRT	05/15/84	09/14/84	HPA	IFB	FFP	SPORT		awarded Colonna
LSD 37	ROH	01/15/85	09/15/85	HPA	IFB	FFP	SPORT		
LST 1181	ROH	04/01/85	11/01/85	HPA	IFB	FFP	SPORT		
* ARD 7	ROH								deleted
* LKA 117	ROH	07/17/84	12/14/84	HPA	NSS	CPAF	SPORT		awarded Metro
* LPD 12	ROH								changed to FY 86
* LPD 14	ROH	06/01/84	02/14/85	HPA	IFB	FFP	SPORT		awarded Metro
FF 1097	SRA	03/05/84	05/25/84	HPA	IFB	FFP	SPORT		awarded Metro Machine
FF 1084	SRA	08/28/85	11/15/85	HPA	IFB	FFP	SPORT		
* FF 1092	ROH	08/15/84	04/15/85	HPA	RFP-2P	FFP	SEA 02		awarded Jonathon
DDG 46	SRA	10/19/83	02/02/84	HPA	IFB	FFP	SPORT		awarded Norshipco
* DDG 993	SRA	06/04/84	07/18/84	HPA	RFP-1P	FFP	SPORT		awarded Norshipco
* DDG 995	SRA	02/13/84	03/26/84	HPA	IFB	FFP	SPORT		awarded Norshipco
DDG 995	SRA	05/01/85	06/30/85	HPA	RFP-1P	FFP	SPORT		awarded Norshipco
CG 26	SRA	03/15/84	05/15/84	HPA	IFB	FFP	SPORT		awarded Norshipco
CG 34	SRA	10/17/83	01/04/84	HPA	IFB	FFP	SPORT		awarded Norshipco
CG 47	SRA	10/05/84	12/05/84	HPA	RFP-1P	FFP	SPORT		
DD 968	SRA	02/14/84	04/27/84	HPA	IFB	FFP	SPORT		awarded Metro Machine
* DD 969	SRA	01/30/85	04/09/85	HPA	NSS	CPAF	SEA 02	MS	
* DD 970	SRA	08/21/84	10/26/84	HPA	IFB	FFP	SPORT		awarded Norshipco
* DD 977	SRA	04/01/85	06/22/85	HPA	NSS	CPAF	SEA 02	MS	
* AFS 2	SRA	08/15/84	11/16/84	HPA	NSS	CPAF	SEA 02	PM	awarded Jonathon
AFS 5	DSRA	01/23/84	05/18/84	HPA	NSS	CPAF	SEA 02	PM	awarded Jonathon
AFS 5	SRA	08/01/85	11/01/85	HPA	NSS	CPAF	SEA 02	PM	awarded Jonathon
AFS 6	DSRA	11/26/84	03/22/85	HPA	NSS	CPAF	SEA 02	PM	awarded Jonathon
* AO 178	SRA	09/03/84	12/07/84	HPA	NSS	CPAF	SEA 02	PM	SBA awarded Norshipco
* AO 179	SRA	06/04/84	09/10/84	HPA	NSS	CPAF	SEA 02	PM	SBA awarded Norshipco
* AO 186	SRA	07/07/85	10/11/85	HPA	NSS	CPAF	SEA 02	PM	SBA award Norshipco
* AOE 3	DSRA	01/14/85	05/10/85	HPA	NSS	CPAF	SEA 02	PM	
* AOR 2	DSRA	05/14/84	09/14/84	HPA	NSS	CPAF	SEA 02	PM	SBA awarded Jonathon
* AOR 2	SRA	06/16/85	09/16/85	HPA	NSS	CPAF	SEA 02	PM	SBA awarded Jonathon
* AOR 4	SRA	10/17/83	02/01/84	HPA	NSS	CPAF	SEA 02	PM	SBA awarded Jonathon
* AD 41	DSRA	01/07/85	05/06/85	HPA	IFB	FFP	SPORT		
FF 1085	ROH	11/15/83	07/15/84	ESA	NSS	CPAF	SEA 02	MS	awarded Coastal
FF 1094	ROH	03/15/84	11/15/84	ESA	NSS	CPAF	SEA 02	MS	awarded Coastal
* LST 1180	ROH	06/18/84	12/21/84	CWA	IFB	FFP	SPORT		SBA awarded Detyens
LPD 1	ROH	02/15/85	11/15/85	CWA	IFB	FFP	SPORT		
FF 1097	ROH	11/15/85	07/15/86	CWA	NSS	CPAF	SEA 02	MS	
* FFG 5	ROH	09/26/84	09/26/85	CWA	RFP-2P	FFP	SEA 02		awarded Bath
FF 1095	ROH	05/05/85	01/15/86	CWA	NSS	CPAF	SEA 02	MS	
* DDG 46	ROH	03/27/85	02/27/86	CWA	NSS	CPAF	SEA 02		
FF 1038	ROH	06/28/85	02/28/86	CWA	IFB	FFP	SJACK		
DD 974	ROH	10/07/83	09/07/84	CWA	NSS	CPAF	SEA 02	MS	awarded Ingalls
DD 979	ROH	02/15/84	01/15/85	CWA	NSS	CPAF	SEA 02	MS	awarded Bath
* AO 99	ROH	09/18/84	05/03/85	CWA	IFB	FFP	SSF		SBA awarded Hoboken
Charleston, SC									
* FF 1072	SRA	01/05/85	04/05/85	HPA	NSS	CPAF	SEA 02	PM	
* FF 1072	SRA	05/06/86	08/06/86	HPA	NSS	CPAF	SEA 02	PM	
* FF 1072	SRA	09/01/87	12/20/87	HPA	NSS	CPAF	SEA 02	PM	
* MSO 448	ROH	01/16/84	05/14/84	HPA	IFB	FFP	SCHAS		awarded Detyens
* MSO 442	NRT	09/28/84	02/15/85	HPA	IFB	FFP	SCHAS		awarded Detyens
FF 1075	SRA	01/10/84	03/10/84	HPA	IFB	FFP	SCHAS		awarded Swygert
FF 1078	SRA	01/21/84	03/22/84	HPA	IFB	FFP	SCHAS		awarded Braswell
* FF 1079	SRA	06/25/84	09/15/84	HPA	IFB	FFP	SCHAS		awarded Metal Trades
FF 1044	SRA	04/01/85	06/01/85	HPA	IFB	FFP	SCHAS		
* FF 1040	SRA	09/10/84	11/01/84	HPA	IFB	FFP	SCHAS		awarded Braswell
DDG 11	SRA	03/26/85	05/24/85	HPA	IFB	FFP	SCHAS		
DDG 18	SRA	03/05/85	05/03/85	HPA	IFB	FFP	SCHAS		
DD 981	SRA	09/30/85	11/30/85	HPA	IFB	FFP	SCHAS		
AE 28	DSRA	06/10/85	10/08/85	HPA	NSS	CPAF	SEA 02	PM	
* AD 18	DSRA	04/15/84	08/14/85	HPA	IFB	FFP	SCHAS		
FF 1089	ROH	02/21/84	10/13/84	CWA	RFP-2P	FFP	SEA 02		SBA awarded General Ship
DD 980	ROH	10/07/84	08/07/85	CWA	NSS	CPAF	SEA 02	MS	awarded Coastal
DD 982	ROH	05/07/84	02/15/85	CWA	NSS	CPAF	SEA 02	MS	awarded Coastal
DD 983	ROH	06/10/84	05/10/85	CWA	NSS	CPAF	SEA 02	MS	awarded Ingalls
DD 987	ROH	08/31/84	06/30/85	CWA	NSS	CPAF	SEA 02	MS	awarded Bath
DD 988	ROH	02/15/85	12/15/85	CWA	NSS	CPAF	SEA 02	MS	awarded Ingalls
DD 989	ROH	02/15/85	02/15/86	CWA	NSS	CPAF	SEA 02	MS	awarded Bath
Kings Bay, GA									
ARDM 1	ROH	01/03/85	07/01/85	CWA	IFB	FFP	SCHAS		
AS 33	ROH	06/01/85	04/01/86	CWA	RFP-2P	FFP	SEA 02		
Mayport, FL									
FG 11	DSRA	02/04/85	06/13/85	HPA	RFP-1P	FFP	SJACK		
FG 13	DSRA	04/15/85	08/14/85	HPA	RFP-1P	FFP	SJACK		
FFG 16	SRA	03/18/84	07/14/84	HPA	RFP-1P	FFP	SJACK		awarded Jacksonville
* FFG 20	SRA	08/20/84	10/20/84	HPA	RFP-1P	FFP	SJACK		awarded Atlantic
* FFG 21	SRA	05/01/84	06/15/84	HPA	RFP-1P	FFP	SJACK		awarded Atlantic
FFG 22	SRA	10/07/84	12/21/84	HPA	RFP-1P	FFP	SJACK		
* FFG 24	SRA	07/01/84	09/01/84	HPA	RFP-1P	FFP	SJACK		awarded Atlantic
FFG 26	SRA	10/08/84	12/14/84	HPA	RFP-1P	FFP	SJACK		
FFG 28	SRA	03/01/85	05/17/85	HPA	RFP-1P	FFP	SJACK		

Ship	Type Work	Scheduled Dates		Bidding Area	Procurement Method	Type Contract	Procurement Contracting Office	Notes
		Start	Complete					
FFG 29	SRA	01/07/85	03/22/85	HPA	RFP-1P	FFP	SJACK	
FFG 32	SRA	06/13/85	08/19/85	HPA	RFP-1P	FFP	SJACK	
FFG 34	SRA	09/25/85	11/29/85	HPA	RFP-1P	FFP	SJACK	
* MSO 441	NRT	08/01/84	11/01/84	HPA	RFP-1P	FFP	SJACK	awarded Jacksonville
FFG 4	SRA	09/10/85	11/10/85	HPA	RFP-1P	FFP	SJACK	
FF 1068	SRA	01/10/85	03/15/85	HPA	RFP-1P	FFP	SJACK	
* FF 1080	SRA	06/08/84	08/23/84	HPA	RFP-1P	FFP	SJACK	awarded Atlantic
FF1047	SRA	07/10/85	09/10/85	HPA	RFP-1P	FFP	SJACK	
FF 1043	SRA	01/10/84	03/01/84	HPA	RFP-1P	FFP	SJACK	awarded Atlantic
FF 1043	SRA	07/08/85	09/09/85	HPA	RFP-1P	FFP	SJACK	
* DDG 19	SRA	07/16/84	09/14/84	HPA	RFP-1P	FFP	SJACK	awarded Jacksonville
DDG 38	SRA	02/27/85	06/26/85	HPA	RFP-1P	FFP	SJACK	
DDG 10	SRA	01/12/84	03/12/84	HPA	RFP-1P	FFP	SJACK	awarded Jacksonville
DDG 10	SRA	08/28/85	10/28/85	HPA	RFP-1P	FFP	SJACK	
CG 19	SRA	10/17/83	12/16/83	HPA	RFP-1P	FFP	SJACK	awarded Atlantic
CG 19	SRA	03/11/85	07/10/85	HPA	RFP-1P	FFP	SJACK	
CV 60	SRA	11/12/84	03/10/85	HPA	RFP-1P	FFP	SJACK	
* FF 1059	ROH	09/18/84	05/17/85	CWA	RFP-2P	FFP	SEA 02	SBA awarded Coastal
Panama City, FL								
* MSO 443	ROH	01/15/85	04/30/85	HPA	RFP-1P	FFP	SJACK	
Pensacola, FL								
* AVT 16	SRA	10/07/83	12/11/83	HPA	RFP-2P	FFP	SEA 02	awarded ADSCO
Guantanamo Bay, Cuba								
AFDL 1 ROH	07/10/85	11/08/85	HPA	RFP-1P	FFP	SJACK		
Alameda, CA								
CVN 65	SRA	01/07/85	04/04/85	HPA	RFP-1P	CPAF	SSF	MS
CVN 70	SRA	11/30/83	02/12/84	HPA	RFP-1P	FFP	SSF	MS
CVN 70	SRA	05/25/85	09/08/85	HPA	RFP-1P	CPAF	SSF	MS
AOR 1	DSRA	05/21/84	09/17/84	HPA	NSS	CPAF	SEA 02	PM
AD 37	DSRA	03/25/85	06/14/85	HPA	IFB	FFP	SSF	SBA awarded Southwest
Concord, CA								
* AE 25	ROH	06/28/84	04/30/85	HPA	RFP-1P	FFP	SSF	awarded Service Engineering
AE 29	ROH	07/22/85	04/25/86	HPA	IFB	FFP	SSF	
AE 35	SRA	07/29/85	11/01/85	HPA	NSS	CPAF	SEA 02	PM
Long Beach, CA								
LST 1191	SRA	04/01/85	05/31/85	HPA	NSS	CPAF	SEA 02	PM
LSD 39	ROH	07/22/85	03/21/86	HPA	RFP-1P	FFP	SLB	
FFG 10	DSRA	09/09/85	01/03/86	HPA	NSS	COST	SEA 02	
* FF 1060	SRA	03/04/85	06/07/85	HPA	IFB	FFP	SLB	PM
* DD 964	SRA	06/03/85	08/26/85	HPA	RFP-1P	FFP	SLB	
AOR 5	SRA	11/19/84	02/15/85	HPA	NSS	CPAF	SEA 02	PM SBA awarded Southwest
AOR 7	SRA	05/27/85	08/23/85	HPA	NSS	CPAF	SEA 02	PM SBA award Southwest
San Diego, CA								
* MSO 464	NRT	05/06/85	10/04/85	HPA	IFB	FFP	SSD	
* MSO 464	DSRA							changed to FY 87
LST 1195	SRA	03/04/85	05/03/85	HPA	NSS	CPAF	SEA 02	PM
* MSO 427	DSRA	02/06/84	03/16/84	HPA	IFB	FFP	SSD	awarded Campbell
* MSO 427	DSRA	02/06/85	03/16/85	HPA	IFB	FFP	SSD	

(Exhibit 4 continued on page 28)

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Navy Overhaul — Update



(Exhibit 4 continued from page 27)

Ship	Type Work	Scheduled Dates		Bidding Area	Procurement Method	Type Contract	Procurement Contracting		Notes
		Start	Complete				Office		
LST 1187	SRA	07/29/85	09/27/85	HPA	NSS	CPAF	SEA 02	PM	
* LST 1189	ROH	09/17/84	05/03/85	CWA	IFB	FFP	SPORT	PM	SBA awarded RMI
FFG 14	SRA	01/09/84	05/04/84	HPA	NSS	COST	SEA 02	MS	awarded Southwest
* FFG 19	SRA	06/11/84	08/16/84	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD I & S
* FFG 23	SRA	01/07/85	03/15/85	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD I & S
* FFG 25	SRA	02/04/85	04/05/85	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD I & S
* FFG 27	SRA	06/17/85	08/16/85	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD I & S
LHA 1	SRA	01/09/84	04/08/84	HPA	IFB	FFP	SSD		awarded Arcwel
* LHA 1	SRA	06/17/85	10/15/85	HPA	IFB	FFP	SSD		
LPH 10	ROH	08/05/85	06/06/86	HPA	RFP-2P	FFP	SEA 02		
FF 1063	SRA	01/07/85	03/08/85	HPA	NSS	CPFF	SEA 02	MS	
FF 1065	SRA	01/07/85	03/15/85	HPA	NSS	CPFF	SEA 02	MS	awarded Southwest
* FF 1069	ROH	05/14/84	01/11/85	HPA	RFP-2P	FFP	SEA 02		awarded Triple A SD
FF 1070	SRA	07/22/85	09/13/85	HPA	NSS	CPFF	SEA 02	MS	
FF 1076	SRA	11/22/85	01/31/86	HPA	NSS	CPFF	SEA 02	MS	
FFG 1	SRA	02/20/84	04/13/84	HPA	NSS	CPFF	SEA 02	MS	awarded SD 1 & S
FFG 3	SRA	07/30/84	09/28/84	HPA	NSS	CPFF	SEA 02	MS	awarded SD 1 & S
DD 965	SRA	03/04/85	05/03/85	HPA	NSS	CPFF	SEA 02	MS	
DD 966	SRA	01/03/84	02/24/84	HPA	NSS	CPFF	SEA 02	MS	awarded Southwest
* DD 966	SRA	07/22/85	09/30/85	HPA	NSS	CPFF	SEA 02	MS	
DD 967	SRA	02/06/84	04/20/84	HPA	NSS	CPFF	SEA 02	MS	awarded Southwest
DD 967	SRA	12/02/85	02/24/86	HPA	NSS	CPFF	SEA 02	MS	
DD 971	SRA	07/23/84	09/14/84	HPA	NSS	CPFF	SEA 02	MS	awarded Southwest
* DD 971	SRA	03/24/86	06/23/86	HPA	NSS	CPFF	SEA 02	MS	
* DD 972	SRA								assigned to public sector
* DD 973	SRA	07/29/85	10/07/85	HPA	NSS	CPFF	SEA 02	MS	
* DD 975	SRA	01/07/85	03/25/85	HPA	NSS	CPFF	SEA 02	MS	
DD 975	SRA	06/30/86	08/23/86	HPA	NSS	CPFF	SEA 02	MS	
* DD 976	ROH	03/04/85	11/08/85	CWA	FSS	CPAF	SEA 02	MS	
* DD 985	ROH	05/06/85	04/11/86	CWA	FSS	CPAF	SEA 02	MS	
* DD 991	ROH	01/06/86	01/09/87	CWA	FSS	CPAF	SEA 02	MS	
* DD 992	ROH	10/28/85	10/10/86	CWA	FSS	CPAF	SEA 02	MS	
* DDG 7	SRA	01/07/85	03/01/85	HPA	NSS	CPDD	SEA 02	MS	SBA awarded SD 1 & S
* DDG 8	SRA	04/09/84	06/15/84	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD 1 & S
* DDG 12	SRA	12/12/83	02/24/84	HPA	IFB	FFP	SSD		awarded Southwest
* DDG 12	SRA	05/27/85	07/19/85	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD 1 & S
DDG 14	SRA	12/12/83	02/24/84	HPA	IFB	FFP	SSD		awarded A & E Ind.
* DDG 15	SRA	12/03/84	01/25/85	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD 1 & S
DDG 994	SRA	03/12/84	05/11/84	HPA	IFB	FFP	SSD		awarded A&E Ind.
DDG 996	SRA	11/19/84	01/18/85	HPA	IFB	FFP	SSD		
FF 1037	SRA	07/30/84	09/28/84	HPA	NSS	CPFF	SEA 02	MS	awarded Southwest
* FF 1050	SRA	07/30/84	09/28/84	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD 1 & S
* FF 1051	SRA	01/07/85	03/01/85	HPA	NSS	CPFF	SEA 02	MS	SBA awarded SD 1 & S
FF 1053	SRA	01/09/84	03/02/84	HPA	NSS	CPFF	SEA 02	MS	awarded Southwest
AS 37	ROH	01/16/84	11/16/84	HPA	IFB	FFP	SSD		awarded Triple A SD
AS 41	SRA	09/15/85	11/15/85	HPA	IFB	FFP	SSD		
ASR 9	ROH	08/30/85	01/30/86	HPA	RFP-1P	FFP	SSD		
CG 16	SRA	12/12/83	03/09/84	HPA	NSS	CPFF	SEA 02	MS	awarded NASSCO
CG 16	SRA	07/22/85	09/20/85	HPA	NSS	CPFF	SEA 02	MS	
CG 21	SRA	07/22/85	09/20/85	HPA	NSS	CPFF	SEA 02	MS	
* CG 22	SRA	07/09/84	09/14/84	HPA	NSS	CPFF	SEA 02	MS	awarded NASSCO
* CG 23	DSRA	01/07/85	03/15/85	HPA	NSS	CPFF	SEA 02	MS	
CG 29	SRA	03/04/85	05/03/85	HPA	NSS	CPFF	SEA 02	MS	
CG 30	SRA	05/28/84	07/20/84	HPA	NSS	CPFF	SEA 02	MS	awarded NASSCO
CG 30	SRA	11/18/85	01/24/86	HPA	NSS	CPFF	SEA 02	MS	
CG 32	SRA	05/17/85	08/09/85	HPA	NSS	CPFF	SEA 02	MS	
CG 33	SRA	11/25/85	01/31/86	HPA	NSS	CPFF	SEA 02	MS	
CV 63	SRA	10/02/84	01/11/85	HPA	IFB	FFP	SSD		
AD 42	DSRA	08/05/85	11/08/85	HPA	RFP-1P	FFP	SSD		
LST 1198	ROH	01/07/85	08/23/85	ESA	NSS	CPFF	SEA 02	MS	awarded NASSCO
LST 1183	ROH	07/23/84	03/08/85	ESA	NSS	CPFF	SEA 02	MS	awarded NASSCO
LST 1184	ROH	02/20/84	10/05/84	ESA	NSS	CPFF	SEA 02	MS	awarded NASSCO
* LST 1185	ROH	02/04/85	09/20/85	CWA	IFB	FFP	SPORT	PM	
* LST 1182	ROH	01/09/84	08/24/84	CWA	IFB	FFP	SPORT		SBA awarded SD 1 & S
* IX 501	ROH	09/24/84	05/24/85	CWA	IFB	FFP	SSD		awarded Triple A South changed to FY 86
* LPD 6	ROH								
* LPD 9	ROH	02/18/85	11/15/85	HPA	NSS	FFP	SSD		
FF 1083	ROH	01/09/84	09/07/84	CWA	IFB	CPFF	SEA 02	MS	awarded NASSCO
DD 986	ROH	11/26/84	07/26/85	CWA	NSS	CPAF	SEA 02		
FF 1053	ROH	07/29/85	03/28/86	CWA	RFP-2P	FFP	SEA 02		SBA
ARD 30	ROH	09/01/85	03/01/86	CWA	IFB	FFP	SSD		
Oakland, CA									
AFS 1	SRA	08/20/84	12/21/84	HPA	NSS	CPAF	SEA 02	PM	awarded Todd/S.F.
San Francisco, CA									
* MSO 489	DSRA	03/19/84	04/20/84	HPA	IFB	FFP	SSF		awarded Pacific
MSO 489	DSRA	04/15/85	05/24/85	HPA	IFB	FFP	SSF		
* MSO 439	DSRA	01/07/85	02/15/85	HPA	IFB	FFP	SSF		
* MSO 439	DSRA								changed to FY 86
* AOR 3	DSRA	01/16/84	05/14/84	HPA	NSS	CPAF	SEA 02	PM	SBA awarded Southwest
Seattle, WA									
* MSO 488	DSRA	02/27/84	04/10/84	HPA	IFB	FFP	SSEAT		awarded Lake Union
MSO 488	DSRA	02/11/85	03/22/85	HPA	IFB	FFP	SSEAT		
* MSO 492	DSRA	11/07/83	12/23/83	HPA	IFB	FFP	SSEAT		awarded Lake Union
MSO 492	DSRA	10/01/84	11/09/84	HPA	IFB	FFP	SSEAT		
MSO 438	DSRA	10/17/83	12/09/83	HPA	IFB	FFP	SSEAT		awarded Lake Union
* MSO 438	NRT	09/28/84	02/15/85	HPA	IFB	FFP	SSEAT		
Tacoma, WA									
* MSO 437	DSRA	02/12/85	03/23/85	HPA	IFB	FFP	SSEAT		
* MSO 437	DSRA	11/05/84	12/14/84	HPA	IFB	FFP	SSEAT		awarded Lake Union
* MSO 455	DSRA	08/13/84	09/21/84	HPA	IFB	FFP	SSEAT		awarded Lake Union
* MSO 455	NRT	09/09/85	02/07/86	HPA	IFB	FFP	SSEAT		

Source: NAVSEA

LEGEND:	CPAF = Cost Plus Award Fee;	MS = Multiship;	SEA 02 = Naval Sea Systems Command 02;
CPFF = Cost Plus Fixed Fee;	CWA = Coastwise Area;	NRT = Naval Reserve Training Ship Overhaul;	SBKYN = SUPSHIP (Brooklyn);
DSRA = Drydocking Selected Restricted Availability;	ESA = Extended Solicitation Area;	NSS = Negotiated Source Selection;	SBOST = SUPSHIP (Boston);
FFP = Firm Fixed Price;	HPA = Homeport Area;	PM = Phased Maintenance;	SCHAS = SUPSHIP (Charleston);
IFB = Invitation For Bid;	ROH = Regular Overhaul;	RFP = Request for Proposal;	SJACK = SUPSHIP (Jacksonville);
		RFP/IP = Request for Proposal/One Phase;	SPORT = SUPSHIP (Portsmouth);
		RFP/2P = Request For Proposal/Two Phase;	SSD = SUPSHIP (San Diego);
		SBA = Small Business Set Aside;	SSEAT = SUPSHIP (Seattle);
		SRA = Selected Restricted Availability;	SSF = SUPSHIP (San Francisco);

Exhibit 5

MSC Nucleus Fleet Overhaul Schedule (as of 1 September 1984)
 * Indicates changes since June 1984

Name	Type	Type of Work	Scheduled Work Start	Name	Type	Type of Work	Scheduled Work Start
ATLANTIC FLEET							
* NEPTUNE	TARC-2	BIENNIAL OVERHAUL	NOV 84	* MISPELLION	TAO-105	BIENNIAL OVERHAUL	AUG 85
MOHAWK	TATF-170	BIENNIAL OVERHAUL	MAR 85	* PASSUMPSIC	TAO-107	BIENNIAL OVERHAUL	JUL 85
PAWCATUCK	TAO-108	BIENNIAL OVERHAUL	SEPT 84	* HASSAYAMPA	TAO-145	BIENNIAL OVERHAUL	AUG 85
* WACCAMAW	TAO-109	BIENNIAL OVERHAUL	JUL 85	* KAWISHIWI	TAO-146	BIENNIAL OVERHAUL	MAY 85
MISSISSINAWA	TAO-144	BIENNIAL OVERHAUL	FEB. 85	* NARRAGANSETT	TATF-167	BIENNIAL OVERHAUL	APR 85
TRUCKEE	TAO-147	BIENNIAL OVERHAUL	OCT-DEC 85	* CATAWBA	TATF-168	BIENNIAL OVERHAUL	AUG 85
* COMET	TAKR-7	BIENNIAL OVERHAUL	JUL-SEP 84 RRF LAYUP	* NODAWAY	TAOG-78	LAYUP	
* WILKES	TAGS-33	BIENNIAL OVERHAUL	JAN 85	* ALATNA	TAOG-81	LAYUP	
MARSHFIELD	TAK-282	BIENNIAL OVERHAUL	NOV 84	* CHATTAHOOCHEE	TAOG-82	LAYUP	
VANGUARD	TAG-194	BIENNIAL OVERHAUL	OCT 84	* AEOLUS	TARC-3	STRIKE	DEC 84
REDSTONE	TAGM-20	BIENNIAL OVERHAUL	FEB. 85	* CONTENDER	TAGOS-2	MID PERIOD AVAILABILITY/ SHAKEDOWN	JUN 85
RIGEL	TAF-58	BIENNIAL OVERHAUL	AUG-SEPT 84	* TRIUMPH	TAGOS-4	POST DELIVERY	MAR 85
* BARTLETT	TAGOR-13	BIENNIAL OVERHAUL	MAR 85	* ASSURANCE	TAGOS-5	POST DELIVERY	JUN 85
* HARKNESS	TAGS-32	BIENNIAL OVERHAUL	JUN 86	* INDOMITABLE	TAGOS-7	POST DELIVERY	NOV 85
* WYMAN	TAGS-34	BIENNIAL OVERHAUL	MAY 85	* ASSERTIVE	TAGOS-9	POST DELIVERY	APR 86
* POWHATTAN	TATF-166	BIENNIAL OVERHAUL	JUL 85	* DAUNTLESS	TAGOS-11	POST DELIVERY	AUG 86
* NORTHERN LIGHT	TAK-284	BIENNIAL OVERHAUL, LAYUP	MAY-SEP 84	* NAVAJO	TATF-169	MID PERIOD AVAILABILITY	MAY 85
* SATURN	TAFS-10	MAJOR MODIFICATION	NOV 85	* ALBERT J. MEYER	TARC-6	MID PERIOD AVAILABILITY	FEB 85
* NEOSHO	TAO-143	MID PERIOD AVAILABILITY	MAY 85	* PONCHATOLA	TAO-148	MID PERIOD AVAILABILITY	APR 85
* KANE	TAGS-27	MID PERIOD AVAILABILITY	FEB 85	* JUPITER	TAKR-11	MID PERIOD AVAILABILITY	JUL 85
* APACHE	TATF-172	MID PERIOD AVAILABILITY	OCT 84	* MERCURY	TAKR-10	MID PERIOD AVAILABILITY	MAR 85
* BOWDITCH	TAGS-21	MID PERIOD AVAILABILITY	MAY 85	* SILAS BENT	TAGS-26	MID PERIOD AVAILABILITY	JAN 85
* RANGE SENTINEL	TAGM-22	MID PERIOD AVAILABILITY	SEPT 84	* MIZAR	TAGOR-11	MID PERIOD AVAILABILITY	NOV 84
* SIRIUS	TAFS-8	MID PERIOD AVAILABILITY	MAR 85	* DESTIEGUER	TAGOR-12	MID PERIOD AVAILABILITY	JAN 85
* LYNCH	TAGOR-7	MID PERIOD AVAILABILITY	JAN 85	CONTRACT OPERATED			
* HAYES	TAGOR-16	IN REDUCED OPERATING STATUS		* MAUMEE	TAOT-149	BIENNIAL OVERHAUL	SEP 84
* VINDICATOR	TAGOS-3	POST DELIVERY	OCT 84	* YUKON	TAOT-152	BIENNIAL OVERHAUL	JUN 86
* PERSISTENT	TAGOS-6	POST DELIVERY	AUG 85	* SEALIFT PACIFIC	TAOT-168	BIENNIAL OVERHAUL	APR 85
* PREVAIL	TAGOS-8	POST DELIVERY	JAN 86	* SEALIFT ARABIAN SEA	TAOT-169	BIENNIAL OVERHAUL	JUN 85
* INVICIBLE	TAGOS-10	POST DELIVERY	JUN 86	* SEALIFT CHINA SEA	TAOT-170	BIENNIAL OVERHAUL	JUL-SEP 84
* VIGOROUS	TAGOS-12	POST DELIVERY	NOV 86	* SEALIFT INDIAN OCEAN	TAOT-171	BIENNIAL OVERHAUL	AUG 86
PACIFIC FLEET				* SEALIFT ATLANTIC	TAOT-172	BIENNIAL OVERHAUL	DEC 85
* SPICA	TAFS-9	MAJOR MODIFICATION	SEPT 84	* SEALIFT MEDITERRANEAN	TAOT-173	BIENNIAL OVERHAUL	SEP 84
* SIOUX	TATF-171	BIENNIAL OVERHAUL	JUL 85	* SEALIFT CARIBBEAN	TAOT-174	BIENNIAL OVERHAUL	JUL 85
* NAVASOTA	TAO-106	BIENNIAL OVERHAUL	FEB 85	* SEALIFT ARCTIC	TAOT-175	BIENNIAL OVERHAUL	MAR 86
* SOUTHERN CROSS	TAK-285	BIENNIAL OVERHAUL	DEC 84 POSS LAYUP	* SEALIFT ANTARCTIC	TAOT-176	BIENNIAL OVERHAUL	FEB 85
* CHAUVENET	TAGS-29	BIENNIAL OVERHAUL	NOV 84	FLEET UNASSIGNED			
* KILAUEA	TAE-26	BIENNIAL OVERHAUL	AUG-SEPT 84	* ZEUS	TARC-7	PSA SHIPYARD	JAN 85
* OBSERVATION ISLAND	TAGM-23	BIENNIAL OVERHAUL	FEB 85	* VEGA	TAK-286	BIENNIAL OVERHAUL	JUN 85
* DUTTON	TAGS-22	BIENNIAL OVERHAUL	JUN 85	* ALGOL	TAK-287	BIENNIAL OVERHAUL	JUN 86
* H.H. HESS	TAGS-38	BIENNIAL OVERHAUL	NOV 84	* STALWART	TAGOS-1	MID PERIOD AVAILABILITY/ SHAKEDOWN	MAR 85
* FURMAN	TAK-280	BIENNIAL OVERHAUL	SEP 84				
* METEOR	TAKR-9	BIENNIAL OVERHAUL	JUL 85				

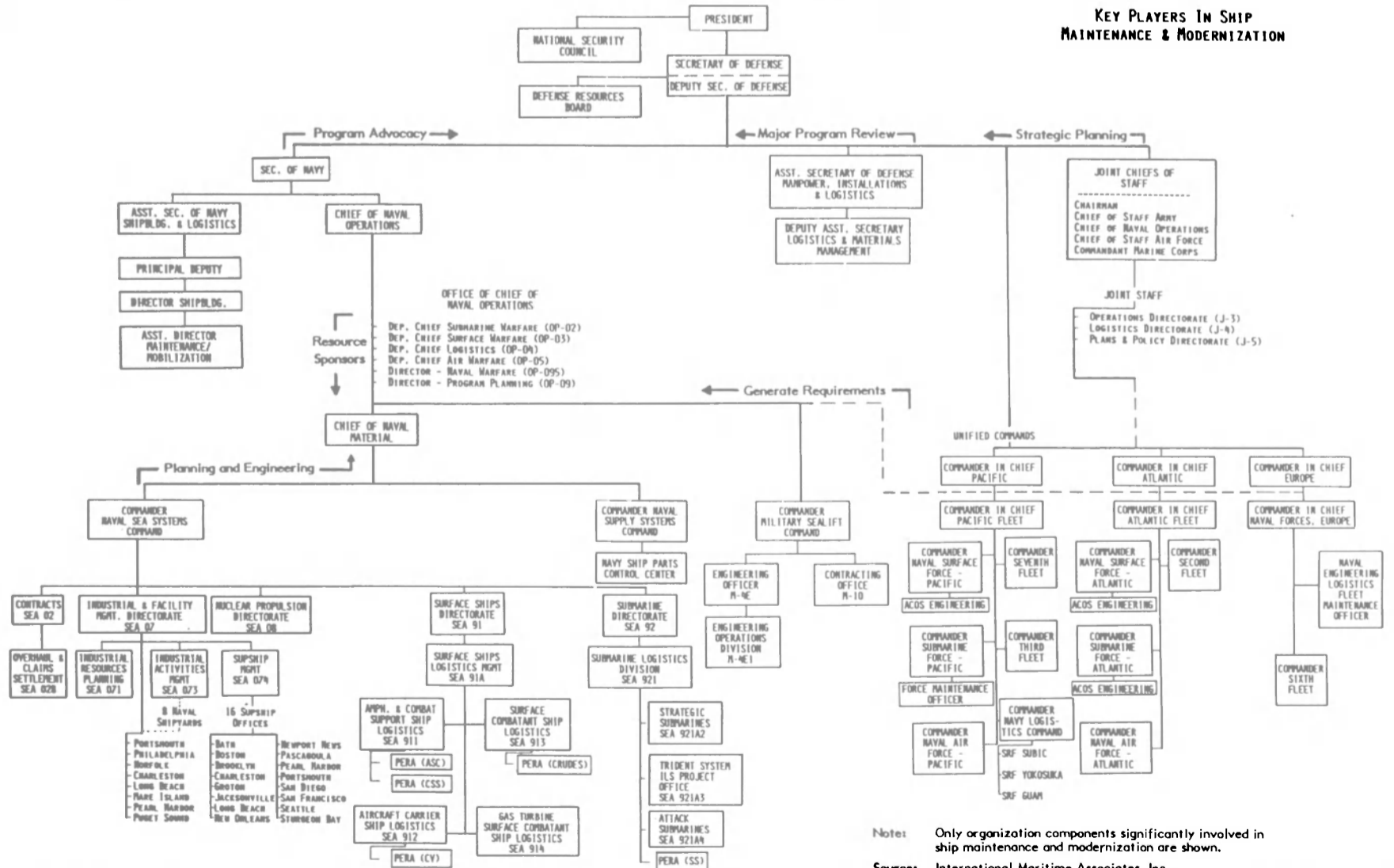
Source: Military Sealift Command

4. NAVY SHIP MAINTENANCE ORGANIZATION

The attached organization chart shows the DOD components involved in Navy ship maintenance and modernization.

It should help in understanding the role and position of the key players.

Specific names and telephone numbers for marketing follow-up are listed in the IMA update.



ELECTRONICS UPDATE

Sperry Introduces New 340-mm Radar, New Autopilot, And 'Marinized' PC

Free Color Brochures Available

New 340 Radar Replaces Popular 4016 Series

Sperry Corporation has just introduced a new 340-millimeter-diameter radar to replace its popular line of Mk 4016 radars for large- and medium-size ships. Known as the 340 radar, the new system incorporates many of the features that were options on the Mk 4016 series, including a radar interface canceller, a free-footed electronic bearing line, and an off-centering display. The 340 also incorporates Sperry's new high-brightness display that permits viewing in daylight without use of a hood.

The new radar system will be offered in the full choice of configurations offered in the Mk 4016 series, including X band, S band, and horizontal and circular polarizations. The radar also meets the new International Maritime Organization (IMO) standards that require ships of more than 10,000 gt to be equipped with a radar that has an effective minimum display of 340 millimeters.

The "daylight" viewing option is achieved by having the radar data stored into the system, enabling the radar sweep to "paint" the scope

New Sperry 340 radar will replace the company's line of Mk 4016 radars, and will meet new IMO regulations for minimum display size. The unit uses a new bright daylight viewing system for the radar scope that eliminates the need for a hood.



several times with the data.

For further information and a free brochure on the 340 radar,

Circle 34 on Reader Service Card

New Autopilot Is Highly Cost-Effective System

Sperry recently introduced its new SRP-690 Gyropilot® for a wide range of ship sizes. The new unit, which replaces the company's widely used Universal Gyropilot, is a highly cost-effective system that combines the most popular features of the Universal Gyropilot with several new options. The system is packaged in a modular design that permits tailoring of the Gyropilot to the precise requirements of the shipowner. The modular design also permits easy upgrading aboard ship if additional features should ever be desired after initial installation. The SRP-690 can be operated as a conventional autopilot, or it can make use of an optional, fuel-saving adaptive steering module.

New Sperry SRP-690 Gyropilot® replaces the company's widely used Universal Gyropilot aboard many types of ships. This analog autopilot has a modular design so that individual features can be tailored to the needs of a shipowner, and offers as an option Sperry's adaptive steering module, which has already been proven as a fuel-saving feature in actual ship usage.



The system also includes a built-in steering repeater, a dual pilot watch alarm, and a magnetic compass pick-off option, which permits use of either a magnetic compass or gyrocompass for heading references.

For additional data and free literature on the SRP-690,

Circle 35 on Reader Service Card

Marine Version of Sperry New Personal Computer

Sperry recently announced that it is developing a marine version of its new personal computer (PC). The company's Aerospace and Marine Group has tested and developed modifications to the Sperry PC that will allow it to be used aboard ship. Called the Pelagos, the modified PC is shock-mounted to enable it to survive the vibration and shock of the shipboard environment, and is shielded from electronic interference. A line-surge suppression module has also been added to protect the computer from the voltage spikes that tend to be common aboard ship.

Sperry's PC, which is rated as 99 percent IBM-compatible, is capable of running thousands of software programs available for the IBM PC. Among those most suitable for marine applications are inventory management programs, payroll management programs, and general ledgers. Using special marine software programs, the Pelagos PC can calculate ship stability and position from star sightings. Sperry has available a program that will allow the computer to format telex messages for voice channels of the marine satellite communications network, providing a ten-fold savings over the use of telex channels—the marine equivalent of "electronic mail."

For further information and a free brochure on the PC,

Circle 36 on Reader Service Card

New Features Added To Ship Control Center

Sperry has also recently added new features to its SRP-2000 ship control center, which was introduced in 1983. The system, which is capable of displaying all steering and navigation information from a single console, has been adapted for easier retrofit into existing ships.

Sperry has also added a controlled rate of turn feature to the SRP-2000, allowing a preprogrammed final heading to be fed into the system, along with a precise rate of turn, for more accurate confined-waters maneuvering. In addition, the SRP-2000 can now display fuel management data that is important to increasing efficiency. This data includes fuel flow, fuel consumed per mile, and slip.

Sperry has also developed a new self-synchronized heading repeater for the SRP-2000 that does not need to be reset with the master compass. The SPR-2000 also permits remote display of essential information.

For additional data and a free brochure on the SRP-2000,

Circle 37 on Reader Service Card

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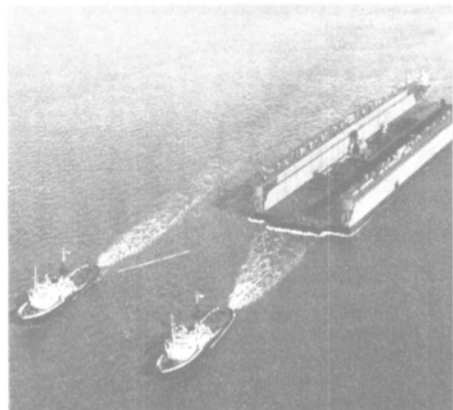
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Twin Matson Container Barges Christened At McDermott Shipyard

Matson Navigation Company's twin container barges, Haleakala and Mauna Loa, have been christened and are nearing completion at McDermott Shipyard in New Iberia, La. The 350-foot by 64.5-foot barges will enter service early next year in Matson's "Neighbor Islands" feeder service between Honolulu and Hilo, Hawaii; Kahului, Maui; and Nawiliwili, Kauai.

The Haleakala was christened by **Vera Wasacz**, wife of Alexander & Baldwin senior executive vice president **M.S. Wasacz**. The Mauna Loa was christened by **Harriet Baldwin**, wife of **R.H. Baldwin**, a retired director of Alexander & Baldwin, Matson's parent company.

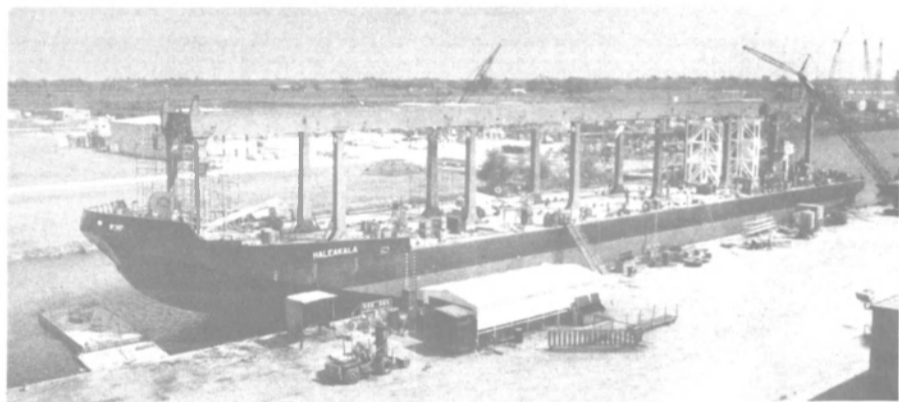
Matson reports that the total cost of each barge will be about \$9.5 mil-

lion, including the cost of the unique container-handling crane that will keep the boxes parallel with the barge during loading and unloading operations. The crane will travel atop massive steel girders supported by pillars rising from the deck. Other innovations include adjustable cell guides for securing containers and a remote-controlled stern thruster to aid in docking. Each barge will have a capacity for about 216 containers of various sizes, and 1,700 tons of molasses.

When shipyard work and machinery and electrical tests are completed on both barges, they will be towed from the Gulf of Mexico to Honolulu by a Dillingham tug. The 7,200-mile trip was expected to take about 34 days.



Official party at Haleakala christening ceremonies included (L to R): **Vic Gibson**, McDermott Shipyard division manager; **John C. Couch**, Matson executive vice president; **M.S. Wasacz**, senior executive vice president for Alexander & Baldwin and former Matson president; **Mrs. Vera Wasacz**, sponsor; **Francisco San Miguel**, McDermott vice president-general manager, shipyard operations; and **A.J. Haskell**, Matson senior vice president-engineering and marine operations.



Matson barge Haleakala shown nearing completion at McDermott Shipyard in New Iberia, La. The 350-foot vessel is one of two that Matson will operate in Hawaiian Islands.

Renk Offers Reference List Of Marine Gear Units Used In Naval Vessels

Renk of Augsburg, West Germany, has published a 24-page booklet that contains a list of marine gear units used in naval vessels.

Renk marine gear units are designed in such a way that they are suitable for use in both merchant vessels and warships, and the present reference list includes gear units that, due to this design concept, are used in warships. The list gives the year of construction; name and type of vessel; the shipyard where built;

gear unit quantity and type; power per gear; speeds; and type of propulsion plant. The list covers the years 1954 through 1984/85.

The booklet has an introduction which points out that gear units of the Renk Company are in operation in power stations, steel works and rolling mills; they are used in the cement industry, chemical industry, and the plastics industry; and in addition to these, Renk marine gears and vehicle transmissions can be found anywhere in the world. The production range is complemented by drive elements such as couplings, clutches, plain bearings, and by gears of all types.

The publication is illustrated with photos of various types of warships that are equipped with Renk gear units, with an explanation of the number and type used.

For a free copy of the reference list of Renk marine gear units used in naval vessels,

Circle 24 on Reader Service Card

Stolt-Nielsen Forms New Division For Inland And Coastal Bulk Movements

Stolt-Nielsen Inc. of Greenwich, Conn., has announced the establishment of a new Transportation Services Division that will provide inland and coastal transportation of bulk liquids by parcel stainless steel barges, rail, or truck services linking major U.S. ports with inland destinations. This new service is also available in South America, Europe, and the Far East.

Jacob Stolt-Nielsen Jr., chairman of Stolt Tankers & Terminals (Holdings) S.A., said, "By combining our business divisions of tankers, terminals, tank containers, transportation services, and the company's international network of offices, we are able effectively to offer the customer door-to-door international bulk liquid distribution."

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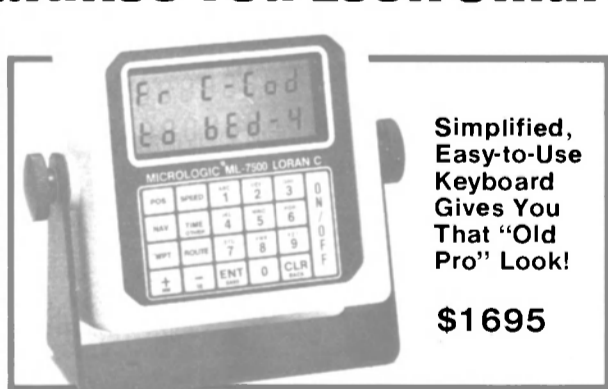
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Renk Offers Literature On RCF Generator Gears

Renk of Augsburg, West Germany, has available new literature on the Renk-Constant-Frequency (RCF) gear unit. The publication states that all shipowners ask for more cost-effective power generation onboard than was formerly possible, and one answer is the Renk-Constant-Frequency gear "RCF System." The RCF System features a differential epicyclic gear and a Renk Controller. An epicyclic gear unit with hydrostatic or electric superposition enables the generation of economic current onboard by the large diesel engine of the main propulsion plant.

The literature mentions that the RCF System constitutes a design solution that offers definite economical advantages, especially in plants incorporating low-speed diesel engines and fixed-pitch propellers. However, the RCF System is also used with controllable-pitch propellers and in medium-speed diesel engine propulsion systems. With the aid of the RCF System, the economy of the low-speed marine diesel engine is extended to include power generation onboard.

Installation variants of the RCF System are listed, with diagrams, such as parallel, vertical, rectangular, Z-arrangement as shaft-mounted generator, U-arrangement as shaft-mounted generator, and special solutions. The mode of functioning of the RCF System and the design of the system are also discussed and illustrated with drawings, diagrams, and charts. Advantages of the RCF System are discussed thoroughly, and the two variants of the Renk-RCF gear unit are detailed along with diagrams.

For a copy of the literature and further information,

Circle 17 on Reader Service Card

Kidde Offers Free Brochure On Total Fire Protection

Total fire protection is the subject of an eight-page full-color brochure from Walter Kidde, Division of Kidde, Inc., of Wake Forest, N.C. The company designs and manufactures a complete line of fire protection equipment: portable extinguishers; pre-engineered systems; and large-scale, custom-engineered systems for major applications such as refineries, pipelines, tankers, satellite tracking stations, and energy storage facilities. Kidde also supplies the full spectrum of modern fire-fighting agents in the systems, including Halon 1301, carbon dioxide, high and low expansion foam, and the leading dry chemicals.

The attractive three-hole-punched brochure states that in today's changing environment, it is becoming more important for companies to install in-depth safety and security systems that provide such functions as surveillance, detection, alarm, and suppression or inertion.

November 15, 1984

Walter Kidde can provide all phases of safety, security and protection system development from planning and surveying, through design and manufacturing, to commissioning, and after-sales service. Kidde's large-scale, engineered systems protect ships, planes, manufacturing processes and facilities, LNG plants, pipelines, computer centers, radio and TV stations, libraries, and satellite tracking stations around the world, and the company's sales and service facilities at present encircle the globe.

The publication points out that Walter Kidde has an experienced team of project management engineers who oversee each phase of a contract and their responsibilities include customer liaison, planning and engineering coordination, site installation construction, and system commissioning. An important segment of Kidde's commissioning operation is the training of customers' on-site safety teams in proper operation, inspection, and servicing of fire protection system equipment.

The brochure is well illustrated with color photos of various installations protected by Walter Kidde systems, such as the liquefaction facilities located at Arzew, Algeria, the Zeebrugge, Belgium LNG plant, the Trans-Alaska Pipeline, a series of 75 turbine compressor pump stations inside Soviet Russia, various LNG projects from Japan and the USA, etc., as well as fire protection systems on huge LNG tankers.

For a free copy of the brochure

and further literature containing full information,

Circle 16 on Reader Service Card

Alexander Industries Named Agent For Clow/Greenberg —Free Brochure Available

Alexander Industries, Inc. of New Orleans and Houston, a specialist in supplying the marine and offshore industries, has been appointed Gulf Coast agent for Clow/Greenberg bronze marine valves and fittings. According to Alexander vice president **Jim Bishop**, the Clow/Greenberg line is backed by more than 125 years of engineering and manufac-

turing experience.

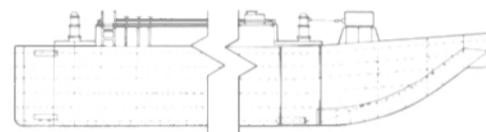
These bronze valves, which are manufactured to various specifications including globe, angle, check, gate, and hose valves; Macomb strainers; voice tube fittings; fueling spools; flanges; and handwheels and hub blanks.

With their diversity and flexibility, Greenberg valves may be used in shipboard air, steam, oil, or water lines. All Clow/Greenberg valves meet or exceed military and commercial requirements for marine valves. In addition, they can be manufactured to individual customer specifications.

For further information and literature on Clow/Greenberg valves and fittings,

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ELECTRONICS UPDATE

Magnavox Introduces Civil Global Positioning System —Literature Available

Magnavox Advanced Products and Systems Company of Torrance, Calif., recently announced the availability of a civil Global Positioning System (GPS) navigator (shown below). Designated the T-Set, it is a C/A code receiver with system accuracy equal or superior to the Magnavox Z-Set developed under the Phase I Military GPS Program, which demonstrated 30-35 meter dynamic accuracy during field tests. Actual accuracy obtainable depends upon the quality of orbit parameters and clock corrections transmitted to the satellites.

The T-Set consists of the following components: electronics unit, consisting of VT-103 terminal, PDP-11/23 computer, Magnavox GPS receiver card, and Magnavox positioning and navigation software; antenna assembly; and coaxial cable (100 meters).

Five independent receiver channels are provided in the T-Set to permit continuous tracking of the four currently best satellite signals while the fifth channel gathers ephemeris data from all other potentially useful satellites. This al-



lows the T-Set both to switch satellites without delay and to respond quickly to vehicle dynamics, thus insuring optimum accuracy at all times.

Differential GPS navigation is a planned option. One T-Set at a fixed site will monitor the available satellite signals and compute range and Doppler corrections. Navigating T-Sets will receive and apply the corrections before computing each navigation solution. Differential accuracy is expected to be five meters or better, taking full advantage of the five-channel receiver design.

Extended navigation coverage is available when altitude is known, e.g., for marine use, by means of the automatic geoidal height correction that permits navigation with only

three satellite signals. With a rubidium or cesium frequency standard, navigation can continue when only two satellites are available.

Data displayed on the T-Set include time, position, speed, course, satellite number, azimuth, elevation, signal-to-noise, range residuals, solution variance, and dilution of precision. Satellite alerts and status data also are displayed. These data plus the almanac, ephemeris, and all pseudorange and Doppler measurements are available via the RE-232 data port. A lower rate of navigation results may be recorded by the internal cartridge tape drive.

The T-Set is intended for sale or lease to customers who are interested in obtaining experience with

GPS. The system is designed for operation in a controlled environment. Environmental, physical, and electrical characteristics of the T-Set are defined by the VT-103 Terminal specification.

The GPS satellites currently in operation are experimental in nature, and the U.S. Government has the right to modify or terminate the operation of these satellites at any time. The sale or lease of the T-Set to customers outside the United States is subject to U.S. Government regulations.

For more information and complete literature on the T-Set,

Circle 10 on Reader Service Card

IMODCO Awarded Contract By Esso Suez For Mooring Terminal Offshore Egypt

IMODCO of Los Angeles, a unit of AMCA International Corporation and pioneer offshore marine terminal company, has been awarded a contract by Esso Suez, Inc. for a catenary anchor leg mooring (CALM) terminal. This unit for Esso is designed to securely moor tankers of up to 85,000 dwt, primarily for the loading of crude oil in the Gulf of Suez, offshore the East Coast of Egypt. The value of the contract was not disclosed.

This terminal, nearly 28 feet in diameter and 10 feet deep, will be installed in 95 feet of water. In addition to a 16-inch diameter line to load crude oil, the cargo system includes a 12-inch diameter line to simultaneously unload tanker de-

ballast water to an on-shore treatment facility.

IMODCO installations are a common sight in Egyptian waters. An inventory buoy was provided to Arabian Petroleum Pipeline Company (SUMED) in 1982 for Sidi-Kerir in the Mediterranean for replacement use when two previous buoys sold to SUMED in 1976 underwent overhaul. Two other IMODCO buoys remain in operation for the same company in the Gulf of Suez.

Pitcock Appointed Vice President-General Manager Of Anixter-Cincinnati

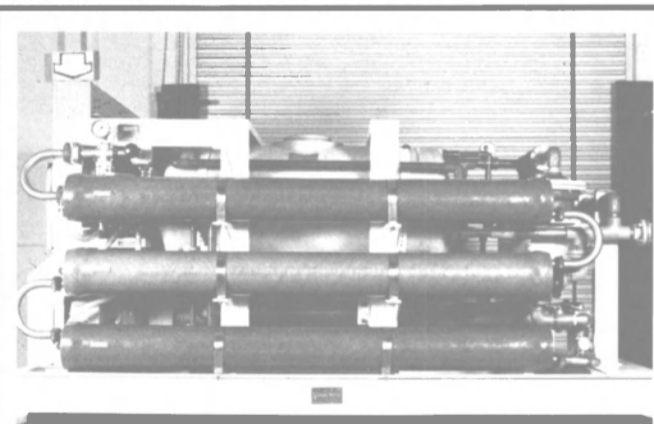
Ron Pitcock has been named vice president and general manager of Anixter-Cincinnati, a joint venture between Anixter Bros., Inc., of Skokie, Ill., and Cincinnati Bell, it was announced by John Egan, executive vice president of Anixter Bros. Mr. Pitcock will be responsible for directing Anixter-Cincinnati's overall operations.

A veteran of the communications industry, Mr. Pitcock has been with Anixter since 1980. He has held a variety of sales and management positions with the company, most recently as CATV district manager-Houston.

Anixter-Cincinnati supplies a complete line of telecommunications systems and equipment, CATV equipment, and electrical and electronic wire and cable to a three-state area that includes parts of Ohio, Kentucky, and Indiana.

Murphy And Doty Promoted At Dixie Carriers

Olen Murphy has been appointed safety and training coordinator for Dixie Carriers, Inc. of Harvey, La. Under the direction of the manager of administration, he will assist operations management in developing and maintaining safe standard operating procedures and training programs for vessel personnel, and will be responsible for administration of the company's safe-



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Circle 247 on Reader Service Card

ty programs. He has been employed by Dixie Carriers since 1982 in various capacities within the Operations Department.

Craig T. Doty has been named port captain, reporting to the operations manager. He will be responsible, along with the company's other port captains, for supervising all vessel personnel and for vessel operations. He joined Dixie in 1978 as a deckhand aboard inland vessels and worked in that capacity as well as tankerman and able-bodied seaman on inland and offshore vessels through 1979. In 1980 he entered the company's pilot training program and has since been employed as pilot, senior pilot, and captain on both inland and offshore vessels.

Halpin Elected Chairman Of American Association Of Port Authorities

W. Gregory Halpin, port administrator of the Maryland Port Administration, was elected chairman of the AAPA at the group's recent annual convention in Quebec City, Canada. **Alvaro Gallardo**, commissioner of the Instituto Costarricense de Puertos de Pacifico, San Jose, Costa Rica, was named chairman-elect.

Elected first and second vice chairmen, respectively, were **Richard P. Leach**, executive director of the Port of Houston Authority, and **Carmen J. Lunetta**, port director of the Port of Miami.

Dana Offers New Brochure On Wichita Power Takeoff

A new four-page brochure describing the Wichita® mechanical power takeoff (PTO) that transmits and disconnects power from heavy-duty industrial diesel engines is now available from the Power Transmission Division of Dana Corporation, Toledo, Ohio.

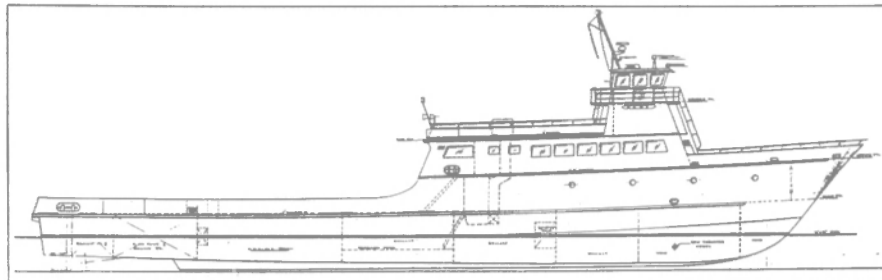
Highlighted in the brochure are the Wichita PTO's design advantages, including its incorporation of the heavy-duty Spicer® Angle-Spring® clutch for automatic self-adjustment and constant plate load throughout the wear life of the unit. The brochure also describes typical PTO applications, and gives detailed instructions for PTO selection. Included for quick reference are PTO selection charts for the four major brands of diesel engines.

Complete engineering and dimensional information for the PTO are provided in line drawings accompanied by tables. Also included are toll-free numbers of regional sales offices where additional technical information may be obtained.

For a free copy of the new Dana brochure,

Circle 11 on Reader Service Card

November 15, 1984



Profile of the ferry for Fishers Island.

Eastern Marine Signs Contract For Passenger/Auto Ferry

Eastern Marine, Inc., Panama City, Fla., recently signed a contract with the Fishers Island Ferry District, Fishers Island, N.Y., for the construction of a 162-foot by 33-foot by 9-foot 10-inch double-screw Caterpillar-powered passenger/auto ferry.

The new vessel will be put into service in the spring of 1985 and will be used to transport passengers, autos, freight, etc., between New Lon-

don Conn., and Fishers Island, N.Y.

The new Eastern Marine-built ferry will be capable of transporting approximately 225 passengers and 35-40 autos, replacing the present ferry that is capable of transporting only 10 autos. The upgrading to a larger vessel is due to the increased demand for service, especially during the period from June through September.

The Fisher s Island Ferry District was established in 1947 and made its first ferry run in late 1950.

Eastern Marine is a growing company that has earned a reputation in recent years as a builder of high quality vessels with exceptionally good workmanship. The company opened their Panama City shipyard in 1978. This 13-acre facility has over 1,300 feet of water frontage and is used primarily to construct medium to small sized boats. Fifteen miles east of the Panama City yard, the company opened another shipyard in Allanton, in 1981. This facility is substantially larger and is used to construct larger vessels. It comprises 135 acres with more than 5,200 feet of water frontage.

In late 1983, Eastern Marine acquired a 10-acre ship repair facility in Panama City. Equipped with two marine railways, the yard is used for defense and commercial repair and haulouts. The new repair yard is part of Eastern Marine's effort to diversify their capabilities in the shipbuilding and ship repair industry.

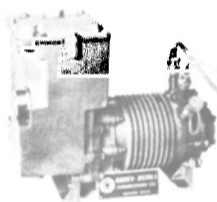
For complete free literature on Eastern Marine's facilities and capabilities.

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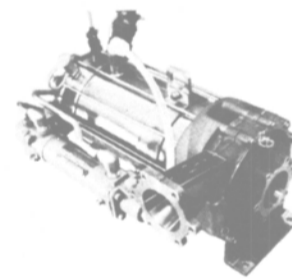
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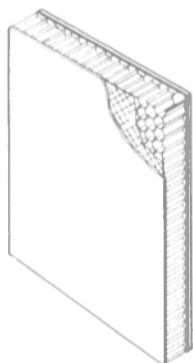
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This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 24 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) 689-3266.

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Federal Harco, P.O. Box 40310, Houston, TX 77240
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Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

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CLEMCO, P.O. Box 7680, San Francisco, CA 94120
E.I. DuPont de Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Key Houston Division of Jacksonville Shipyards, 13911 Atlantic Blvd., Jacksonville, FL 32225

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B&D Marine and Industrial Boilers, Inc., P.O. Box 5702, North Charleston, SC 29406
Combustion Engineering, Inc., Windsor, CT 06095
Foster Wheeler Boiler Corp., 110 S. Orange Ave., Livingston, NJ 07039

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Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401

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MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

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Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, PA 18936

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Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

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Maritime Data Network, Ltd., 102 Hamilton Ave., Stamford, CT 06902

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Argo Marine, 140 Franklin St., New York, NY 10013
ASEA, Inc., 4 New King St., White Plains, NY 10604
Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2

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Bowmar/ALI, Inc., 531 Main St., Acton, MA 01720

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Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205

Failsafe Motor/Generator Protector, Marine Safe Electronics Ltd., 101 Jardin Dr., Unit 24/25, Concord, Ontario, Canada L4K 1B6

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ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202

Indikon Corp., 26 New St., Cambridge, MA 02135

Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738

Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054

Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696

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Megasystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431

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Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France

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Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039

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Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 4475 Mission Blvd., Suite 235, San Diego, CA 92109
Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Assoc., Inc., 8150 Leesburg Pile, Vienna, VA 22202
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
New England Engineering & Marine Services, Rt. 2, Box 50, York, ME 03909
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
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Timsco, 622 Azalea Road, Mobile, AL 36609
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CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
Cybernet International, Inc., 7 Powder Horn Dr., Warren, NJ 07060
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
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Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Kongsberg Vopentfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
Lorain Electronics Corp., 2307 Leavitt Rd., Lorain, OH 44052
Magnum Distributors Inc., 1000 S. Dixie Hwy. #3, Pompano Beach, FL 33060
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
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Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson Autopilot, 400 Oser Ave., Hauppauge, NY 11738
Servo Corporation of America, 111 New South Road, Hicksville, NY 11802
Simrad, Inc., 2208 N.W. Market St., Suite 600, Seattle, WA 98107
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067

OILS—Marine—Additives

Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

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Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Hyde Products, Inc., 810 Sharon Dr., Westlake, OH 44148
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Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696

PAINTS—COATINGS—CORROSION CONTROL

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Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
A.W. Chesterton Co., Middlesex Industrial Park, Rt. 93, Stoneham, MA 02180
Chugaku Marine Paints (U.S.A.) Inc., 1290 Ave. of Americas, New York, NY 10104
CLEMCO, P.O. Box 7680, San Francisco, CA 94120
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklinton Rd., Baltimore, MD 21223
Dampney Company, Inc., 85 Paris St., Everett, MA 02149
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
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E.I. DuPont de Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898

Glidden Coatings & Resins, Architectural & Maintenance, 925 Euclid Ave., Cleveland, OH 44115
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 2425 Fountainview, Suite 340, Houston, TX 77057; P.O. Box 10265, New Orleans, LA 70181

International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jatun Marine Coatings Inc., 840 Key Hwy., Baltimore, MD 21230
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650

Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203

Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143
Sermatech International, 4401 SermeTel Dr., Mass Point, MS 39563

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings

Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Crawford Fitting Company, 29500 Solon Rd., Solon, OH 44139
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Rd., Pascoagoula, MS 39567
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
Tioga Pipe Supply Co. Inc., 2450 Wheatstheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications

Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
Norton Chemplast, 309-150 Dey Rd. Wayne NJ 07470

PLYWOOD

Simson Timber Co., Third and Franklin, Sheton, WA 98584

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Aquamaster Inc., 4125, 9th Avenue N.W. Seattle, WA 98107
Armo Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
Bird-Johnson Company, 110 Norfolk St., Walpole, MA 02081
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Capitol Gears, 349 N. Hamline Ave., St. Paul, MN 55104
Caterpillar 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

Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
George Engine Company, Inc., Lafayette, LA
General Motors, Electro-Motive Division, LaGrange, IL 60525
Goltan Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
Isotta Fraschini S.p.A., c/o Italian Aerospace Industries (U.S.A.), Inc., 1235 Jefferson Davis Hwy., Suite 500, Arlington, VA 22202
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada

KaMeWa, P.O. Box 1010, S-68101, Kristinehamn, Sweden
KaMeWa, 1800 West Loop So., Suite 1620, Houston, TX 77027
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Høleby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209

MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
Maritime Industries Ltd., 6307 Laurel St., Burnaby, B.C., Canada V5B 3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037

North American Marine Jet P.O. Box 1232 Benton, AR 72015
Omnihruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
Penske GM Power, Lodi N.J., 180 Rt. 17 South, Lodi, NJ 07644
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201

Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Karl Senner, Inc., P.O. Box 10055, New Orleans, LA 70181
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512

Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Transamerica Delaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621

Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021

Valvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505

Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives

Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX 710-730-5224
Ingersoll—Rand Pump Group, Dept. B—346, Washington, N.J. 07882
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110

Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
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 Mfg. Co., Inc., Willow Avenue, Honesdale, PA 18431
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621

SANITATION DEVICES—Pollution Control

Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Sewage Systems, Div. of St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111

National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

SCAFFOLDING EQUIPMENT—Work Platforms

McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
Trus-Joist Corp., P.O. Box 60, Boise, ID 83704

SCUTTLES/MANHOLES

Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
Crane Packing Company, 435 Regina Dr., Clarksberg, MD 20734
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470

SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217

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

SHIPBUILDING EQUIPMENT

Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

SHIPBUILDING STEEL

Armo Steel Corp., 703 Curtis St., Middletown, OH 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
United States Steel Corp., Christy Park Plant, 2214 Walnut St., McKeesport, PA 15132

Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking

Advanced Technology, Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102
Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland

Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066

Asmar Shipyards Co., Astilleros y Maestranzas de la Armada, Prat 856, Piso 14, Casilla 150-V, Valparaiso, Chile, S.A.

Astilleros Balboa, S.a., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004

Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530

Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018

Burmeister & Wain Skibsværft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark

Burrard Yarrow Corporation, P.O. Box 86099, North Vancouver, B.C., Canada

Cantieri Navali Riuniti, Via Cipro, 11, 16100 Geneva, Italy
Conrad Industries, P.O. Box 790, Morgan City, LA 70380

Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10040

Daewoo International (America) Corp., 437 Madison Ave., New York, NY 10022

Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Changsung-PO Koje-Kun, Kyungnam, Korea

Davie Shipbuilding Ltd., P.O. Box 130, Lewis, Quebec, Canada G6V6N7
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa

Dravo Marine Equipment Company, Neville Island, Pittsburgh, PA 15225
Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates—U.S.A.

Agents: Keppel Marine Agencies, Inc., 26 Broadway, New York, NY 10040, 6240 Richmond Ave., Houston, TX 77057

Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, OR 97208

Far East Livingston Shipbuilding Ltd., 31 Shipyard Rd., Jurong Town, Singapore 2262

Genstar Marine, 10 Pemberton Ave., No. Vancouver, B.C., Canada V7P 2R1

Gladding-Hearn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725
Goltan Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231

HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189

Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong

Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771

Jeffboat Inc., Jeffersonville, Ind. 47130
Jered Brown Brothers, Inc., 56 S. Squair Rd., Auburn Hills, MI 48057

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
Kone Corp. P.O. Box 6 SF-05801 Hyvinkaa, Finland

Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany

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

Main Iron Works, Inc., P.O. Box 1918, Hauma, LA 70361
Marinette Maine Corporation, Marinette, WI 54143

Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Tokyo, 100 Japan

MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077

Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202

National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048

National Steel & Shipbuilding Corp., San Diego, CA 92112
Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089

Neorion Shipyards Syros Ltd., Syros, Greece—U.S.A. Agents: Keppel Marine Agencies Inc., 26 Broadway, New York, NY 10004, 6420 Richmond Ave., Houston, TX 77057

Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607

Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22

Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905
Rauma-Repola, 26100 Rauma 10, Finland

Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyeong-ro, Chung-ku, Seoul, Korea

St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113

Tampa Shipyards Inc., P.O. Box 1277, Tampa, FL 33601
Thomas Marine, 37 Bransford St., Patchogue, NY 11772

Todd Shipyards Corp., 1 State St. Plaza, New York, NY 10004
Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316

Vanguard Services, P.O. Drawer A, New Johnsonville, TN 37134
Verolme Estaleiros Reunidos Do Brasil S.A., Rua Buenos Aires, 68, Rio de Janeiro—RJ—Brazil

Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

SHIPPING—PACKING

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

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 24 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) 689-3266.

AIR COMPRESSORS

Flexaust Company, 11 Chestnut St., Amesbury, MA 01913

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Marlo Coil/Nuclear Cooling, Inc., P.O. Box 171, High Ridge, MO 63049
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrköping, Sweden

ANCHORS AND CHAIN

Baldt Incorporated, P.O. Box 350, Chester, PA 19016
G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands

ANODES—Cathodic Protection

American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240
The Platt Bros. & Co., Box 1030, Waterbury, CT 06721

BASKET STRAINERS

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

BEARINGS—Rubber, Metallic, Non-Metallic

Grant Manufacturing & Alloying, Inc., 600 Schoolhouse Rd., Souderton, PA 18964
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BLASTING—Cleaning—Equipment

Aqua-Dyne Inc., 2208 Karbach St., Houston, TX 77092
Aurand, 1270 Ellis St., Cincinnati, OH 45223
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England

CLEMCO, P.O. Box 7680, San Francisco, CA 94120

E.I. DuPont de Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Key Houston Division of Jacksonville Shipyards, 13911 Atlantic Blvd., Jacksonville, FL 32225

BOILERS

B&D Marine and Industrial Boilers, Inc., P.O. Box 5702, North Charleston, SC 29406
Combustion Engineering, Inc., Windsor, CT 06095
Foster Wheeler Boiler Corp., 110 S. Orange Ave., Livingston, NJ 07039

BOILER CLEANING

Asea Stal, 525 Executive Blvd., Elmsford, NY 10523-1296

BROKERS

S. Danoff U.S.A. Ltd., 2050 Coral Way, Miami, FL 33145
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401

BRONZES—COMMEMORATIVE

Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

BUNKERING SERVICE

Belcher Company, Inc., 8700 West Flagler, P.O. Box 525500, Miami, FL 33152
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

CARGO HANDLING EQUIPMENT

MacGregor-Navire International, Box 8991, S-402 74 Göteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

CASTINGS/FORGINGS

NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington Transport (New York) Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

CHOCKING SYSTEMS

Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, PA 18936

CLOSURES—Marine

Cornell-Carr Co. Inc., 63 Main St., Monroe, CT 06468
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

COMPUTERIZED INFORMATION SYSTEMS

Marine Management Systems, Inc., 102 Hamilton Ave., Stamford, CT 06902
Maritime Data Network, Ltd., 102 Hamilton Ave., Stamford, CT 06902

CONDENSERS

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

CONTROL SYSTEMS—Monitoring

American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Argo Marine, 140 Franklin St., New York, NY 10013
ASEA, Inc., 4 New King St., White Plains, NY 10604
Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2

Biospherics Inc., 4928 Wyaconda Rd., Rockville, MD 20852

Bowmar/ALI, Inc., 531 Main St., Acton, MA 01720
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Failsafe Motor/Generator Protector, Marine Safe Electronics Ltd., 101 Jardin Dr., Unit 24/25, Concord, Ontario, Canada L4K 1B6
Grumman Aerospace, 111 Stewart Ave., Bethpage, NY 11714.
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Indikon Corp., 26 New St., Cambridge, MA 02136
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Maritime Protection A/S, Box 100, N-4620 Vagsbygd, Norway
Megsystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
Nav-Vue, Inc., P.O. Box 1175, Huntsville, TX 77340
Offshore Technology Corp., 578 Enterprise St., Escondido, CA 92025
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Prairie, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Seaworthy Systems Inc., 36 Main Street, Essex, CT 06426
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

COUPLINGS

SKF Steel, 201 Tower Lane, P.O. Box 745, Avon, CT 06001

CRANES—HOISTS—DERRICKS—WHIRLEYS

Appleton Marine, P.O. Box 2339, Appleton, WI 54913
ASEA Stal-Laval Inc., 525 Executive Blvd., Elmsford, NY 10523
HIAB Cranes & Loaders Inc., R.D. 22 Interchange Place, York, PA 17404
Machinexport, 35 Mosfilmovskaya Ul., 117330 Moscow, U.S.S.R.
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany

DECK MACHINERY—Cargo Handling Equipment

Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
Murdock Engineering Company, P.O. Box 2278, Irving, TX 75061
Schoellhorn Albrecht, Div. of St. Louis Ship, 3460 So. Broadway, St. Louis, MO 63118

DECKING—GRATING

Selby, Battersby & Company, 5220 Whiby Ave., Philadelphia, PA 19143

DIESEL ACCESSORIES—CYLINDER LINERS

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

Haynes Corporation, P.O. Box 179, Jackson, MI 49204

Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589

Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

DIESEL ENGINE—Spare Parts & Repair

Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Granges Repair Service GMBH, U.S. Rep: Field, Wigham and Co., Inc., 200 Middleneck Road South, P.O. Box 2123, Great Neck, NY 11021
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

ELECTRICAL EQUIPMENT

Jergens Inc., 19520 Nottingham Rd., Cleveland, OH 44110
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

VALVE ELECTRIC HEATING CORPORATION

Valad Electric Heating Corporation, 162 Willey St., Tarrytown, NY 10591
Ward Leonard Electric Co., 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

EMULSIFICATION SYSTEMS

Cleanodan A/S, N. American Agents, American United Marine Corp., 5 Broadway, Route 1, Saugus, MA 01906
Fire-Brite, Hoffert Manufacturing Co., Inc., 3749 Progress Rd., Norfolk, VA 23502
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862

EQUIPMENT—Marine

American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
ASEA Stal-Laval Inc., 525 Executive Blvd., Elmsford, NY 10523
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216

Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Fitz-Wright Suits Ltd., 17919 Roan Pl., Surrey, B.C., Canada V3S 5K1
Genstar Stone Products Company, Executive Plaza IV, Hunt Valley, MD 21031

Harvey's Commercial Marine Div., 2505 S. 252nd St., Kent, WA 98032
Imperial Manufacturing Co., P.O. Box 4119, Bremerton, WA 98312
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302

EVAPORATORS

Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Aqua-Chem Inc., P.O. Box 421, Milwaukee, WI 53201
MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS

American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Gaylord Industries, Inc., P.O. Box 558, Wilsonville, OR 97070
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663

Zidell Explorations, 3121 S.W. Moody St., Portland, OR 97201

FASTENERS

Sales Systems Limited, 7006, 700 Florida Ave., Portsmouth, VA 23707

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

Samson Ocean Systems, Inc., 99 High St., Boston, MA 02110

Seaward International, Inc., 6269 Leesburg Ave., Falls Church, VA 22044

FILTERS

Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Mueller Steam Specialty, P.O. Box 1569, Lumberton, NC 28359

FINANCING—Leasing

A.G. Becker Paribus Inc., 2 First National Plaza, Chicago, IL 60670
Gulf Western Leasing Corp., 1500 City West Blvd., Suite 300, Houston, TX 77047

FIRE PROTECTION, DETECTION & ALARM SYSTEMS

Gulf Publishing Company Video (Firefighting Videotape), P.O. Box 2608, Houston, TX 77001
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

FUEL OIL/ADDITIVES—Analysis & Combustion Testing

Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716
U.S. Borax, 3075 Wilshire Blvd., Los Angeles, CA 90010

FURNITURE

Bailey Carpenter & Insulation Co., 74 Sullivan Street, Brooklyn, NY 11231
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

GALLEY EQUIPMENT

Insinger Machine Co., 6245 State Rd., Philadelphia, PA 19135

GANGWAYS

Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960

HATCH & DECK COVERS—Chain Pipe

Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
MacGregor-Navire International, Box 8991, S-402 74 Göteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mack Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

HEAT EXCHANGERS

Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
American Standard Inc., Heat Transfer Div., Buffalo, NY 14240
Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

HOLD LINERS

Himont U.S.A., Inc., 1313 N. Market St., Wilmington, DE 19894

HULL CLEANING

Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989

Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England

Gulf International Divers, P.O. Box 1342, Gretna (New Orleans), LA 70052

Pacific Maine Services, TLX: 664540 seaserv, Long Beach, CA 90802

Petrochemical Services, Inc., 3820 Dauphine St., New Orleans, LA 70117

Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France

Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044

Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS

Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224

Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607

Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS—Generators—Systems

Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, NJ 07039
Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906

INSULATION—Cloth, Fiberglass

Bailey, Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619
Waco Inc., 5450 Lewis Rd., P.O. Box 836, Sandston, VA 23150-0836

INSURANCE

Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
MGA International, 419 Park Avenue South, New York, NY 10016
United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038

JOINER—Watertight Doors—Paneling

Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231
Masonite Commercial Division, Dover, OH 44622

Megador Inc., 441 Lexington Ave., Suite 903, New York, NY 10017
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOKERS

R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

ACR Electronics, Inc., P.O. Box 2148, Hollywood, FL 33022
Midland-Ross Corp., Russellstall Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039

Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080

Rosan, Inc., 2901 West Coast Hwy., Newport Beach, CA 92663
MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080

Rosan, Inc., 2901 West Coast Hwy., Newport Beach, CA 92663

METALS

Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068

MINING

Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020

MOORING SYSTEMS

Murdock Machine & Engineering Company of Texas, P.O. Box 2278, Irving, TX 75061

Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110

NAME PLATES—BRONZE—ALUMINUM

Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202

Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454

Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015

Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Street (Suite 201), New Orleans, LA 70130
C.A.C.I., Inc., 1815 No. Fort Myer Dr., Arlington, VA 22209

C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829

Phillips Cartner & Co., Inc., 203 So. Union St., Alexandria, VA 22314
Century Engineering, Inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052

Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, WA 98148
C.R. Cushing & Co., Inc., One World Trade Center, New York, NY 10048
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
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706

Fleetweather Ocean Services, Inc., Rd. #2, Box 260, Hopewell Junction, NY 12533

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 Glasten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104

Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480

Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107

Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331

J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, NY 10048

Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
Hoffman Maritime Consultants Inc., P.O. Box 186, Glen Head, NY 11545
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 5304, Jacksonville, FL 32201

R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Janzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
J.L. Konopasek & Associates, 3523 Scrimshaw Dr., Jacksonville, FL 32217

- John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
- McLear & Harris, Inc., 28 West 44 Street, New York, NY 10036
- Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
- Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
- Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
- Marine Power Associates, 4475 Mission Blvd., Suite 235, San Diego, CA 92109
- Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
- George E. Meese, 194 Acton Rd., Annapolis, MD 21403
- R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
- NKF Engineering Assoc., Inc., 8150 Leesburg Pile, Vienna, VA 22202
- Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
- New England Engineering & Marine Services, Rt. 2, Box 50, York, ME 03909
- Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
- Northern Marine, P.O. Box 1169, Traverse City, MI 49685
- Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
- PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
- Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
- S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317
- M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
- Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
- SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)
- STV/Sanders & Thomass, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
- Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426
- Seaworthy Engine Systems, 17 Battery Place, New York, NY 10004
- George G. Sharp, Inc., 100 Church St., New York, NY 10007
- Simmons Associates, P.O. Box 760, Sarasota, FL 33578
- R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
- J.F. Stroschein Associates, 666 Old Country Rd., Garden City, NY 11530
- Richard R. Taubler, Inc., 610 Carriage La., Dover, DE 19901
- Timco, 622 Azalea Road, Mobile, AL 36609
- Tracor Hydraulics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
- Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744
- NAVIGATION & COMMUNICATIONS EQUIPMENT**
- American Hydromath Co., Buckwheat Bridge Rd., Germantown, NY 12526
- Anschutz & Co., GmbH, Postfach 6040, D-2300 Kiel 14, West Germany
- Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
- CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
- COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
- Cybernet International, Inc., 7 Powder Horn Dr., Warren, NJ 07060
- A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
- Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
- Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
- General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
- Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
- Henschel Corp., 9 Hoyt Drive, Newburyport, MA 01950
- Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
- King Radio Corporation, 400 North Rodgers Rd., Olathe, KS 66062
- Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
- Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
- Krupp Atlas-Elektronik, 1453 Pinewood St., Rohway, NJ 07065
- Lorain Electronics Corp., 2307 Leavitt Rd., Lorain, OH 44052
- Magnum Distributors Inc., 1000 S. Dixie Hwy. #3, Pompano Beach, FL 33060
- Micrologic, 20801 Dearborn, Chatsworth, CA 91311
- Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
- Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
- Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
- Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
- Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
- Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
- Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
- Robertson Autopilot, 400 Oser Ave., Hauppauge, NY 11738
- Servo Corporation of America, 111 New South Road, Hicksville, NY 11802
- Simrad, Inc., 2208 N.W. Market St., Suite 600, Seattle, WA 98107
- Sperry Corporation, Great Neck, NY 11020
- Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
- Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067
- OILS—Marine—Additives**
- Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
- Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
- Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
- Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
- Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
- Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017
- OIL/WATER SEPARATORS**
- Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
- Biospherics Incorporated, 5001 Forbes Blvd., Lanham, MD 20801
- Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
- Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
- Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
- Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
- Hyde Products, Inc., 810 Sharon Dr., Westlake, OH 44148
- Microphor, Inc., P.O. Box 490, Willits, CA 95490
- Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
- PAINTS—COATINGS—CORROSION CONTROL**
- American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
- Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
- A.W. Chesterton Co., Middlesex Industrial Park, Rt. 93, Stoneham, MA 02180
- Chugoku Marine Paints (U.S.A.) Inc., 1290 Ave. of Americas, New York, NY 10104
- CLEMCO, P.O. Box 7680, San Francisco, CA 94120
- "CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklinton Rd., Baltimore, MD 21223
- Dampney Company, Inc., 85 Paris St., Everett, MA 02149
- Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
- Drew Ameroid Marine, One Drew Chemical Plaza, Boonton, NJ 07005
- E.I. DuPont de Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
- Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080
- Glidden Coatings & Resins, Architectural & Maintenance, 925 Euclid Ave., Cleveland, OH 44115
- Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 2425 Fountainview, Suite 340, Houston, TX 77057; P.O. Box 10265, New Orleans, LA 70181
- International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
- Jotun Marine Coatings Inc., 840 Key Hwy., Baltimore, MD 21230
- Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
- Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
- Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
- Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
- Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143
- Sermatech International, 4401 SermeTel Dr., Moss Point, MS 39563
- PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings**
- Amermarine International, P.O. Box 9205, Dundalk, MD 21222
- Crawford Fitting Company, 29500 Solon Rd., Solon, OH 44139
- Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
- Knights Piping Inc., 5309 Industrial Rd., Pascagoula, MS 39567
- Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
- Tioga Pipe Supply Co. Inc., 2450 Wheatheaf La., P.O. Box 5997, Philadelphia, PA 19137
- PLASTICS—Marine Applications**
- Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
- Norton Chemplast, 309-150 Dey Rd. Wayne NJ 07470
- PLYWOOD**
- Simson Timber Co., Third and Franklin, Sheton, WA 98584
- PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines**
- Aquamaster Inc., 4125, 9th Avenue N.W. Seattle, WA 98107
- Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
- Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
- Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
- Bird-Johnson Company, 110 Norfolk St., Walpole, MA 02081
- Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
- Capitol Gears, 349 N. Hamline Ave., St. Paul, MN 55104
- Caterpillar 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
- Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
- Combustion Engineering, Inc., Windsor, CT 06095
- Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
- Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
- Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
- George Engine Company, Inc., Lafayette, LA
- General Motors, Electro-Motive Division, LaGrange, IL 60525
- Golden Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
- Isotta Fraschini S.p.A., c/o Italian Aerospace Industries (U.S.A.), Inc., 1235 Jefferson Davis Hwy., Suite 500, Arlington, VA 22202
- KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
- KaMeWa, P.O. Box 1010, S-68101, Kristinehamn, Sweden
- KaMeWa, 1800 West Loop So., Suite 1620, Houston, TX 77027
- Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025
- Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
- M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Høleby, Denmark
- MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209
- MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
- Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
- Maritime Industries Ltd., 6307 Laurel St., Burnaby, B.C., Canada V5B 3B3
- Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
- National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
- North American Marine Jet P.O. Box 1232 Benton, AR 72015
- Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
- Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
- Penske GM Power, Lodi N.J., 180 Rt. 17 South, Lodi, NJ 07644
- Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
- Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
- SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
- Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
- Karl Senner, Inc., P.O. Box 10055, New Orleans, LA 70181
- Skinner Engine Company, P.O. Box 1149, Erie, PA 16512
- Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
- Telzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
- Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
- Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
- Transamerica DeLaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
- Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
- Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
- Valvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
- WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505
- Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
- Waukesha Engine Division, Waukesha, WI 53187
- PUMPS—Repairs—Drives**
- Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
- Ingersoll—Rand Pump Group, Dept. B—346, Washington, N.J. 07882
- Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
- Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
- Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030
- Transamerica DeLaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
- Vita Motivator Company, 200 West 20th St., New York, NY 10011
- Warren Pumps Division, Bridges Avenue, Warren, MA 01083
- 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 Mfg. Co., Inc., Willow Avenue, Honesdale, PA 18431
- Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
- DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
- Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110
- Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
- Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621
- SANITATION DEVICES—Pollution Control**
- Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
- Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
- FAST Sewage Systems, Div. of St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
- Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
- Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., NY 11696
- National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105
- SCAFFOLDING EQUIPMENT—Work Platforms**
- McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
- Trus-Joist Corp., P.O. Box 60, Boise, ID 83704
- SCUTTLES/MANHOLE**
- Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203
- SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT**
- Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
- Crane Packing Company, 435 Regina Dr., Clarksberg, MD 20734
- Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
- SHIPBREAKING—Salvage**
- The Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
- Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
- Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201
- SHIPBUILDING EQUIPMENT**
- Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
- Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
- Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway
- SHIPBUILDING STEEL**
- Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
- Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
- United States Steel Corp., Christy Park Plant, 2214 Walnut St., McKeesport, PA 15132
- Welded Beam Company, P.O. Box 280, Perry, OH 44081
- SHIPBUILDING—Repairs, Maintenance, Drydocking**
- Advanced Technology, Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102
- Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland
- Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
- Asmar Shipyards Co., Astilleros y Maestranzas de la Armada, Prat 856, Piso 14, Casilla 150-V, Valparaiso, Chile, S.A.
- Astilleros Balboa, S.a., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004
- Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
- Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
- Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
- Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
- Burmeister & Wain Skibsvaerft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark
- Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
- Cantieri Navali Riuniti, Via Cipro, 11, 16100 Geneva, Italy
- Conrad Industries, P.O. Box 790, Morgan City, LA 70380
- Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10040
- Daewoo International (America) Corp., 437 Madison Ave., New York, NY 10022
- Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Changsung-PO Koje-Kun, Kyungnam, Korea
- Davie Shipbuilding Ltd., P.O. Box 130, Levis, Quebec, Canada G6V6N7
- Dorbly Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa
- Dravo Marine Equipment Company, Neville Island, Pittsburgh, PA 15225
- Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates—U.S.A. Agents: Keppel Marine Agencies, Inc., 26 Broadway, New York, NY 10040, 6240 Richmond Ave., Houston, TX 77057
- Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
- FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, OR 97208
- Far East Livingston Shipbuilding Ltd., 31 Shipyard Rd., Jurong Town, Singapore 2262
- Genstar Marine, 10 Pemberton Ave., No. Vancouver, B.C., Canada V7P 2R1
- Gladding-Hearn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725
- Golden Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231
- HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
- Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189
- Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
- Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
- Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
- Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771
- Jeffboat Inc., Jeffersonville, Ind. 47130
- Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057
- 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
- Kone Corp. P.O. Box 6 SF-05801 Hyvinkaa, Finland
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- 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
- Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361
- Marinette Maine Corporation, Marinette, WI 54143
- Mitsubishi Heavy Industries, Ltd., 5-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 100 Japan
- MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
- Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
- Mass Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
- Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202
- National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
- National Steel & Shipbuilding Corp., San Diego, CA 92112
- Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
- Neorion Shipyards Syros Ltd., Syros, Greece—U.S.A. Agents: Keppel Marine Agencies Inc., 26 Broadway, New York, NY 10004, 6420 Richmond Ave., Houston, TX 77057
- Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
- Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
- Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
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- Rauma-Repola, 26100 Rauma 10, Finland
- Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
- St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
- Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
- Tampa Shipyards Inc., P.O. Box 1277, Tampa, FL 33601
- Thomas Marine, 37 Bransford St., Patchogue, NY 11772
- Todd Shipyards Corp., 1 State St. Plaza, New York, NY 10004
- Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316
- Vanguard Services, P.O. Drawer A, New Johnsonville, TN 37134
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Also available for these engines are two Reintjes 5:1 marine reverse and reduction gears—price upon request or make offer.

And: one new BPS two-bearing generator rated at 1000 KW, 1250 KVA, 900 RPM, 3 phase, 60 cycle, 480 volt, brushless, with DCX class F 80°C rise over 40°C ambient with space heaters, V.R. \$34,800.

And: one new Kato Engineering generator, brushless, model 1575-89736111, type 20735, rated at 1575 KW continuous, 1968 KVA at 900 RPM, 3 phase, 60 cycle, 4160 volt with voltage regulator. \$46,800.

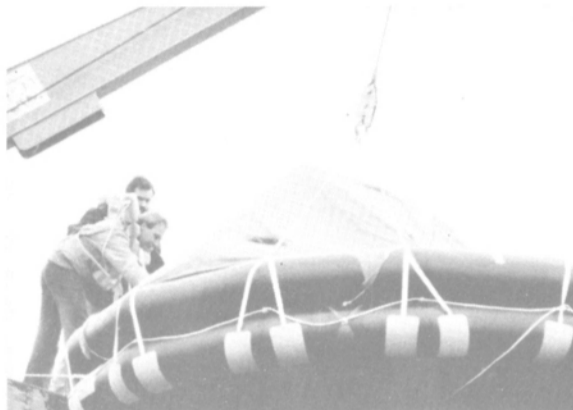
For more details, full bill or materials, etc., call Ron Monroe, Pete Hill or Dave Manro, Engine Power Co., (P.O. Box 8130, Stockton, CA 95208) (209) 946-0304.

RFD Survival Liferaft Line Gains Davit-Launch Approval —Literature Available

RFD Ltd. of Surrey, England, has now gained U.K. Department of Transport approval for the davit-launched version of its new Surviva liferaft (shown below). The approval was granted after the raft had performed successfully in a series of strength tests carried out by DoT surveyors. Designated Surviva DL, the new line is available in 12-, 16-, 20-, and 25-person capacities.

The principle of the davit-launch system is that the liferaft is inflated and boarded at deck level, and then lowered into the water with its full survivor complement on board. The system is particularly advantageous on vessels with high freeboard, where the alternative would be for survivors to jump into the raft from considerable heights, or to descend ladders. In either case, the possibility of a fall, which could cause injury, and of immersion in the water, with its associated risk of hypothermia, is greatly increased.

The RFD Surviva liferaft range introduced earlier this year is said to be the only liferaft specifically designed to meet the higher stan-



dards of performance and construction laid down in the 1983 SOLAS Amendments.

Built from a recently developed material that is more hard-wearing than any previously used in liferaft construction, the Surviva line incorporates a number of significant safety features. These include newly designed water pockets and sea anchor for improved stability; a lower-profile canopy, which gives better performance in strong winds and enhances stability still further; and a new light, powered by a dry cell battery,

that has greater visibility and a longer life.

The Surviva DL will be backed by RFD's strong commitment to after-sales product support. The company has built a network of more than 230 service stations situated in major ports throughout the world. These are gearing up to meet the servicing requirements of the company's entire product line, including mandatory inspections.

For additional information and free literature on RFD liferafts,

Circle 40 on Reader Service Card

Dyvi Heavy Lift Vessel Busy Transporting Semisubmersibles



The rig transporter vessel Ferncarrier (shown above), operated by Dyvi Heavy Lift of Oslo, recently completed her fourth transport of a semisubmersible drilling unit, the Penrod 73, from California to the Gulf of Mexico via the Strait of Magellan.

This latest voyage took just over 42 days, discounting the time taken to land a sick riding crew member in Chile, for a total average speed of 13.6 knots. Daily averages as high as 17.6 knots were logged. This is the second such voyage from the U.S. West Coast to the Gulf of Mexico, following two transports from Korea to the North Sea in 1983.

Following the delivery of the Penrod 73, the Ferncarrier left immediately for Japan to pick up the big semisubmersible Dyvi/Stena, owned by Stena and built by Mitsubishi's Hiroshima yard, for delivery to the North Sea. That voyage is expected to take about 34 days via the Suez Canal.

Circle 43 on Reader Service Card

Harbormaster Offers Literature On Fixed-Pitch Tunnel Thrusters

Literature on fixed-pitch tunnel thrusters is available free from Harbormaster of Quincy, Mass., Division of Mathewson Corporation.

The thruster is handsomely illustrated on the cover of the publication, which also gives important data in chart form on the various models along with a diagram and informative text.

For a free copy of the literature and further information on Harbormaster thrusters,

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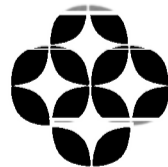
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