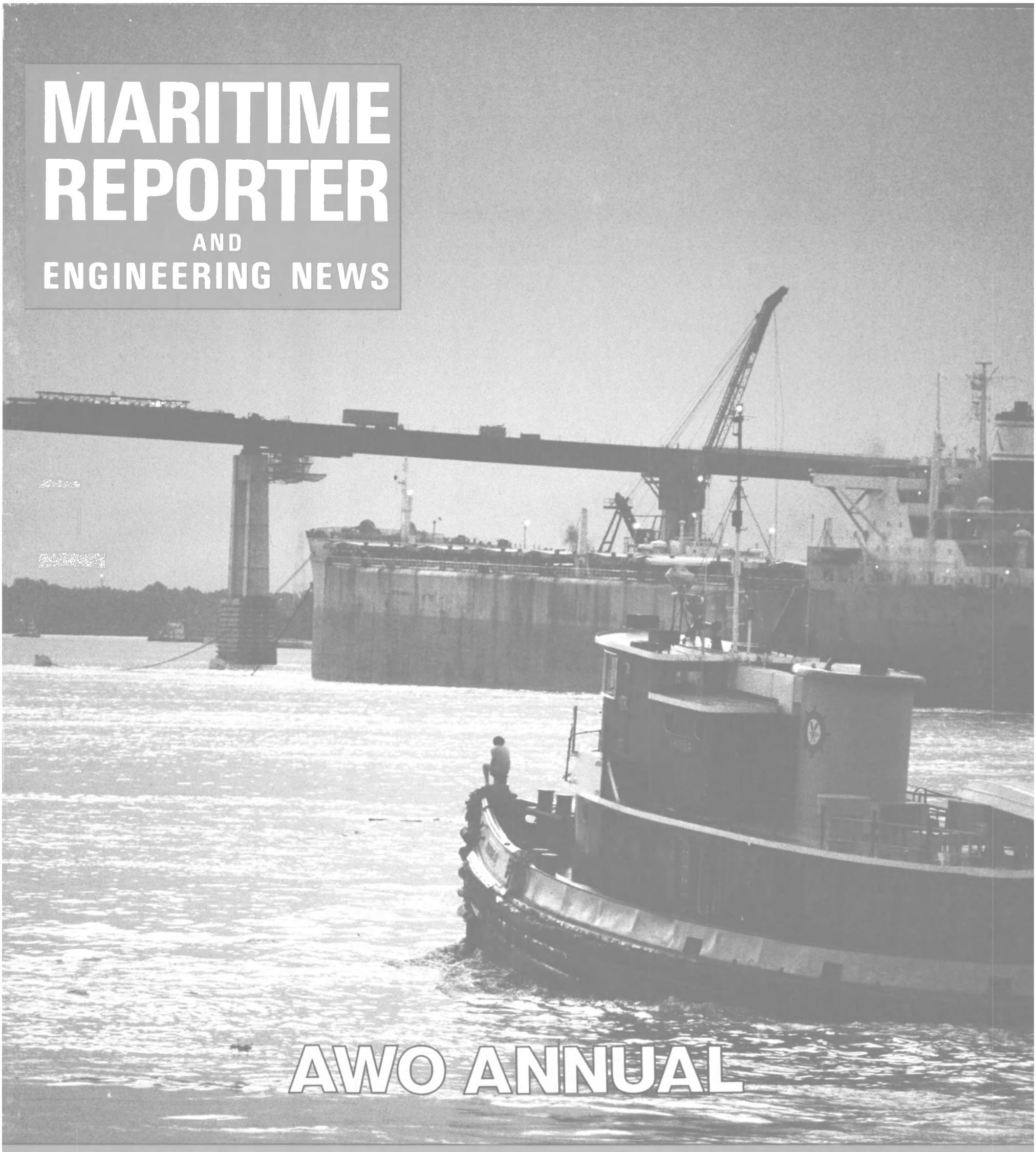
MARITIME
REPORTER
AND
ENGINEERING NEWS



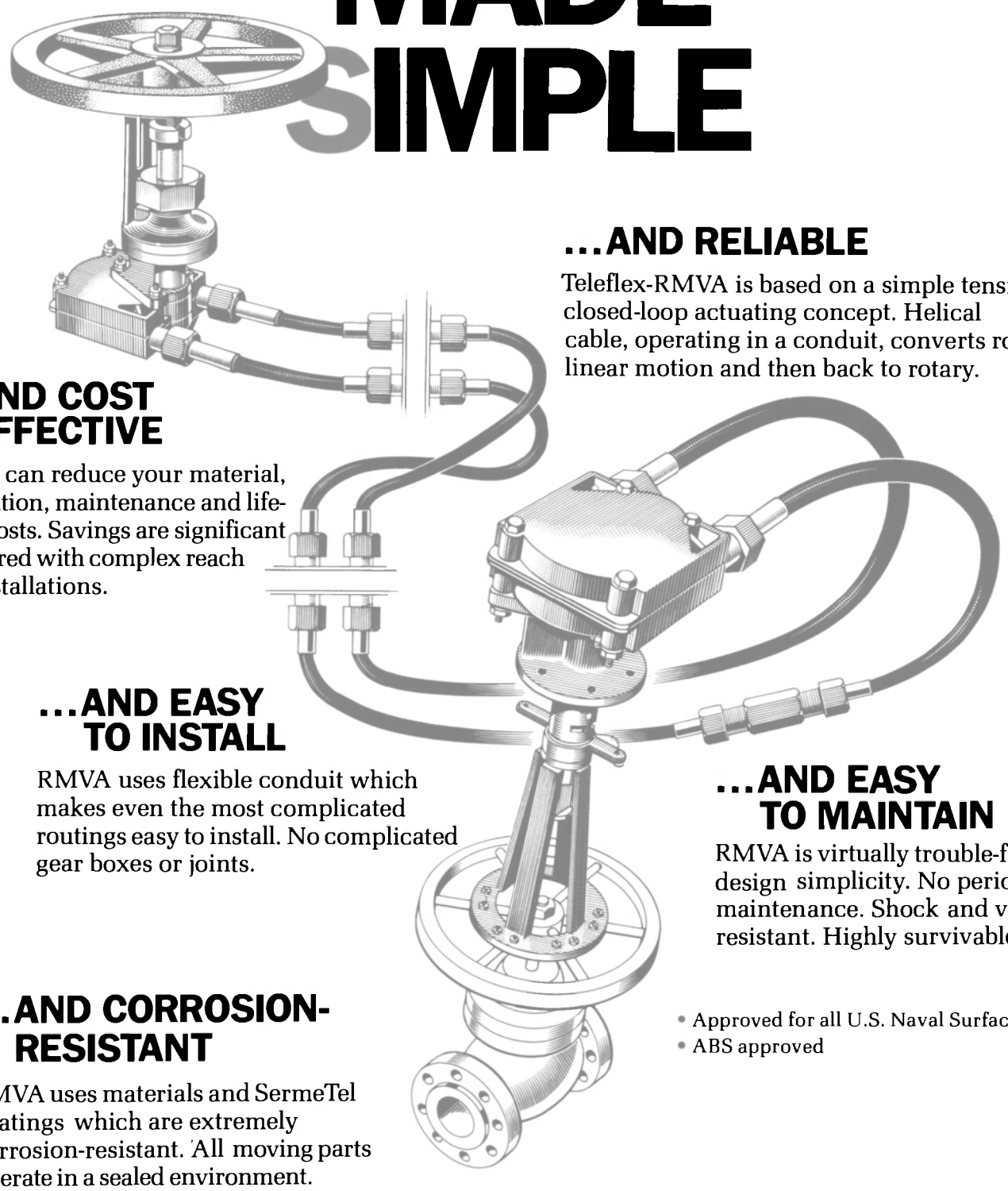
AWO ANNUAL

NAVAL TECHNOLOGY & SHIPBUILDING

Navigation/Communications Equipment Review

MARCH 1988

REMOTE VALVE ACTUATION MADE SIMPLE



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...AND COST EFFECTIVE

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...AND EASY TO MAINTAIN

RMVA is virtually trouble-free, due to design simplicity. No periodic maintenance. Shock and vibration resistant. Highly survivable.

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The Teleflex Remote Mechanical Valve Actuator (RMVA) has proven its dependability in cruel environments aboard naval vessels.

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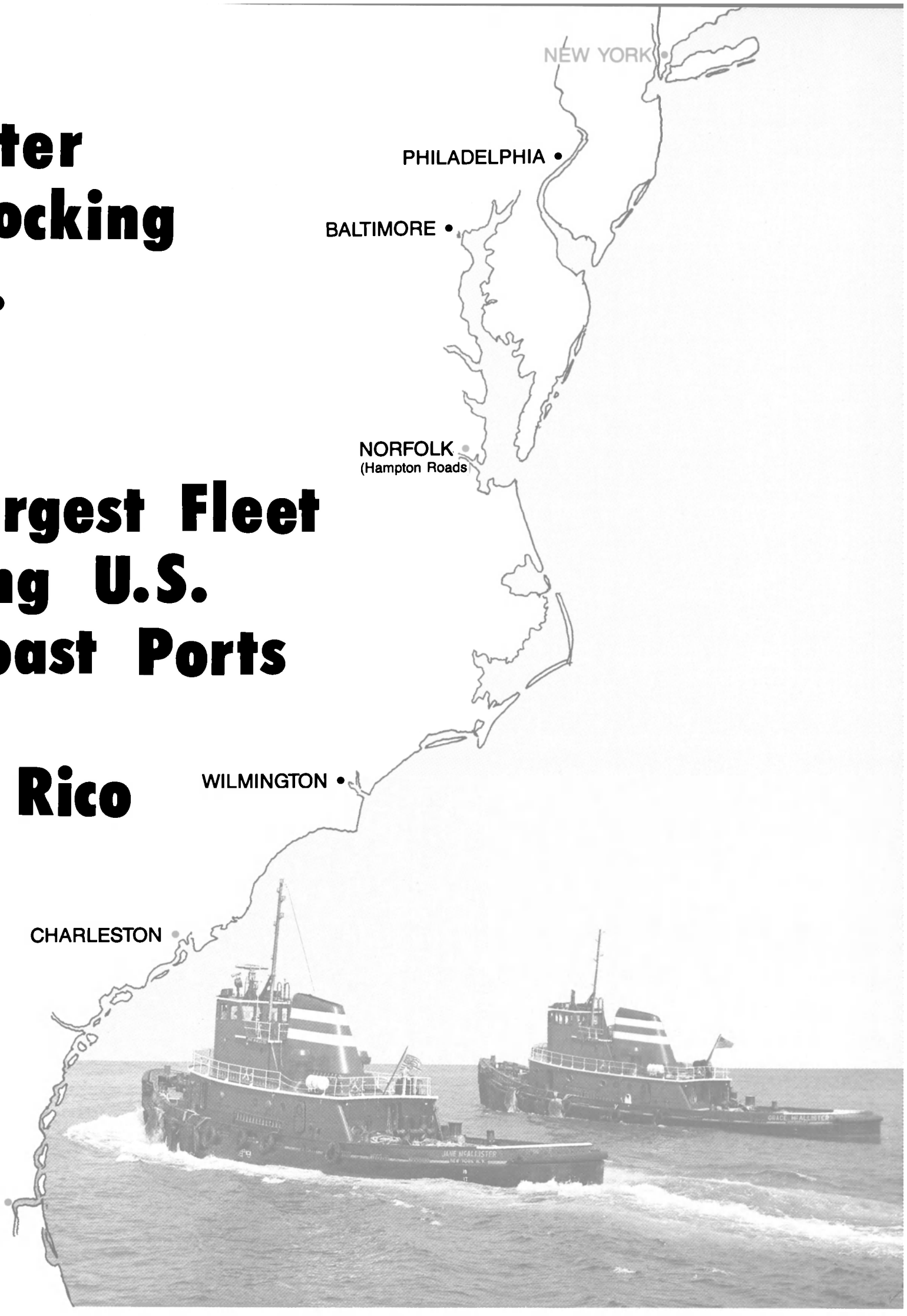

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ON THE COVER

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Equipment Review
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FIRST A.W.O. ANNUAL ISSUE

This March 1988 issue marks a milestone in the publishing history of MARITIME REPORTER/Engineering News. It is the first A.W.O. ANNUAL to be published by MARITIME REPORTER and it establishes March as A.W.O. month. Every year from 1988 on, the March issue will be the A.W.O. ANNUAL.

This annual issue decision was reached with the full cooperation and support of the American Waterways Operators, Inc. Much of the editorial content was contributed by A.W.O.

Truly national in scope, the American Waterways Operators, Inc., is the most prominent and influential industry organization throughout the entire U.S. shallow-draft sector—both coastal and inland.

A.W.O. membership, including shipyards and vessel operators, now numbers over 300 companies, of which 200 are leading vessel operators with fleets totaling more than 5,500 tugs and towboats and more than 32,000 barges.

MARITIME REPORTER is proud to be associated with A.W.O. in any effort to support the health and growth of the vast and vitally important coastal shallow-draft and inland sectors of the U.S. marine industry.

Newport News To Perform $11.2-Million Sub Refit

Newport News Shipbuilding & Drydock Co., Newport News, Va., has been awarded a $11,172,200 contract for an extended refit period for the submarine SSBN-654 by the Naval Sea Systems Command. The work, which will be performed in Holy Loch, Scotland, will be completed in October 1988. The contract is N00024-88-C-2098.

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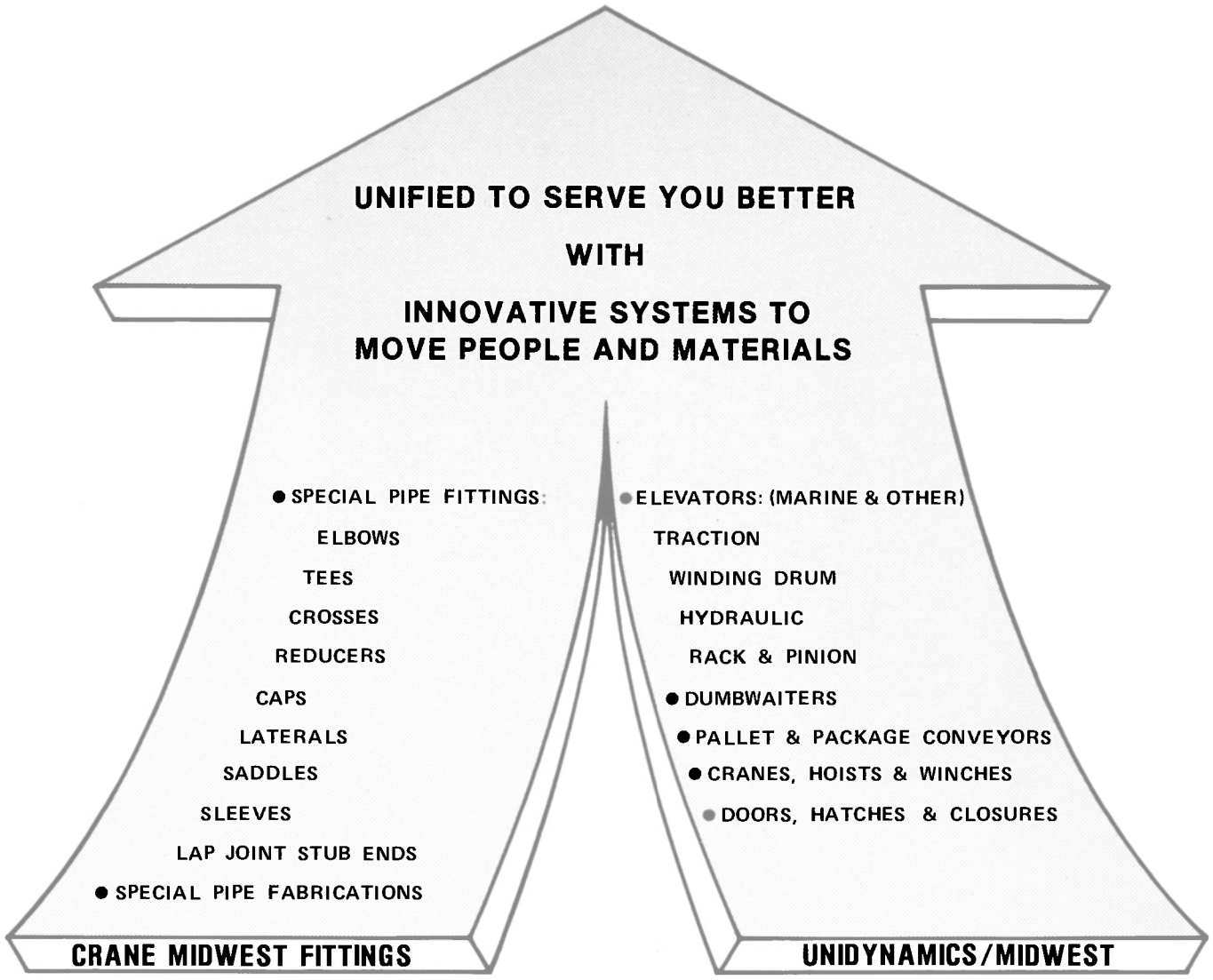
INTRODUCING . . . .

CRANE MIDWEST



THE ESTABLISHMENT OF **CRANE MIDWEST** REFLECTS THE CONTINUATION OF THE UPPERMOST COMMITMENT OF CRANE DEFENSE AND SPECIALTY SYSTEMS TO SERVICE OUR CUSTOMERS. CONSOLIDATION OF ONE OF THE OLDEST PIPE FITTING MANUFACTURERS - CRANE MIDWEST FITTINGS - AND THE DOMINANT SUPPLIER OF MARINE ELEVATORS AND ENGINEERED SYSTEMS - UNIDYNAMICS/MIDWEST - INTO A UNIFIED **CRANE MIDWEST** WILL STRENGTHEN THIS COMMITMENT.

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Crane Consolidates Two Business Units To Form Crane Midwest

Crane Company, Defense and Specialty Systems Group, St. Louis, Mo., recently announced the consolidation of two of its business units, Crane Midwest Fittings and Unidynamics/Midwest, to form Crane Midwest.

Crane Midwest will continue to maintain the product lines of both business units and will position itself to continue to serve the oil and gas, power generation and shipbuilding industries.

Crane Midwest Fittings is the leading producer of special buttweld fittings and fabrications in carbonsteel, intermediate alloys, low temperature, hi-yield, stainless and inconel. Crane has been a major supplier of critical welding fittings for the U.S. Navy Nuclear Propulsion Program. Crane fittings, produced under highly specialized manufacturing and quality assurance programs, are supplied for oil and gas transmission lines and high pressure power generating stations.

Unidynamics/Midwest designs and produces engineered systems and components for military and commercial markets. This unit is a major supplier of marine elevators, vertical package conveyors, bridge cranes, hoists, davits, winches, doors, closures and marine handling systems. Special commercial elevators are supplied to the power generation and TV/FM broadcasting industries.

For more information and free brochures outlining the full product line of Crane Midwest,

Circle 84 on Reader Service Card

Unitor Ships Service Acquires Gamlen Marine

Norwegian-based Unitor Ships Service AS recently acquired the Gamlen Marine Chemicals activity of Sybron Chemicals Inc., Birmingham, N.J.

Gamlen Marine Chemicals, one of Unitor's competitors, has a worldwide network for distribution and sale of marine chemicals and services. Gamlen Marine is one of the leading suppliers in this field and has gained special recognition for its cleaning and maintenance chemicals.

The purchase of Gamlen Marine is a strategic investment for Unitor. It means a major strengthening of Unitor's competitiveness through an expanded product range, improved product availability and a major reinforcement of expertise within the chemical sector—both at headquarters and in the sales network. The acquisition is expected to contribute to further improvement of Unitor's results during 1988.

Unitor already possesses a strong marine chemical activity through its Perolin Marine operation. Together with Gamlen Marine, this operation will now be integrated into Unitor Marine Chemicals as a separate division. Its headquarters will continue to be located at Rickmansworth outside London. The product lines of both Perolin and Gamlen Marine will be integrated into one common line containing the best products from both ranges.

For additional information and free literature on Unitor,

Circle 9 on Reader Service Card

Verdon To Head New U.S. Shipowners Group

William P. Verdon has been named the new president of the United Shipowners of America (USA), a newly formed group of U.S. shipowners which will press for legislative and regulatory changes that will strengthen the U.S. merchant marine.

In his new position, Mr. **Verdon,** former vice president and general counsel for U.S. Lines, will serve as full-time chief executive officer of USA, and will spearhead the Washington, D.C.-based group's efforts to develop and advocate constructive legislation and regulations on behalf of its members.

USA's membership includes American President Lines, Crowley Maritime Corp., Farrell Lines, Lykes Bros. Steamship Co. and Sea-Land Service.

Racal Wins Major Radar Order From Midland Enterprises

Racal Marine, Inc., Cranford, N.J., has been awarded contracts from Midland Enterprises, Inc. for color radar systems for riverboats. Midland Enterprises, Inc., headquartered in Cincinnati, is one of the country's largest river transport companies, providing service through its operating subsidiaries, the Ohio River Company, Orgulf Transport Company, Chotin Transportation, Inc., and Red Circle Transport Company. The order was obtained by Racal in conjunction with DeHart Marine, Inc., a Racal Marine dealer located in Memphis, Tenn.

The contracts call for a total of 69 Racal bright track radars to refit Midland's fleet of riverboats. Radar models 2070BT, 2090BT and RM970A BT will be provided. According to **Adrian Day,** president of Racal Marine, the Racal 2070 radar, with its high picture quality and use of color, is especially attractive for river applications. Speed, clarity and accuracy of the display provide superior navigation and safety on congested waterways.

Racal won the order following operational trials in 1987. Initially, several Racal 2070BT radars were installed on riverboats for evaluation by Midland. The 2070 is a 20-inch diagonal color rasterscan radar that allows quick recognition and evaluation of collision threats, clutter suppression and flexible day/night viewing modes. The production units for Midland will include display off-centering. Delivery and installation will be completed in the next few months.

Steve Frasher, vice president of operations, Midland Enterprises, Inc., said, "As a major fleet operator, we are pleased with Racal equipment and the support of both Racal and DeHart Marine. The unique conditions and economics of riverboat transport require optimal performance of the radar, coupled with minimum downtime and responsive service."

For free literature completely describing the Racal Marine radar line,

Circle 97 on Reader Service Card

Fort Schuyler Forum To Be Held March 16

The Society of Marine Port Engineers, New York, N.Y., Inc. will hold its Fort Schuyler Forum on Wednesday, March 16, 1988. This will be the 36th time the forum will be held at the SUNY Maritime College campus, located in the Throgs Neck section of the Bronx, New York City. The theme of the forum will be "Corrosion Materials and Material Protection." Featured will be the presentation of five papers.

Registration for the forum will start at 9 a.m. in the lobby of Marvin-Tode Hall, the college's Science and Engineering building. After the formal introduction by **Jack Nichols**, president of the Society, and welcoming by Admiral **Floyd Miller**, president of Maritime College, the forum will commence the morning session with a paper entitled "Principles of Corrosion," by Adjunct Assistant Professor of Chemistry **Garrick E. Louis** of the Maritime College. This will be followed by a presentation of "Corrosion Resistant Metals for Marine Applications," by **R. W. (Bud) Ross** of Nickel Development Institute. The third morning presentation will be "The Five Year Dry Dock and Electrochemical Control," by **Paul Byrne** of Electrocatalytic, Inc.

The afternoon session, following lunch, will feature two technical papers: "Soft Coating Ballast Tank Corrosion Protection," by **William F. O'Brien Jr.**, P.E., and **Albert R. Nolan** of Drew Ameroid Marine Division of Ashland Chemical Company, and "Fiberglass Piping Systems for Marine Applications," by **Hector G. Ballester** of Ameron Fiberglass Pipe Group. After the forum closing, an attendees social function is scheduled.

For more information on the 36th Annual Fort Schuyler Forum, contact The Society of Marine Port Engineers, New York, N.Y., Inc. at (212) 269-4840.

Racal To Demonstrate New Color ARPA At Whitehall Club In New York City

Racal Marine, Inc., Cranford, N.J., will be exhibiting several new products at New York's Whitehall Club, 17 Battery Place, New York, N.Y., on April 12-14, 1988.

The maritime industry will be especially interested in Racal's color rasterscan radars. In addition to the company's established 14- and 20-inch Bright Track displays, the new Racal 2690BT 26-inch true-motion ARPA color radar will be shown. Ideally suited for deepsea vessels, the 2690BT reduces the workload and stress on a bridge, making a major contribution to safety at sea. Racal stated that the unit is the world's first production color ARPA providing a 16-inch PPI equivalent scan on a 26-inch diagonal TV-type display.

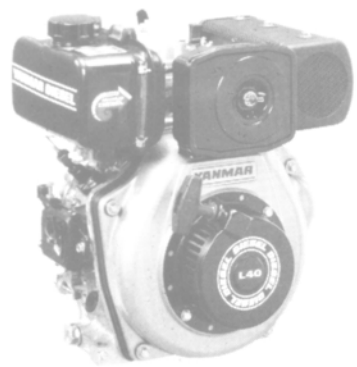
The exhibition will also feature the new MK53 Decca navigator, which is a direct replacement for the MK21, and the MNS2000 four-in-one navigation system that accepts decca, loran, satnav and omega signals.

For further information on attending this demonstration or for literature on the new color ARPA, contact: **Adrian Day**, Racal Marine, Inc., 70 Jackson Drive, Cranford, N.J. 07016; telephone: (201) 272-4222.

Alan Barich Appointed General Manager of Imo's Enterprise Engine Division

Alan C. Barich has been appointed general manager of Imo Delaval Inc.'s Enterprise Engine Division, it was recently announced by **Clinton S. Mathews,** group vice president of the company. Mr. **Barich** succeeds Mr. **Mathews,** who had served as general manager of the Oakland, Calif.-based division until his recent appointment to the Imo corporate staff.

New Diesel Pump Company Formed —Literature Available



The air-cooled Yanmar L-40 diesel engine is used to drive most of Diesel America's lightweight diesel pumps.

A Harahan, La., distributor of Yanmar diesel engines recently announced the formation of a new company, Diesel America, Inc., offering a full line of new lightweight diesel pumps.

Diesel America offers a full range of diesel pumps including centrifugal, trash, diaphragm and chemical units in two and three-inch sizes. The company also handles special-purpose, larger diesel-driven pumps.

In addition, Diesel America has a pump rebuilding program and also has developed a repower kit for companies with their own pump rebuilding programs.

The air-cooled Yanmar L-40 is used on most of the firm's pumps.

The owner and president of Diesel America, Inc., **Mich Wittich,** said, "We believe we have developed a series of lightweight pumps which will have significant impact on the inland waterway industry and others using portable pumps."

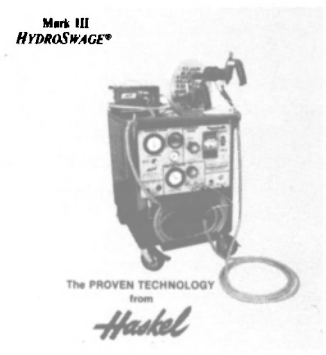
For free literature on the new line of lightweight diesel pumps from Diesel America,

Circle 96 on Reader Service Card

Substantial Savings Realized With HydroSwage MK III Tube Expander

—Literature Available—

Torque & Tension Equipment, Inc., of Santa Clara, Calif., recently announced a dramatic improvement and cost savings for expanding the ¼-inch, ⅜-inch, and ⅝-inch tubes for coolers, condensers, and heat exchangers on surface ships by using the MKIII HydroSwage Tube Expander from Haskel, Inc. Utilizing precisely controlled uniform hydraulic water pressure between two seals, this method is safe, fast, and economical. The MKIII HydroSwage Tube Expander, which recently was approved for use by NAVSEA for both new and retubing applications, can dramatically cut tooling costs associated with tube rollers for these applications.



The MKIII HydroSwage Tube Expander, with digital pressure readout and control capabilities, is the result of 16 years' experience with hydraulic expansion techniques for expanding tubes into a tubesheet by applying uniform controlled water pressure in the tube ends. The pressure, or expansion force, is accurately set, measured, repeated, and controlled. This produces a better job in addition to being more cost effective.

HydroSwage tube expanding normally takes place in two quick steps. First, the tubes are locked or set into their axial position. Secondly, in a matter of seconds, high pressure water is applied in the tube ends resulting in a leak-tight expansion. When doing the job right the first time at substantial savings is a valid concern, the manufacturer states, the alternative to tube rolling is the Haskel MKIII HydroSwage Tube Expander.

For further information and free literature from Torque & Tension Equipment,

Circle 100 on Reader Service Card

Slingmax Rigging Products Offers Literature On New Load-Lifting Equipment

Slingmax Rigging Products, Aston, Pa., has added Twin-Path Extra™ Slings to their product line, according to **Dennis St. Germain,** president of the company. The company already markets the innovative Twin-Path™ Lifting Sling line.

The new sling product consists of two complete slings in one, each making separate connections between hook and load, with double-layered covers for extra protection. This back-up system helps maintain control of the load should damage occur. The double-layered, color-coded covers make for easy inspection.

The shape of the Twin-Path Extra Sling easily adapts to fit both hooks and shackles that might be too small for other slings and gives the widest possible bearing contact with the load. Beside their flexibility, the slings are extremely light and strong.

Slingmax Twin-Path Extra Lifting Slings are represented in Canada by Strider-Resource, with agreements pending in Europe and Asia.

For detailed information on Slingmax Rigging Products,

Circle 88 on Reader Service Card

Bethlehem Steel Plans Sales of Shipyards In Texas & Singapore

Bethlehem Steel Corporation recently announced plans to sell three of its shipyards and consolidate its shipbuilding operations at Sparrows Point, Md.

According to **Walter P. Williams,** chairman and chief executive officer of Bethlehem Steel, the firm plans to sell its yards in Singapore and Beaumont and Port Arthur, Texas. The company will use its Sparrows Point facility to market and produce offshore drilling platforms, ships and other marine products, as well as to perform ship repair, conversions and modifications.

At present, the Bethlehem Steel-Sparrows Point yard is constructing two oceanographic survey ships for the Navy under a $130-million contract.

The pushboat Valvoline, sister vessel of the recently delivered SuperAmerica, shown in operation near New Orleans. Both pushboats were built by Quality Shipyards for Ashland Oil Co. as part of a series.

Quality Shipyards Delivers Third Pushboat In Series of Three To Ashland Oil Company

Quality Shipyards, Houma, La., recently delivered the 4,200-hp pushboat SuperAmerica, the third in a series of three new vessels built for Ashland Oil, Lexington, Ky. The three pushboats replaced towboats that were all more than 40 years old.

Ashland invested about $3.5 million for each boat to modernize its fleet. Ashland already operates the largest fleet of tank barges on the inland waterways.

The SuperAmerica has an overall length of 150 feet and breadth of 45 feet and has accommodations for 17. Her normal crew complement is 10.

The 4,200-hp inland towboat is powered by a pair of Caterpillar 3606 diesel engines. The Cat 3606 is one of a series of new large displacement engines that are offered in six, eight, or 12-cylinder versions. Designed to operate on number two or heavier grade fuel oil, the 3606s are making their new boat debut in the SuperAmerica and her sister vessels, the Valvoline and Paul B. Blazer. Intake air for the two main engines is filtered by high-efficiency Amer-Kleen filters.

Two 155-kw generators, each powered by a Caterpillar 3306TA, insure ample electronical power for the boat.

The rest of the drive package consists of Falk 24MR40 reduction gears with a ratio 4.48:1 turning 105-inch Columbian Bronze five-bladed propellers. For added low-speed power, the propellers are fitted with Kort nozzles.

Some of the navigation and communications equipment featured are the SuperAmerica includes two Standard Horizon VHF radios, a Motorola SSB radio, two Sperry Marine radars, and an Elac depth sounder.

The SuperAmerica has impressive tank capacities, holding about 100,000 gallons of fuel oil, 10,000 gallons of potable water, 10,000 gallons of wash water, 3,000 gallons of lube oil and 30,000 gallons of ballast water.

The SuperAmerica along with her sister ships, the Valvoline and the Paul G. Blazer, should help Ashland Oil meet their customer demands in a very competitive market.

For free literature detailing the boatbuilding facilities of Quality Shipyards,

Circle 64 on Reader Service Card

SUPERAMERICA
Equipment List

Main engines (2)	Caterpillar
Generator engines	Caterpillar
Propellers	Columbian Bronze
Reduction gears	Falk
Steering system	Skipper Hydraulics
VHF radios	Standard
Radars	Sperry
SSB radio	Motorola
Depth sounder	Elac
Deck winches	Nabrico
Fuel purifier	Alfa-Laval
Search lights	Carlisle & Finch
Airhorns	Kahlenberg
Fuel meters	Tokheim
A/C	Carrier
Fire detectors	EMI

Centrico Offers Advanced Oil Purifying Equipment —Brochure Available

Centrico, Inc. offers state-of-the-art equipment for cleaning even the lowest grades of fuel and lube oil.

Two technologically advanced units offered by Centrico are the self-cleaning Westfalia OSA-type oil purifier and the VESA-EC-2 precision timing and monitoring device. OSA-type oil purifiers are widely used in shipboard applications for the purification of fuel and lube oils. Centrico offers a number of OSA centrifugal purifier models which remove impurities from heavy oils at rates ranging from 350 to 6,075 gph.

The VESA-EC-2 automatic timing unit is designed to control and monitor OSA-type centrifuges when purifying high-density oils. This VESA unit, coupled with Westfalia's latest self-cleaning centrifuges, offers the optimum in technology for fully automatic, two-stage treatment of heavy fuel oil with densities up to 1.01 g/ml.

Westfalia oil-purifying centrifuges offer efficient utilization of heavy oils as well as improvement of engine performance, reduction of engine wear and breakdowns and the lengthening of lube oil life.

For a free brochure on Centrico's Westfalia OSA-type oil purifier and the VESA-EC-2 precision timing and monitoring unit,

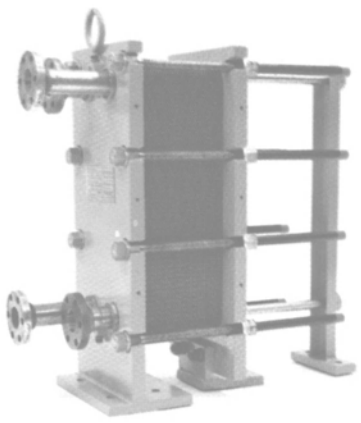
Circle 89 on Reader Service Card

Alfa-Laval Offers Quality Plate Heat Exchangers For Navy Shipboard Cooling Duties

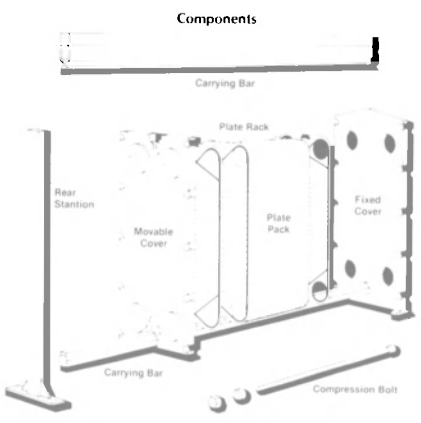
—Free Color Brochures Available—

Alfa-Laval, Inc., Ft. Lee, N.J., is offering three color brochures and one technical paper detailing the relative economic and performance advantages of their marine plate heat exchangers.

These reports explain that Plate Heat Exchangers (PHE) and Shell and Tube Heat Exchangers (S&T) have been used for many Navy and commercial marine shipboard cooling duties. However, certain features of the PHE can make it a more viable alternative than S&T coolers.



This Alfa-Laval model P2-MH plate heat exchanger is being used aboard a U.S. Navy combatant vessel for cooling demineralized water of electronic equipment.



Drawing showing the components of Alfa-Laval's plate heat exchanger.

Alfa-Laval offers a full line of PHEs which have been in service worldwide with most shipping concerns for over 25 years. Since their introduction, more than 7,500 units have been put into marine service.

The company's PHE consists of a plate pack and a frame. The frame consists of a fixed plate to which all pipes are connected. An upper and lower carrying bar are supported by an outrigger or support column. The plate pack is suspended from the upper carrying bar and is clamped together by compression bolts.

The plate packs are pressed from titanium for seawater service and stainless steel for freshwater service. The unit is normally installed by deck mounting but can be mounted in other configurations as well.

PHEs that are supplied to the U.S. Navy have met extensive requirements for shock and vibration.

According to Alfa-Laval, the alternating titanium plate and gasket design used in the configuration of PHEs prevents interleakage of the two fluids and allows the use of considerably higher liquid velocities without erosion. The corrugated Chevron design of the plates also gives the unit a considerably higher heat transfer coefficient and, therefore, requires less cooling water flows.

The company reports that PHEs have proven to be easily maintainable both in port and at sea. No special tools are required to disassemble, inspect and clean the unit.

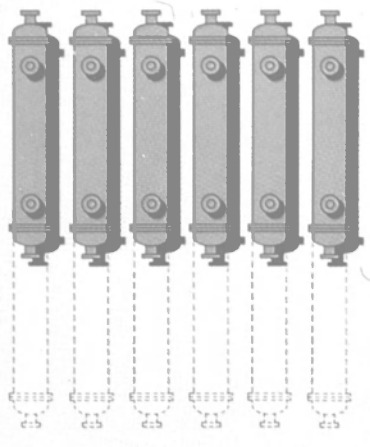
The PHE offers excellent performance in close temperature approaches or hard-to-perform thermal duties such as cooling a liquid down to 100 degrees F when using 95 degree seawater. On many of the test and evaluations ships, the reports indicated that for the first time in years, the cooling system was able to meet the performance requirements and be available for service 100 percent of the time.

Light in weight and innovative in performance, the PHE lends itself to retrofitting, as the unit can be disassembled dockside into its component parts, hand-carried to the location of installation and reinstalled by the ship's force, eliminating the need for cranes, or removal of other equipment so that the exchanger can be put into place.

One of the most impressive features of the PHE is its ability to be modified in the field to compensate for changes in the thermal duty. A PHE can be expanded merely by adding plates, changing the plates, or, in the other extreme, by taking plates out.

(continued)

Space and weight comparison—PHEs vs. S&Ts for identical duties



Space and weight required for plate heat exchangers vs. shell and tube units for identical duties in an offshore platform application

	PHE	S&T
Total weight, drained, tons	16	96
Total weight, operating, tons	19	136
Floor area, installation, ft²	150	1130
Floor area, installation and maintenance, ft²	225	2045
Heat load per unit, million BTU/hr	45	30
Number of units	4	6

Alfa Laval

(continued)

For U.S. Navy combatant vessels, the Alfa-Laval plate heat exchanger has met and passed the requirements of both MIL-STD-167-1 vibration and MIL-STD-901C shock for Grade A, Class 1, hull-mounted machinery.

Applications from 0-1,000 gpm include seawater to fresh water, seawater to oil, and fresh water to fresh water.

Alfa-Laval is offering free color brochures on their line of marine plate heat exchangers. Through the use of color photographs, drawings, tables and explanatory text, the brochures fully detail the features and advantages of Alfa-Laval PHEs. For your free copies,

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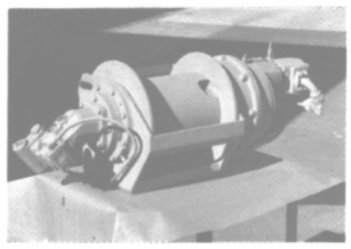
Constant-Tension Winch For Handling Rescue Boats Offered By Braden

The Braden Model PD12C-CT constant-tension davit winch and control system has been developed to reduce the risks involved when launching and recovering small boats over the side of a ship.

During a launching operation, slack cable is available automatically as soon as the boat rests on the water, allowing the cable to be pulled from the winch by hand. During a recovery operation, as the boat rises and falls on the waves, the davit-winch drum will yo-yo backwards and forwards, maintaining tension on the cable until the operator is ready to hoist the boat from the crest of a wave. This prevents the boat from being buffeted by the waves and avoids most of the shock loads that occur when a conventional davit winch is used. All control functions for the winch are provided by a single control lever.



The Braden Model PD12C-CT constant-tension winch for handling rescue boats.

The winch is designed to meet SOLAS requirements for factors of safety, brake capacity and gravity lowering, etc. Provision can be made for hoisting by means of a hand crank where required.

The winch is rated at 6,500 pounds line pull at speeds up to 200 fpm based on 2,200 psi and 54 gpm for the hoisting and lowering function. Line speeds in excess of 560 fpm can be provided with cable tension between 150-400 pounds depending on cable speed and direction in the constant-tension mode.

For more information and free literature on Model PD12C-CT constant-tension davit winch from Braden,

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New Wooster Catalog Lists Anti-Slip Safety Stair/Walkway Products

Wooster Products Inc. of Wooster, Ohio, recently published a 20-page catalog on the anti-slip safety stair and walkway products manufactured by the company.

Included in the three-hole-punch catalog are Spectra® safety treads, specified for best architectural aesthetics, heavy pedestrian traffic use, matching or contrasting color decor, indoor, outdoor use; Supergrit® safety treads, specified for heavy pedestrian traffic use, excellent safety protection at low cost, indoor, outdoor installation, new construction or renovation; abrasive cast safety treads and nosings, structural treads and platforms, thresholds, specified for maximum durability in rough use, indoor or outdoor, resistance to unusual corrosive environments, new constructions or renovation; safety resurfacer, paint, press down treads, specified for loading docks, aisleways, ramps, corridors, kitchens, showers, work areas, ladders, steps and rolling equipment.

Also included is a section giving installation tips and types of fasteners available, and installation details for Wooster safety treads.

For more information and a free copy of the catalog from Wooster Products,

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AWO

Harriet Harrison New Chairman Of AWO Southern Region

Harriet Harrison

The American Waterways Operators (AWO) recently announced the election of **Harriet Harrison** as chairman of the association's Southern Region.

Mrs. **Harrison** is the first woman to ever be elected chairman of any of AWO's five regions. The fact that the southern region which consists of waterways in Louisiana, Texas, Mississippi, Oklahoma, Georgia, Alabama, Arkansas, Tennessee and Florida has the largest membership of any region, gives the chairmanship that much more responsibility to supply the leadership for maritime concerns.

Mrs. **Harrison** follows in the footsteps of her father, **Harry Collins,** who was himself elected to the same AWO chairmanship in 1967. Mr. **Collins** is one of the only 25 people ever to be elected "Directors Emeritus" (member for life) in the history of AWO.

Previously Mrs. **Harrison** had been membership committee chairman of AWO and was instrumental in leading a highly successful membership drive. She was also the first woman to be elected a director in the southern region.

As president of Koch-Ellis Marine, long into ship bunkering and fuel and lubricant services, plus president of Koch-Ellis Barge & Ship Service, a cleaning, gas freeing, wet dock repair facility, Mrs. **Harrison** has always looked for innovative ways of improving the marine industry both in the New Orleans area and nationwide.

"Being elected chairman by my peers is a great honor," said Mrs. **Harrison.** Her first goal is to immediately create and establish legislative office committees with individual chairmen for each of the states in the southern region. This will help to monitor the activities of state legislations that affect the marine industry. "As an industry, we must become pro-active instead of reactive," said Mrs. **Harrison.**

Although she has already begun her duties, Mrs. **Harrison** will officially be acknowledged in April at the 1988 national AWO convention to be held in Washington, D.C.

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Tate Andale Offers Free 130-Page Catalog On Marine Products

The consolidation of Tate Temco, Elliot's Strainer Division, and Andale Pipeline Products into one company, Tate Andale, Inc. has led the way for the company's introduction of a new, free 130-page catalog detailing their full line of strainers, valves, valve actuators, heat exchangers and specialty products.

The catalog, which is bound into a handy three-ring, stain-resistant binder, is divided into seven main sections—"Strainers," "Valves," "Valve Actuators," "Heat Exchangers," "Specialty Products," "Manifold Valves" and "Technical Data"—which are in turn divided into subsections. The catalog provides a wealth of informative technical data on Tate Andale products through the use of black-and-white photographs, charts, tables and explanatory text.

There are over 35 different types of pipeline strainers described, covering a range of pipeline sizes up to 60 inches.

The free catalog also features Valvmatic Valve Actuators designed for automating hand-operated valves, oil coolers and heat exchangers, multi-circuit valves and Tate's line of specialty products for shipboard and general industrial use.

For your free copy of this limited-quantity catalog from Tate Andale,

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AWO ANNUAL

A truly national organization, AWO's 300-plus member companies are located along the banks of all major US waterways, and on the shores of the Atlantic, Pacific and Gulf Coasts

AWO: SAFEGUARDING THE BOTTOM LINE OF ITS MEMBER COMPANIES

The American Waterways Operators (AWO) is the only trade association representing the national interests of the domestic inland and coastal tug and barge industry. Since its incorporation in 1944, AWO has worked to help its members protect their operations' bottom lines by promoting both the industry's interest and its contribution to the American economy. Now, at the onset of the 1990s, AWO's membership includes active involvement by all segments of the inland and coastal barge and towing industry including carriers, tugboat and towboat operators and the shipyards that repair and build the industry's vessels.

Few can speak with more authority on AWO than its chairman of the board for 1987-88, Capt. **Arthur M. Knight,** executive director, Reinauer Companies, Inc.

"The privilege of being AWO's chairman of the board affords me the opportunity for a unique look at the Association. I cannot help but form impressions and judgments about AWO, and they are good impressions and positive judgments," Captain **Knight** says. "AWO is a truly remarkable organization, largely because of its remarkable people. Hardly any issue we tackle commands unanimous agreement. Yet, invariably, every issue draws a unanimous spirit to solve problems the best way we can. And, it is that spirit which takes us so far in accomplishment. AWO is small by trade association standards. Yet I marvel at how much we take on, and how successful we are," he says.

"How can an organization so small accomplish so much? I have concluded it is the people in AWO who make it all happen. As for the members, there is very heavy participation in AWO's work. For example: Two thirds of all our member companies are represented on committees or the board of directors; members of the executive committee make a minimum of six trips a year for meetings; the board meets three times a year; and something like 150 briefing papers reach members a year. That doesn't count the richly informative biweekly *AWO Letter.* Hundreds and hundreds of man hours are devoted to AWO by its members. And, of course, this is all on top of our primary responsibility to our own companies," he says.

Captain **Knight** also notes the role played by the Association's staff in AWO's success, stating that "In addition to the heavy participation of members, we are served by a superb staff—lean, energetic, tough and smart—who represent our interests with a commitment to professionalism and effectiveness for which our industry can be proud."

Joe Farrell, president of AWO since 1983, discusses the Association's continuing effectiveness, noting that "We have begun to string together the good years like pearls, emblematic of the valuable return for our members on their investment in the American Waterways Operators."

In discussing the challenges of the past year, Mr. **Farrell** notes that 1987 was especially demanding on the issue front. Moves by states to regulate marine vapor emissions, federal oil-spill legislation which exposes the industry to highly speculative damage claims, states seeking to replace lost federal dollars by imposing taxes on diesel fuel, misguided Coast Guard user taxes, an arrow fashioned in the Free Trade Agreement with Canada which was aimed at the heart of the Jones Act; these and many more, drew heavily on all of AWO's resources, he explains.

"But, we deployed these resources with enough care and skill to constitute considerable benefit for the industry, and we expect to continue to do so," he says.

In his "President's Report to the

Members" which appeared in the AWO 1987 *Annual Report,* Mr. **Farrell** remarks that AWO "... is strong, vigorous and streamlined. It is now a recognized leader in Washington. Our advice and assistance are sought by federal officials of all stripes, and by other collegial organizations, on issues affecting our industry, and even beyond. The Association has built a solid and enviable reputation. I submit to you that this reputation is a most precious asset which is made up of several parts: being well informed, reasonable, fiercely determined, imaginative and, most of all, possessing integrity. Now that we have such a reputation, we must preserve and protect it."

Echoing Mr. **Farrell's** sentiments is **Archie L. Wilson,** president-retired, of Dixie Carriers, Inc., Houston, Texas. Mr. **Wilson,** one of the true statesmen of the transportation industry, says that "The American Waterways Operators has, for many years, protected the interests of the inland and offshore marine industry, as well as shipyards serving those industries. In more recent years, during the depressed period in our industry, this protection of interests has been felt very strongly and has benefited AWO members and nonmembers alike. It is my firm belief that governmental agencies hold AWO in very high regard, and look to AWO for direction on all important issues affecting our industry. AWO does an outstanding job."

As a modern and effective trade association, AWO is a strong advocate for its member companies—endeavoring to promote, protect and defend the nation's tug and barge industry. AWO's central mission is to operate as a sharply informed and uniquely credible representative of the industry to the federal government, in the national media and, when appropriate, before the courts.

As the major representative of the national interests of this vital industry, AWO is charged with the responsibility not only of interpreting and monitoring events that will affect the Association's members, but also of anticipating critical developments and responding in a timely and effective way. AWO works to keep its members informed on Congressional and Administration actions that affect them, and interacts with the appropriate government entity to influence the legislative and regulatory proposals that matter to the industry.

As noted above, AWO actively manages issues that are aimed at safeguarding the bottom line of its member companies. For example, the Association directed its efforts in 1987 to successfully remove the maritime section from the U.S.-Canadian Free Trade Agreement; to promote legitimate expansion of the Jones Act beyond the three-mile limit to the 200-mile Exclusive Economic Zone; to prevent foreign building of sludge barges; to ban foreign conversions of U.S.-built vessels for the U.S. fishing industry, and to otherwise defeat assaults on the Jones Act. In addition, AWO worked to successfully defeat legislation that would establish Coast Guard User Fees, and worked to clarify and improve Coast Guard proposals regarding drug and alcohol use on commercial vessels. AWO is managing oil-spill liability, clean-up and compensation fund legislation toward federal preemption, reasonable liability limits and compensable damages. They proposed new benzene exposure standards for barges which provide protection to workers and maximum flexibility to vessel operators. And, AWO is presiding over an industry task force addressing the issue of vapor emissions from tank barges. They are also working to address the increasingly ominous spectre of state taxation of the barge industry.

Furthermore, as a critical adjunct to AWO's legislative and regulatory work, they stimulate the media to demonstrate the barge industry's vital role in the U.S. transportation economy, work to eradicate the wrongful "pork barrel" image that has plagued the industry, and emphasize both the industry's benefits for consumers and its role in U.S. national security.

AWO is working to focus federal government attention on the overcapacity in the industry, due largely to federal government actions; to seek modifications of lighting requirements on unmanned seagoing barges; to rationalize pilotage requirements for coastwise tank

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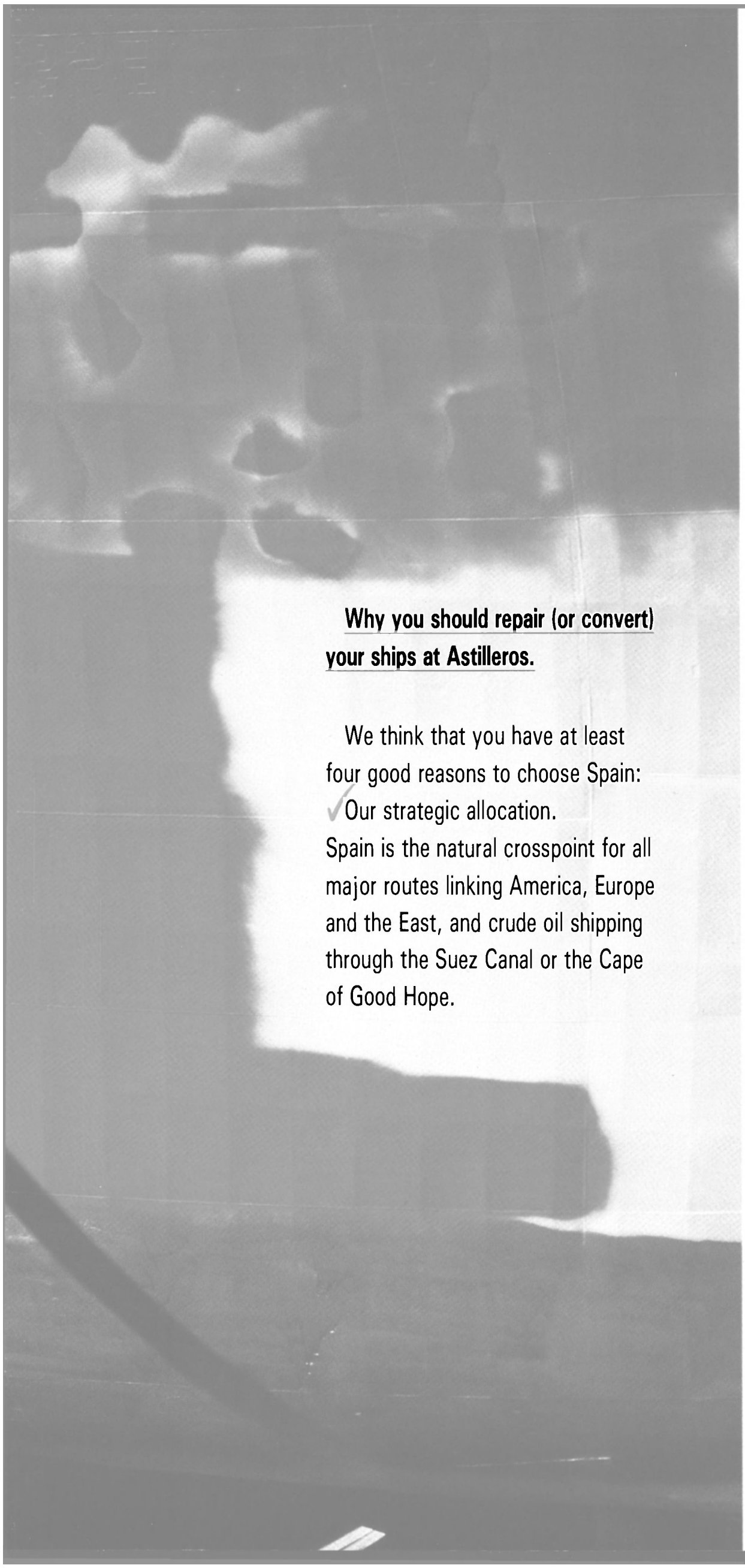

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(continued)

barges; to restore the full deductibility of crew meals provided on vessels; to eliminate state control of vessel air emissions from Clean Air Act reauthorization measures, and more.

The membership of AWO includes all segments of the inland and coastal barge and towing industry, including tugboats, towboats, barge operators and the shipyards that build and repair the industry's vessels. The Association's Affiliate membership is comprised of suppliers, manufacturers, insurers, bankers and other associations and businesses concerned with the marine industry.

Unquestionably, the American Waterways Operators is a truly *national* organization, with member companies located along the banks of all major U.S. inland waterways, and on the shores of the Atlantic, Pacific and Gulf Coasts, forming an extensive network of member companies involved in both their own local concerns, and in the current objectives and future direction of the industry nationally. Divided into five distinct geographic units, AWO's regional organization reaches individual members in the Pacific, Midwest, Southern, Ohio Valley, and Atlantic Regions.

Because of its nationwide regional structure, many problems can be solved by regional members working together on a local basis. Members in individual AWO regions meet regularly to voice the concerns from their particular area of the nation. At any given Pacific region meeting, a carrier member might share his concerns about transporting lumber on the Columbia-Snake River System. Or, a Midwest region grain carrier might work with his fellow members to resolve lock delays. Or, the Southern Region members might join together to fight a new state tax initiative. Or, the Ohio Valley Region might voice its collective concerns about waterway congestion. In another instance, Atlantic Region members might gather to address a petroleum shipping problem that affects transport from Maine to Florida.

The real strength, however, is that this diverse Association is ready and able to speak clearly and distinctly, with a strong, single voice when necessary—pulling together the differences which may occur between geographically based industry concerns.

AWO representatives in New York City, New Orleans, and Seattle provide regionalized membership services, help attract new members, organize regional meetings, and maintain a close working relationship with local officials and local offices of federal agencies, particularly the U.S. Coast Guard and the Corps of Engineers.

Complementing AWO's regional organization is its internal committee structure. AWO committees reflect the diversity of activities in which the Association is engaged—from highly technical navigation matters, to broad waterway policy issues. Member participation on committees affords employees of AWO member companies the opportunity to become actively involved in industry concerns. Each participant offers a high degree of interest in, and often technical knowledge of, particular issues facing the individual committees. These groups lend focus and direction to AWO's efforts, and provide the industry expertise necessary to make those efforts a success. AWO committees meet at least three times a year, and are often responsible for drafting, for board approval, industry positions on important issues.

William P. Morelli, Associate general counsel and director of government affairs, Midland Enterprises Inc., Cincinnati, Ohio, discussed the role and mission of AWO committees in an article that appeared in the August 28, 1987, *AWO Letter*. Mr. **Morelli,** who has served as AWO's Legislative Committee chairman for several years, writes that "I've had a chance to see how an involved membership can discuss, argue, debate, shape, and enhance AWO's legislative policy, and how it can have a strong impact on legislation which ultimately affects our industry . . . Through participation in committees, member companies can present their views in an open forum where their ideas share equal footing with all others. This is often the starting point in the development of AWO policy, and helps guide the executive committee, the board, and AWO staff in articulating AWO's position to official Washington."

Mr. **Morelli** goes on to define what he believes to be the most important aspect of committee work as "the ability for individual members through active participation in committee debate to have a real voice in creating AWO policy and influencing Congressional action."

He further explains another aspect of committee participation—which is often overlooked—but equally important to the Association members: education. "Because of their own job responsibilities many members cannot spend the time to digest all of the information which comes across their desk in the *AWO Letter*. They find that being able to immerse themselves in the information and briefings provided during committee meetings enables them to focus their attention on important issues," he writes.

The pundit who said "A camel is a race horse designed by a committee," obviously never attended an AWO committee meeting. The work is ongoing, hands-on, and specific. AWO committees provide the vehicle for member involvement in the issues that directly affect their company's future, and they do the essential work on matters that will ultimately affect their company's business position.

All in all, AWO is a modern, dynamic and effective trade association, that enjoys the deep participation of its members, has earned the respect of the nation's decision-makers, and is positioned to uniquely represent the interests—and the bottom line—of the tug and barge industry in the years ahead.

AWO'S REGULATORY ADVOCACY

by
Thomas A. Allegretti
Vice President-Operations
The American Waterways Operators

Thomas A. Allegretti

The AWO regulatory program has as its cardinal objective the promotion of a stable and reasoned regulatory environment for domestic marine transportation. The objective is best achieved through the Association's pursuit of compelling analysis and effective advocacy, which will nearly always converge to positively influence the substance and direction of Administration policies and agency proposals. Compelling analysis and effective advocacy are the two key ingredients to a consistently successful and productive government relations program. In large measure, they are most convincingly implemented when member guidance and participation is strong. Therefore, it is also a central goal of the regulatory program to maintain robust member involvement. AWO's regulatory program seeks to provide its members with the assurance that notwithstanding the issue, the Association can be relied upon to vigorously defend their interests, and ensure that regulatory requirements are both based on a genuine need and developed with a practical perspective.

In 1987, AWO continued to pursue the overriding goal of consistently effective advocacy with the Administration in behalf of the barge and towing industry. The objective of a stable and reasoned regulatory environment for domestic marine transportation was pursued via a vigilant watchstanding position that judges agency proposals on their demonstrated need and a vigorous approach which utilizes all the opportunities, from the apparent to the obscure, which the regulatory process offers. The fruits of this effort have thus far been substantial.

Foremost among AWO's activities with federal and state governments in 1987 was the Association's analysis and advocacy on the hydra-headed matter of marine vapor recovery requirements. The *AWO Task Force on Vapor Emissions* pursued a multi-faceted program designed to ensure that both government decision-makers and the barge industry fully understand the contribution which barge loadings make to the overall problem of hydrocarbon emissions, the increased safety risks which result from the utilization of vapor recovery equipment in marine loading applications, and the economic impact of vapor recovery requirements on barge operators. The AWO campaign was aimed at convincing state regulators not to move forward with vapor recovery regulations in the absence of federal safety standards. AWO also continued its effort to rectify the lack of federal leadership in the process of state regulation of hydrocarbon emissions from marine vessels.

The Task Force oversaw the development of analyses by a private research firm which produced important new information on the emissions role which barges and ships play and the substantial economic impact of vapor recovery requirements on independent barge operators. This information is critical in the decision-making processes of state governors and environmental regulators as they consider state regulation of marine emissions. The results of the analyses were also shared with the Marine Board Committee on the Control and Recovery of Hydrocarbon Vapors from Ships and Barges to assist that group in its assessment of the technical, safety, and economic aspects of control and recovery requirements.

The AWO analytical role is also being conducted within the Chemical Transportation Advisory Committee Subcommittee on Vapor Control, which is pursuing the development of industry recommendations to the Coast Guard regarding the technical components of a marine vapor control regulation which will establish uniform design criteria and minimum safety standards for these systems. *The Task Force on Vapor Emissions* is ensuring that barge interests are appropriately represented on the CTAC Subcommittee and that barge concerns are fully reflected in the evaluative process.

AWO has also used these analyses for advocacy; the work has been shared with Congressional participants in the ozone attainment debate and with the General Accounting Office which is conducting an analysis of the issue at the request of House Energy Committee Chairman **John D. Dingell** (D-MI). The analyses have been used in correspondence and discussions with EPA Administrator **Lee Thomas** and his principal air quality deputy in AWO's effort to have EPA assert a leadership role in guiding state activities on this issue.

The analyses have also been exceedingly useful in AWO's advocacy at the state level. Early in 1987, AWO contributed to a regulatory

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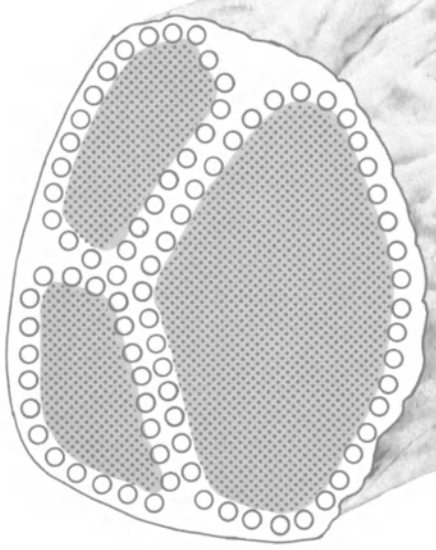

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process in the State of Illinois, which originally contemplated the regulation of marine vessels within nonattainment areas in that state. The compelling arguments presented by the barge industry resulted in a state decision not to regulate marine emissions at this time. A like effort was undertaken by AWO with the Bay Area Air Quality Management District in mid-1987, to halt premature attempts on the part of that body to impose marine vapor control requirements on vessels operating in the San Francisco Bay area. In 1987, Texas also adopted resolutions which indicate that it will not proceed with marine vapor control requirements at this time. Finally, the analyses have served as important information for an ongoing dialogue with high-ranking officials in the State of New Jersey, who are currently under court order to develop regulations that will reduce by 90 percent the hydrocarbon emissions from gasoline loading of barges at coastal refineries in New Jersey.

It is no overstatement to assert that without the focused leadership and concerted action of AWO members via the *Task Force on Vapor Emissions,* the developments in 1987 on this matter, both on the federal and state levels, are likely to have been certainly less reasoned and probably more onerous.

The subject of drug and alcohol abuse is one of high visibility and priority in the Reagan Administration. The manifestation of that policy for our industry is a Coast Guard proposal to establish regulations designed to monitor, control and reduce alcohol and drug use on vessels. AWO provided the Coast Guard with extensive commentary on such a program, expressing strong support for regulating intoxicant use, but taking exception to the mechanism proposed as too lenient to be effective and needlessly confusing.

The AWO analysis of the Coast Guard proposal uncovered a potentially disastrous effect it may have had on the longstanding corporate policies of many barge operators which prohibit the possession or consumption of alcohol aboard vessels. While the Coast Guard proposal did not purport to govern questions of possession or consumption, seeking instead to establish intoxication standards, there was nonetheless the clear potential that it could be read to implicitly encourage alcohol consumption aboard commercial vessels.

AWO undertook a campaign to unequivocally clarify that the federal intoxication standard is not meant to dilute or supplant existing corporate prohibitions. AWO pursued this question at high levels within the Department of Transportation, and in the media, to ensure that both its potential effect on the marine industry and its fuller impact on Reagan Administration policy could be fully understood. These efforts had the intended effect. A Final Rule on commercial vessel intoxication issued by the Coast Guard late in the year contains provisions, in the enduring form of regulation, which clarify that nothing in these federal standards shall be construed as limiting the authority of a marine employer to limit or prohibit the possession or use of alcohol on board a vessel. The barge industry applauds the Coast Guard's responsiveness and foresight in making these changes.

AWO moved aggressively early in 1987 to influence the implementation of Annex II of the International Convention for the Prevention of Pollution from Ships, 1973, to limit the harmful and unwarranted impacts of this regulation on the industry. AWO supported the pollution prevention goals which Annex II sought to achieve regarding the carriage of noxious liquid substances. However, the provisions of the regulation had the potential to inflict great harm on inland and coastal operations by applying design, equipment and operating requirements intended for foreign trading ships to domestic trading barges. The proposal would also have resulted in the wholesale movement of more than 60 cargoes now in Subchapter D to Subchapter O, without providing any evidence based on the toxicity or hazardous potential of these cargoes to support this movement. The AWO attempt to influence the regulatory implementation of Annex II was substantially compounded by the fast track

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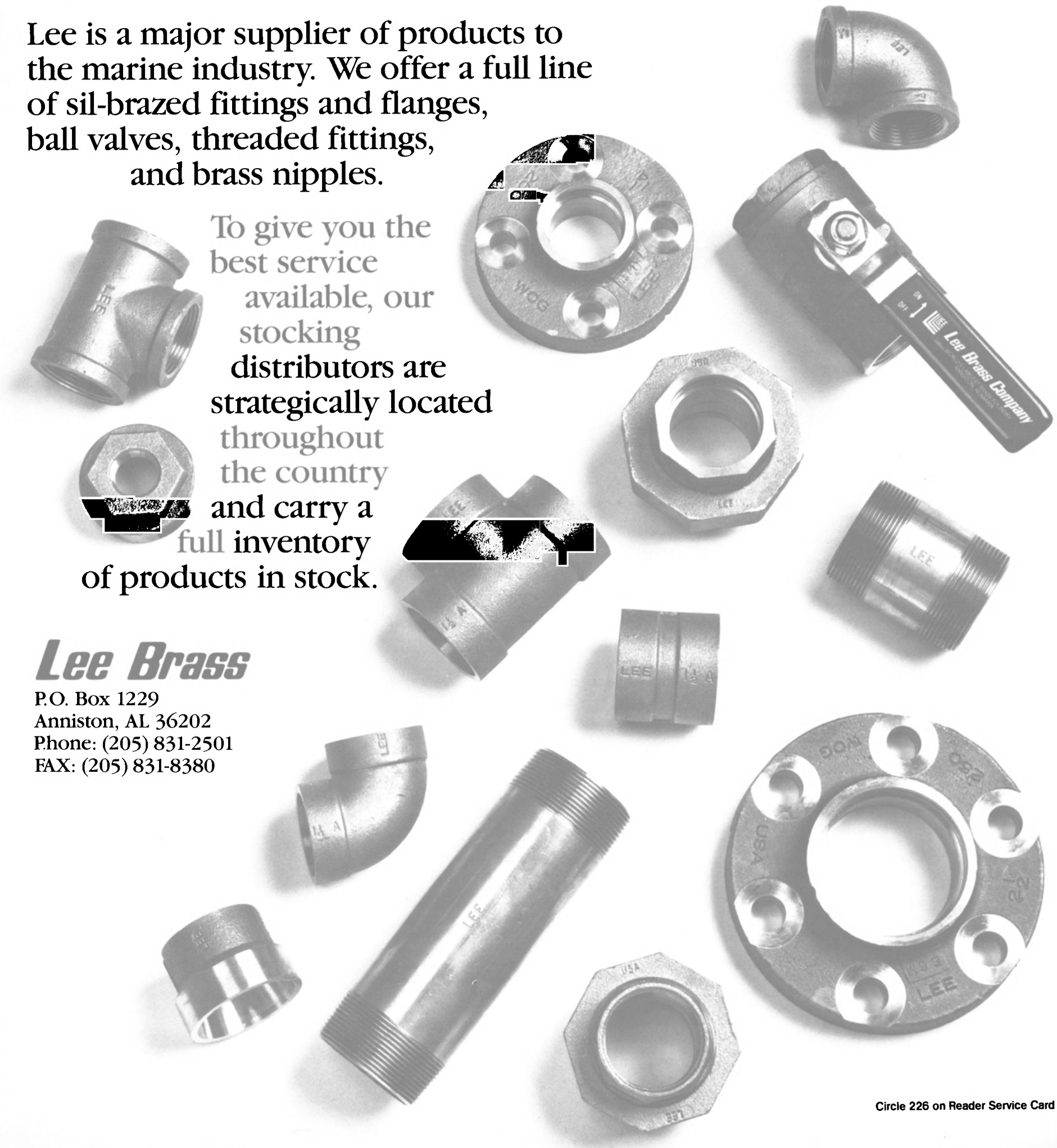

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on which the implementation proceeded.

AWO brought its substantial concerns to the attention of senior Coast Guard officers, providing a detailed listing of the provisions which were inappropriate for unmanned barges, and the general lack of relief which existing waiver provisions provided to barge operators. These discussions ultimately led to a regulation which acknowledged that the inclusion of inland equipment was inappropriate, and agreement that if cargoes now designated as Subchapter D should be redesignated as Subchapter O, that should be done through a separate rulemaking on which inland interests can focus. The Agency also agreed to broaden considerably the waiver provisions for coastwise trading barges, mitigating the effect of several provisions which had significant cost impacts.

The AWO effort in this matter secured the result that international requirements unnecessarily engrafted onto vessels trading domestically were either eliminated or substantially mitigated, without weakening the pollution prevention objectives of Annex II.

AWO's substantial campaign of analysis and advocacy in 1986 in response to the Coast Guard effort to revise and simplify the licensing regulations governing marine personnel bore fruit in 1987 with the publication of an Interim Final Rule that establishes a new licensing regime for the maritime industry. Absent the AWO campaign in 1986, this Interim Final Rule is likely to have had substantially negative impacts on the industry, embodied in dozens of provisions in the new licensing regulation. Prominent among them would have been a new Coast Guard interpretation of the watchstanding requirements for towing vessels in ocean service which would have eliminated the ability to sail under a two-watch system. The regulation would have also established regulatory authority not founded in the statutes which conferred upon the Coast Guard the ability to establish manning levels on uninspected vessels.

An analysis of the Interim Final Rule provides substantial reassurance that both the major and minor imperfections in the licensing proposal have been corrected. Many AWO-suggested changes were adopted. Most importantly, the Interim Final Rule retreats from the previous Coast Guard positions on the questions of watchstanding for ocean towing vessels and Coast Guard manning authority over uninspected vessels. With some additional clarifications which AWO suggested earlier this year, the Interim Final Rule should emerge as a regulation which provides needed modernization to the licensing regime for U.S. mariners without doing violence to important and longstanding provisions of law and regulation which govern towing vessel operations.

In 1987, AWO was able to secure an appropriate epitaph for the Department of Transportation's Marine Safety Reporting Program (MSRP) by tenaciously insisting on an evaluation of the program by DOT which was candid and sustained by fact.

AWO pursued an effort to inject into the MSRP a real world perspective that would lead to the conclusion that the program was flawed in its concept and should not be continued under private sector sponsorship. In late 1986, DOT released a draft evaluation report of the MSRP which essentially sought to conclude that the experimental program was a success. AWO took strong exception to DOT's draft conclusions, arguing that the evidence contained in the final report itself concluded that the MSRP was unneeded and ill conceived. AWO dissected the DOT draft report to unveil its fallacies; we shared with the Office of Management and Budget our conclusions that the MSRP addressed no demonstrated need and filled no safety promotion void.

On the weight of the AWO analysis, DOT released a revised final report in May 1987, which acknowledged that its draft report had been unduly optimistic. DOT cancelled the program. Had these results not been achieved, the MSRP concept could have developed into a misguided government program which imposed new burdens, but no benefits, on the marine industry.

AWO's analysis and advocacy in 1987 also took place on many other issues as well.

Nearly all of those agenda matters, and most of the issues dis-

cussed in the foregoing paragraphs, are sure to again require the industry's attention in 1988. Moreover, it is already apparent that 1988 presents an agenda crowded with a wide range of issues that have serious and far-reaching implications for the industry. For example, the vapor emissions debate will continue to consume large portions of the industry's time and resources. AWO is poised to give detailed attention to the anticipated proposals of the Coast Guard to establish testing requirements for marine personnel in the Administration's pursuit of its drug and alcohol program. The Association is also committed to securing in 1988 a final and enduring resolution to the subject of tank barge pilotage. Achieving a rational implementation of Annex V, MARPOL 73/78, and assisting in the development of a regulation to decrease occupational exposure to benzene in the marine industry, also loom large on the 1988 horizon.

AWO welcomes the challenges and the opportunities which these issues present. The Association's analysis and advocacy on these matters substantially improves the likelihood of their successful resolution. For each issue so addressed and resolved, one additional step is taken toward the ultimate objective of an environment of regulatory reason and stability. The process is ongoing, the issues are varied, the obstacles are many. The single constant is the objective.

1987: A YEAR OF MAJOR THREATS AND IMPORTANT VICTORIES

Dena L. Wilson
Vice President-Legislative Affairs
The American Waterways Operators

Dena L. Wilson

AWO's legislative activities serve two primary functions: the first, and most significant, revolve around active participation in the federal legislative process to influence the outcome of House and Senate action on specific bills. This objective is many times achieved with the help of industry coalitions. The second objective is maximizing AWO member involvement in the legislative and political process. The Association's legislative objectives are reinforced by member involvement on specific issues. Under the chairmanship of **William P. Morelli,** associate general counsel and director of government relations, Midland Enterprises Inc., Cincinnati, Ohio, the AWO Legislative and Legal Committee, in conjunction with the board of directors, guides the Association's activities in the legislative area.

Much of AWO's resources in 1987 were devoted to eliminating maritime services from the scope of the recently concluded U.S.-Canada Free Trade Agreement. In response to Canada's interest in gaining access to the entire Jones Act trade (inland, coastwise and Great Lakes), the U.S. Trade Representative alternatively proposed "grandfathering" the existing Jones Act while allowing Canadian vessel operators access to any new or expanded cabotage laws enacted after the effective date of the trade agreement. AWO, along with all segments of the U.S. maritime industry, organized together to mount an unprecedented battle to save the Jones Act and the future of the U.S. merchant marine.

This battle was waged on a variety of fronts: in the Executive branch, the Congress, and in the media. Legislative efforts initially revolved around building support for concurrent resolutions introduced by Representative **Walter B. Jones** (D-NC), House Merchant Marine and Fisheries Committee Chairman, and Senator **John B. Breaux** (D-La), Chairman of the Senate Merchant Marine Subcommittee, expressing opposition to using the Jones Act in negotiations with Canada. These resolutions received overwhelming bipartisan support, with a majority of representatives and senators signing on as cosponsors. Despite the Congressional outcry, the U.S. Trade Representative refused to take maritime services off the negotiating table.

Procedurally, the timetable established for approval of the agreement made it critical that maritime services be deleted from the text prior to submission to Congress. Once sent to Congress, a special "fast-track" process forbids any amendments to the agreement. Accordingly, the second phase of the legislative battle required a revision to the "fast-track" procedures to allow one amendment to be in order—the elimination of maritime services. This revision was approved by the Senate Rules Committee. The House Rules Committee announced its intention to take similar action; pressure on the U.S. Trade Representative greatly intensified.

Shortly before U.S. and Canadian negotiators put the finishing touches on the text, Congressional oversight hearings were announced, implementing the third phase of legislative efforts. The announcement of these hearings followed months of communication between senators and representatives to the U.S. Trade Representative, the Secretaries of the Treasury, Transportation, Defense, and the President and his staff. The decision to eliminate maritime services was finally made public on December 7, 1987, a major victory for AWO and the maritime industry.

The AWO membership actively participated in this united effort to save the Jones Act. Operators—inland and coastal—urged their representatives and senators to cosponsor the Jones and Breaux resolutions, and asked members of the Senate and House Rules Committees to vote for a rules change so Congress could eliminate maritime services from the FTA if the trade negotiators did not. AWO members traveled to Capitol Hill and contacted officials at the highest levels of the Administration to seek assistance.

Despite this victory, the precedent established by placing maritime services on the bargaining table might cause the issue to find its way into the GATT negotiations, and in the discussions leading up to a U.S.-Mexico Free Trade Agreement. As a part of its agenda for 1988 and beyond, the Association will monitor and strive to influence future U.S. negotiating positions on maritime issues.

AWO continues to identify areas where the Jones Act should be modernized to reflect transportation patterns of today. Most notably, AWO advocates extension of the Jones Act to all transportation activities within the 200-mile ,u-sive Economic Zone. Specifically, AWO has sought clarification that transportation of valueless material, i.e., sewage sludge and dredged material, falls under the jurisdiction of U.S. cabotage laws.

This issue gained prominence in May 1986 when the City of New York contracted with a foreign shipyard to build four barges for sewage sludge disposal at an EPA-designated site 106 miles off the coast of New Jersey. Legislation was introduced, H.R. 82, to require that future construction be performed in U.S. shipyards and that towing of existing and future barges be performed by U.S. companies utilizing U.S. crews. The bill was unanimously approved by the House of Representatives in July 1987, and the Senate Commerce, Science and Transportation Subcommittee on Merchant Marine held a hearing on sim-

ilar legislation, S. 1988, immediately after Congress convened in 1988. Enactment of this legislation remains an AWO priority.

In 1987, the Administration continued its efforts to persuade Congress to impose Coast Guard fees on commercial vessel operators for indirect services, i.e., aids to navigation, and direct services, i.e., inspections, documentation, and licensing of personnel, and will likely make one last attempt in 1988. Testifying at June 1987 hearings conducted by the House Coast Guard and Navigation Subcommittee, AWO Chairman Capt. **Arthur M. Knight,** executive director, Reinauer Companies, reiterated the industry's longstanding opposition to Coast Guard user fees. Captain **Knight** emphasized that the services in question are the result of statutorily-mandated requirements for which enforcement responsibility has been given by Congress to the Coast Guard. In response to that Congressional mandate, the agency performs a governmental function and has promulgated rules and regulations with which the industry must comply.

The Coast Guard's indirect fee schedule would cost domestic water carriers an *additional* $42 million per year in fees. Direct user fees for vessel inspections alone would add approximately $4.5 million to the industry's tax burden.

The industry remains opposed to the imposition of Coast Guard user fees; tug and barge operators have participated and shared in the effort to reduce the deficit through various user taxes currently paid to the Treasury. The Inland Waterways fuel user tax will double by 1995 under the Water Resources Development Act, P.L. 99-662. Port user fees were also established under this Act. The harbor maintenance fee established in P.L. 99-662 imposed, as of July 1, 1987, a new tax on cargo transported by water. Since January 1, 1987, AWO members have been paying a tax for cleanup of leaking underground storage tanks. Additionally, many vessel operators have been paying user fees to the U.S. Customs Service for paperwork processing.

These were fees that are in addition to the corporate taxes imposed on American business in general. It appeared that this burden would be somewhat ameliorated in late 1987 due to House passage of an amendment restoring the full deductibility of meals provided to crew members on vessels. This AWO-backed amendment, intended to correct the impact of the 1986 Tax Reform Act's limitation of the deductibility of business meals and expenses to 80 percent, will be addressed in 1988.

Since 1975, AWO has supported the establishment of an oil-spill cleanup and compensation fund to replace the four existing specialized funds, provided that such legislation preempted state requirements, provided reasonable limits of liability, and compensated legitimate victims of oil spills. Oil-spill legislation has traditionally been adopted by the House of Representatives, but stalled in the Senate primarily due to the body's opposition to legislation preempting the states from imposing duplicative taxes, damages or liability schemes. In 1987, the House Merchant Marine and Fisheries Committee modified previous legislative efforts to make its

(continued on page 47)

Why You Should Be A Member Of AWO

The American Waterways Operators (AWO) is the only association representing the national interests of the domestic inland and coastal tug and barge industry. Reflecting its national character, AWO's 300-plus member companies are located along the banks of all major U.S. waterways, and on the shores of the Atlantic, Pacific and Gulf Coasts. The AWO represents an industry that operates a massive fleet of over 7,500 coastal tugboats and inland river towboats, and over 32,000 barges. The association's network of influence spans the United States from Florida to Alaska, and from Minnesota to Louisiana.

Since AWO's founding in 1944, it has worked to define, support and promote its members' interests and operations. This association of the nation's tug and barge industry leaders also directs its efforts toward achieving a greater public awareness of the marine transportation industry's contribution to the American economy. AWO considers as its primary task to function as an informed and persuasive voice to the federal government, in the media, and when necessary, before the courts, speaking for the collective interests of its membership.

The membership of AWO includes all segments of the inland and coastal barge and towing industry, including tugboat, towboat, and barge operators, and the shipyards that build and repair the industry's vessels. The association's ever-growing affiliate membership is comprised of suppliers, manufacturers, insurers, bankers, and other associations and businesses concerned with the marine industry.

The association's members meet regularly, at least three times a year at national conventions, and also on a regional basis. Clearly, AWO is not just another "chowder and marching society," but instead is comprised of industry leaders who meet to discuss, deliberate, and *act* in an effective and productive way that will enhance the industry's business position. AWO is a tough, no-nonsense organization of allied businesses, joined together with the purpose of collectively promoting, protecting and defending their industry.

As the leader of this industry, AWO assumes the responsibility not only for monitoring and interpreting actions which may affect the association's members, but also of anticipating important developments and responding to them in a timely and effective manner. AWO provides its members with up-to-date reports on issues of concern, and speaks out, during the key developmental stages, on legislative and administrative proposals affecting the industry. The association's main objective is to demonstrate to national policy makers and the general public that barge commerce is a safe, fuel-efficient and cost effective method of transportation that plays a vital role in the nations integrated transportation system.

Those interested in learning more about membership in AWO, the nation's tug and barge industry association, should contact: **Jeffrey A. Smith,** vice president-public affairs, The American Waterways Operators, 1600 Wilson Boulevard, Suite 1000, Arlington, VA 22209; (703) 841-9300.

NAVAL TECHNOLOGY & SHIPBUILDING

a special supplement to

MARITIME REPORTER AND ENGINEERING NEWS

March 1988

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NAVY WILL SPEND OVER $9 BILLION IN FY 1988 ON R&D

Increasing R&D Budgets Offers Many Business Opportunities For Navy Suppliers

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

This year the U.S. Navy will spend over $9 billion for research and development—generating a flow of business opportunities for equipment manufacturers, technology firms, computer software and hardware suppliers, engineering firms. svstems integrators, etc.

R&D Funding Growth

Growth in Navy R&D spending during the 1980s has been impressive. In 1980, the Navy spent $4.6 billion for R&D. Eight years later the figure had more than doubled—$9.5 billion in 1988. This growth has opened new areas of research and has brought many new companies into the program.

Exhibit 1 traces the growth in overall spending for Navy R&D in the 1980s.

Photo: Carrier USS America (CV-66) in Norwegian waters. Official U.S. Navy photograph.

Range of R&D Activities

Equally impressive is the extent of activities. They range from the highly esoteric to the very practical—development of sensors for anti-air and antisubmarine warfare, C^3 systems for command and control, ship and naval aircraft development, missile and torpedo engineering, electronic warfare concepts, etc. Some of the hottest new technology is being developed—advanced composites, parallel computing, laser communications, distributed control systems, etc. And some of the more mature technology is being refined—hull forms, propeller design, mines, electric drive, navigation systems, etc.

Program Structure

There are more than 270 program elements—many of which have mul-

(continued)

Exhibit 1—Trend in the Navy R&D Budget

Fiscal Year	$ (in billions)	Index (1980=100)
1980	$4.6	100
1981	5.0	109
1982	5.8	126
1983	6.1	133
1984	7.6	165
1985	9.2	200
1986	9.6	209
1987	9.4	204
1988	9.5 (actual)	207
1989	10.0 (planned)	217

Source: Department of the Navy

U.S. NAVY

(continued)

tiple subprojects. Each program element is individually funded and sponsored. They are grouped according to stage of development:

- 6.1 and 6.2 programs involve research and exploratory development
- 6.3 programs deal with advanced development
- 6.4 programs focus on systems and component engineering

Projects usually enter the system at the 6.1 or 6.2 level, transition to 6.3 when found feasible and move to 6.4 engineering as the final R&D stage. Transition into the procurement budget (SCN, WPN or OPN) follows successful test and demonstration. Funding requirements generally increase dramatically as a project moves through this development/production pipeline. Exhibits 2 and 3 depict project transition and a typical funding profile.

Current Programs

Exhibit 4 provides an idea of the scope of current activities. This listing is taken from IMA's report on Navy R&D. Details are provided in the report for each of these activities.

Business Strategy

Successful Navy contractors have often been involved in early stages of system R&D. For example, RCA traces its highly successful role as Aegis manufacturer and system integrator to involvement in R&D efforts in the 1960s. Procurement contracts received by RCA for Aegis systems now exceed $3 billion. Boeing's involvement in the Sea Lance stand-off weapon can be traced back many years to its role in early exploratory research. Martin Marietta's development role in vertical launch system design led to its current position as one of two VLS suppliers. GE's early and sustained involvement in sonar sensor R&D has positioned the firm as dominant sonar system supplier.

What distinguishes these firms is their use of Navy funded R&D to (1) establish initial position, (2) widen and deepen technical involvement, (3) evolve into a key developer role and (4) transition into full production as sole source or lead manufacturer.

Opportunities exist for both large and small firms to employ similar strategy for future business development—using Navy R&D as the vehicle. This strategy entails (1) developing an understanding of future R&D programs, (2) matching the firm's capabilities with these programs, (3) measuring the competition, (4) shortlisting programs and areas of interest and (5) formulating and implementing a plan of action for initial entry and growth. IMA's report is designed to assist in the first and third phases of this strategy.

IMA has just published an assessment of this business sector. The report details activities in each of 204 specific R&D programs. Past and projected spending is shown, planned activities described, names of Navy managers and current key contractors listed. A 35-page statistical section lists major R&D contracts awarded over the past four years—alphabetically by contractor, giving contract amount, brief description, contracting office. Another section provides names and phone numbers for key contacts in each of the principal R&D points of buying power.

The 240-page report is available for $550.00. To order, contact: International Maritime Associates, Inc., 835 New Hampshire Ave., NW, Washington DC 20037; Telephone 202/333-8501; Fax 202/333-8504; Telex 64325 IMA.

Exhibit 2—R&D/Procurement Pipeline

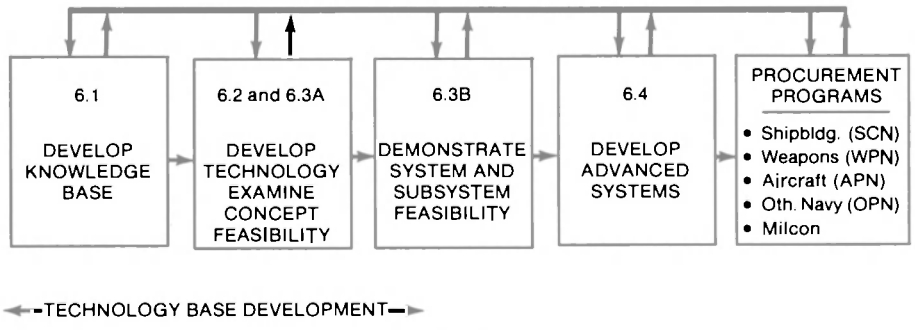


Exhibit 3—Typical Funding Profile

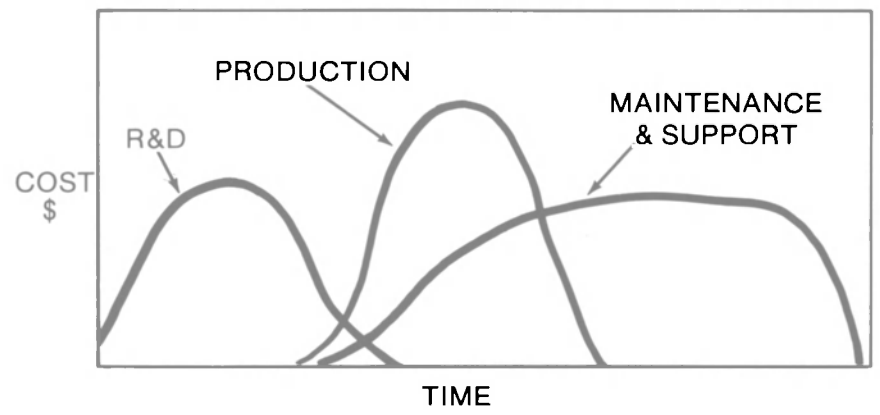


Exhibit 4—Programs Included in IMA's Recent Analysis of Future Navy R&D Spending
(excludes naval aircraft, avionics and air launched missiles)

I. SHIP DESIGN

Surface Ship Design & Engineering:
Surface ship technology—PE 62121
Advanced ship develop.—PE 63564
Contract design & engin. development—PE 64567
- Contract design—S1803
- Subsystem engine. development—S0857

Ship Subsystem & Component Development:
Auxiliary systems development—PE 63513-S0382
HM&E improvements—PE 63513-S1712
Voice multiplex comm. system—PE 63509

Catapults & Weapon Elevators:
Weapon elevator improvement—PE 63512-W1722
Catapult engineering—PE 63512-W1723
EAF matting—PE 63512-W1875

Gas Turbine Technology:
ICR turbine design—PE 63508-S0379
Turbine component improvement—PE 63508-S1848
RACER—PE 35108K/PE 63508-S1820

Electric Driver
Electric propulsion systems development—PE 63573

Electromagnetic Interference (EMI) Control:
EMI engineering—PE 65803

SSN 21 Engineering:
SSN 21 engineering development—PE 64561

Attack Submarine Development:
Submarine technology—PE 62323
Attack submarine development—PE 63569
- Adv. submarine technology—S1974
- SSN 688 development—S1570

Arctic warfare development—PE 63562

Trident Submarine Improvements:
Submarine system improvements—PE 11226

Nuclear Propulsion Technology:
Basic R&D—PE 62324
Advanced development—PE 63570
- Reactor components—S1258
- S6W propulsion plant—S1914

Improvements in existing plants—PE 25675
DOE naval nuclear reactor development—053-00-01

II. WEAPONS

D-5 Ballistic Missile (Trident II):
D-5 missile development—PE 64363-J0951
Submarine system engineering—PE 64323-J1546

Standard Missile (SM-2):
5M-2 improvements—PE 64366

Tomahawk Cruise Missile:
Tomahawk development—PE 64367

Air Defense Missiles:
Rolling airframe missile (RAM)—PE 64369
NATO Seasparrow upgrade—PE 64361

SSN 688 Vertical Launch System:
SSN 688 VLS engineering—PE 64370

Sea Lance ASW Standoff Weapon:
ASW standoff weapon engineering—PE 64309

Vertical Launch ASROC (VLA):
VLA-ASROC engineering—PE 64355

MK 48 Advanced Capability Torpedo (ADCAP):
ADCAP engineering—PE 64675

MK 50 Advanced Lightweight Torpedo:
MK 50 full scale engineering development—PE 64610
Advanced warhead development—PE 63610

Acoustic Torpedo Targets:
ADMATT—PE 63529-S0968
Fast/Deep prototype target—PE 63529-S1955

Mine Developments:
Basic mine technology—PE 62315
Advanced mine development—PE 63601
- new generation mine—S1556
- RECO—S1917
- Charger Gold—S1932
- CAPTOR*

Mine engineering—PE 64601
- mine improvements—S0267
- Quickstrike mine—S0272

Close In Weapon System (CIWS Phalanx gun):
CIWS Improvement engineering—PE 64358

III. SHIP DEFENSIVE SYSTEM

Electronic Warfare:
Shipboard EW improvements—PE 64572
EW coordination module eng.—PE 64230-X1979
Cover and deception—PE 24573
EW simulation—PE 24575
Counter communications—PE 24576
EW technology development—PE 62113

Defensive Weapons & Surveillance:
Technology research—PE 62111
Quick reaction surveillance system*

SSBN Survivability:
SSBN detection technology—PE 11224
Acoustic countermeasures—PE 11221-S1265
Countermeasure development—PE 63588

Ship Combat Survivability:
Combat survivability devel.—PE 63514
- ship survivability—S0384
- personnel protection—S1121
- ship damage control—S1565
- Empress II—S1607

Ship survivability engineering—PE 64516
Chemical warfare defense—PE 64506

Mine Countermeasures:
Minehunt sonar (AN/SQQ-32)—PE 63502-S0260
Mine countermeasure improvements—PE 63502-S1233
Surface ship magnetic silencing—PE 63502-S1597
Mine neutralization—PE 63502-S1404

Surface Ship Torpedo Defense:
Torpedo defense development—PE 63506
AN/SQR-17A torpedo detector*

Submarine Stealth:
Stealth engineering—PE 64515
Stealth equipment development—PE 63522

IV. SENSORS AND COMBAT SYSTEMS

Aegis AAW System:
Aegis upgrades—PE 64303
Aegis engineering—PE 64307
- CG 47 combat systems—S1447
- DDG 51 combat systems—S1337
- DDG 51 weapons—S1937

Aegis missile improvements—PE 63318
Aegis technology transfer—PE 63319

LAMPS MK III ASW System:
LAMPS improvement—PE 64212-W1707
Penguin missile integration—PE 64212-W1902

Search Radar Improvement:
Radar improvement engineering—PE 64508

Surface Ship Combat System Improvements:
New threat upgrade (NTU)—PE 64372
Combat direction system devel.—PE 64518
Combat direction system testing—PE 63582
Battlegroup AAW coordination—PE 63382

Surface Ship ASW Systems:
Ship silencing—PE 63553-S0229
Sonar system development—PE 63553-S1704
AN/SQQ-89 engineering improvements—PE 64713

ASW Combat System Integration:
System integration eng.—PE 25620

Infrared Search & Target Designation System:
AN/SAR-8 engineering—PE 64608

Submarine Sonar Development:
Basic ASW technology—PE 62314

Advanced development—PE 63504
Engineering development—PE 64503
AN/BSY-I Submarine Combat System:
AN/BSY-I engin. development—
PE 64524-S1347
FY 1989 Submarine Combat System:
AN/BSY-() engineering—
PE 64524-S1941
Attack Submarine Combat System Integration:
Combat system engineering—PE 64562
Surface Ship Bow Sonar:
AN/SQS-53C engineering—PE 64575

V. AREA ASW SURVEILLANCE
Underwater Sound Surveillance Systems:
Underwater surveillance systems
(IUSS)—PE 24311
Fixed distributed systems (FDS)—
PE 63784
ASW Surveillance Test and Evaluation
Test bed (ARIADNE)—PE 63743
ASW surveillance demonstration—
PE 63747
ASW critical experiments—
PE 63792-R1959
ASW Data Collection:
Remote ocean sensing sys. (N-ROSS)—
PE 35160-1697
Oceanographic & atmospheric
research—PE 62435
Oceanographic instrumentation—
PE 63704
ASW acoustic intelligence—PE 63708
Ocean measurement & modelling—
PE 63785
ASW oceanographic equipment—
PE 64704
Nonacoustic ASW:
Nonacoustic ASW assessment—
PE 63528

VI. COMMAND, CONTROL & COMMUNICATION (C^3)
Basic C^3 Technology:
Exploratory development—PE 62232
Warfare Support Systems:
Environmental support system—
PE 64230-X1752
Over the horizon radar—
PE 64230-X1779
Afloat correlation system—
PE 64230-X1847
WSS architecture & engineering—
PE 64230-X2011
Tactical Command Systems:
ASW operations center—
PE 64231-X0486
Tactical flag command center—
PE 64231-X0709
Submarine/shore ASW command
center—PE 64231-X1144
Ocean surveillance info system—
PE 64231-X2009
Warfare systems architecture & eng.—
PE 64231-X2010
Communications Systems:
High frequency anti-jam—
PE 64232-X0695
Communications automation—
PE 64232-X0725
EHF satellite terminals—
PE 64232-X0728
Fleet satellite communications—
PE 64232-X0731
Communications security—
PE 64232-X0734
JINTACCS—PE 64232-X1080
Tempest development—PE 64232-X1237
Satellite EHF commun. pkg.—
PE 64232-X1660
Command & control proc.—
PE 64232-X1743
Link-II Improvement—PE 64232-X1753
TADIX-B/tactical receive equipment—
PE 64232-X1845
Navy JTIDS—PE 64232-1977
ICS/SCAN—PE 64232-X1996
Warfare systems architecture/engin.—
PE 64232-X1991
C^2 Reconnaissance/Surveillance Support:
Tactical satellite reconnaissance—
PE 65867-T1034
Navy space systems—PE 65867-X1368
Space management—PE 65867-R2007

Submarine Communications:
Extremely low frequency (ELF)
commun.—PE 11401
Shore-to-ship strategic commun.—
PE 64232-X1083
Laser communications—
PE 64232-X1879
Integrated antenna engineering—
PE 64502
C^2 Requirements and Integration:
Top level C^2 requirements—PE 65866
Joint services C^2 modernization—
PE 33152

VII. SHIPBOARD COMPUTERS
Enhanced Modular Signal Processor (EMSP):
EMSP development—PE 64507
Standard Embedded Computer:
Standard hardware development—
PE 64574-X1350
Computer security—PE 64574-X0911
ADA language integration—
PE 64574-X0872
Next generation computer—
PE 64574-X1976

VIII. BASIC RESEARCH
Mathematical and Physical Sciences:
General physics—PE 61153-S11
Radiation Sciences—PE 61153-S12
Chemistry—PE 61153-S13
Mathematics—PE 61153-S14
Engineering Sciences:
Computer Sciences—PE 61153-S15
Electronics—PE 61153-S21
Materials—PE 61153-S22
Mechanics—PE 61153-S23
Energy conversion—PE 61153-S24
(continued)

U.S. NAVY

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

(As of January 1988)

SHIPYARD / Navy Designation	NAME	APPROX. CONTRACT $	EST. DELIVERY
Avondale Shipyards			
T-AO-193	Walter S. Diehl	116,000,000	8/88
T-AO-195	Leroy Grumman	101,000,000	5/89
T-AO-197	unnamed	100,633,789	2/90
LSD-44	Gunston Hall	166,000,000	8/88
LSD-45	Comstock	153,400,000	2/89
LSD-46	Tortuga	153,400,000	4/89
LSD-47	unnamed	150,000,000	11/89
LSD-48	unnamed	150,000,000	5/90
Bath Iron Works			
CG-58	Philippine Sea	252,800,000	1/89
CG-60	Normandy	191,800,000	9/89
CG-61	Monterrey	191,800,000	12/89
CG-63	Cowpens	193,300,000	4/90
CG-64	Gettysburg	193,300,000	11/90
CG-67	unnamed	236,041,276	4/92
DDG-51	Arleigh Burke	321,000,000	7/90
DDG-53	John Paul Jones	189,900,000	7/92
DDG-51 Class	—	22,600,000[1]	5/92
Bender Shipbuilding			
LCM-8 Class (4)	unnamed	3,000,000[2]	—
Bethlehem-Sparrows Point			
T-AGS-39	Maury	66,000,000	4/88
T-AGS-40	Tanner	66,000,000	8/88
Bollinger Shipyard			
WPB (16)	unnamed	99,306,516	2/90
General Dynamics-Electric Boat			
SSN-751	San Juan	280,100,000	6/88
SSN-752	Pasadena	280,100,000	10/88
SSN-754	Topeka	324,500,000	2/89
SSN-755	Miami	324,500,000	6/89
SSN-757	Alexandria	283,000,000	10/89
SSN-760	unnamed	258,166,750	2/90
SSN-761	unnamed	258,166,750	6/90
SSN-762	unnamed	258,166,750	10/90
SSN-763	unnamed	258,166,750	2/91
SSN-21 Class	—	28,900,000[3]	—
SSBN-734	Tennessee	523,700,000	12/88
SSBN-735	Pennsylvania	531,600,000	8/89
SSBN-736	unnamed	500,870,000	4/90
SSBN-737	unnamed	616,400,000	12/90
SSBN-738	unnamed	674,100,000	12/91
SSBN-739	unnamed	615,000,000	12/92
SSBN-734 Class	—	48,400,000[3]	12/88
SSBN-740	unnamed	644,000,000	7/94
Halter Marine			
T-AGOS-13	Adventurous	14,250,000	3/88
T-AGOS-14	Worthy	14,250,000	7/88
T-AGOS-15	Titan	13,844,067	3/89
T-AGOS-16	Capable	14,031,914	7/89
T-AGOS-17	unnamed	14,031,914	11/89
T-AGOS-18	unnamed	14,031,914	3/90
Ingalls Shipbuilding			
CG-56	San Jacinto		1/88
CG-57	Lake Champlain		8/88
CG-59	Princeton	325,500,000	10/88
CG-62	Chancellorsville	238,600,000	6/89
CG-65	Chosin	242,600,000	11/90
CG-66	Hue City	193,980,662	10/91
CG-68	Anzio	163,980,664	4/92
DDG-52	John Barry	162,149,000	9/91
LHD-1	Wasp	1,365,700,000	3/89
LHD-2	Essex	402,494,000	4/92
LHD-3	Kearsage	378,685,000[4]	1/93
CG-47 Class	—	44,128,775[5]	—
Intermarine USA			
MHC-51	unnamed	20,926,936	4/91

SHIPYARD / Navy Designation	NAME	APPROX. CONTRACT $	EST. DELIVERY
Lockheed-Gulfport			
LCAC (2)	unnamed	24,800,000	88
LCAC (7)	unnamed	115,586,281	—
Lockheed-Seattle			
LCAC (7)	unnamed	115,586,251	6/91
LCU (Army-7)	unnamed	26,000,000	—
Lockheed-Savannah			
LCU (Army-13)	unnamed	—	11/87-11/89
Marinette Marine			
MCM-2	Defender	46,000,000	8/88
MCM-4	Champion	42,000,000	12/88
MCM-7	Patriot	51,848,816	10/89
McDermott Inc.			
SWATH T-AGOS-19	unnamed	25,424,347	10/89
YTT 8 & 9	unnamed	21,700,000	—
Moss Point Marine			
LSV (Army-3)	unnamed	30,598,019	3/88
NASSCO			
AOE-6	Supply	290,097,944	4/91
Newport News Shipbuilding			
CVN-72	Abraham Lincoln	1,550,000,000	12/89
CVN-73	George Washington	1,550,000,000	12/91
SSN-723	Oklahoma City	225,100,000	5/88
SSN-750	Newport News	278,000,000	8/88
SSN-753	Albany	319,000,000	7/89
SSN-756	Scranton	259,833,000	9/89
SSN-758	Asheville	259,833,333	1/90
SSN-759	unnamed	259,833,333	6/90
SSN-760	unnamed	55,000,000[6]	—
SSN-764	unnamed	257,118,500	2/91
SSN-765	unnamed	257,118,500	5/91
SSN-766	unnamed	257,118,500	8/91
SSN-767	unnamed	257,118,500	11/91
SSN-21 Class	—	325,000,000[7]	2/94
SSN-21 Class	—	23,390,510[8]	4/88
SSN-21 Class	—	28,900,000[3]	—
Pennsylvania Shipbuilding			
T-AO-191	Benjamin Isherwood	111,000,000	10/88
T-AO-192	Henry Eckford	111,000,000	5/89
T-AO-194	John Ericsson	97,500,000	2/90
T-AO-196	unnamed	95,025,000	11/90
Peterson Builders			
MCM-3	Sentry	57,900,000	7/88
MCM-5	Guardian	57,900,000	6/89
MCM-6	Devastator	48,287,461	8/89
MCM-8	Scout	48,287,461	6/90
Robert E. Derecktor Shipyard			
WMEC-909	Campbell	30,160,000	1/88
WMEC-910	Thetis	30,160,000	5/88
WMEC-911	Forward	30,160,000	9/88
WMEC-912	Legare	30,160,000	1/89
WMEC-913	Mohawk	30,160,000	5/89
TB (Army-2)	unnamed	16,500,000	89
Tacoma Boatbuilding			
T-AGOS-11 & 12	unnamed	18,590,001	10/89
Textron Marine			
LCAC-13-24 (12)	unnamed	187,000,000	89/-6/91
Todd Pacific-San Pedro			
FFG-61	Ingraham	96,100,000	11/88

Footnotes: 1. Lead yard services contract; 2. Under subcontract from Twin City Shipyard 3. Design contract; 4. Contains $26 million for advance procurement of material for LHD-4; 5. Yard planning services; 6. Long lead procurement; 7. Detail design contract; 8. Contract services.

KEY TO NAVY DESIGNATIONS

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

*Assigned to Military Sealift Command
†Coast Guard

Exhibit 4

(continued from page 29)

Environmental Sciences:
Ocean sciences—PE 61153-S31
Ocean geophysics—PE 61153-S32
Atmospheric sciences—PE 61153-S33
Astronomy and astrophysics—PE 61153-S34
Life Sciences:
Biological and medical sci.—PE 61153-S41
Behavioral sciences—PE 61153-S42
Other Sciences:
Univ. research instrument.—PE 61153-S51
Multidisciplinary supp.—PE 61153-S52
Manufacturing Technology:
Flexible manufacturing systems—PE 78011-M0512
Computer aided propeller manufacture—PE 78011-S1101
Fire resistant nonmetallic bulkhead—PE 78011-S0933
Shipbldg. mfg. technology—n.a.
3D optical system—PE 78011-M0520
Rapid acquisition of manufactured pts. (RAMP)—n.a.
Circuit card assembly & processing system—PE 78011-0407
Integrated mfg. electronic packaging—PE 78011-0504
VHSIC mfg. technology—n.a.
Gallium arsenide mfg. technology—n.a.
Inspection & repair technology for aircraft—n.a.
Aircraft propulsion mfg. technology—PE 78011-A2222
Articulating robot for laser metalworking—PE 78011-S0806
Casting technology—n.a.
Electronics manufacturing—PE 78011-M0511
Ion plated metal matrix composites—PE 78011-M0413
Graphite metal mill shapes—PE 78011-M0421
Metal matrix composites—n.a.
Guayule Rubber—PE 78011-M0416
Traveling wave tubes—n.a.

IX. OTHER
Special Naval Warfare Equipment:
SEAL weapons systems—S0416
SEAL support systems—S0417
Special warfare combatant craft—S1684
Sealift Support Equipment:
Sealift systems engineering—PE 63726
Surface Warfare Training Devices:
Surface Tomahawk trainer—PE 64715-S1126
LAMPS MK III/SQQ-89 training system—PE 64715-S1132
Tactical electronic warfare trainer—PE 64715-S1140
Air tactical control operator trainer—PE 64715-S1274
Surface tactical team trainers—PE 64715-S1427
LCAC operator trainer—PE 64715-S1834
Surface warfare training analysis—PE 64715-S1436
Amphib. warfare tactical trainer—PE 64715-S1949
Training & Test Range Systems:
Instrumentation development—PE 64208-W0604
Mobile sea range—PE 64208-W0169
Atlantic underwater test center (AUTEC)—PE 65864-W0541
Weapons Security:
Advanced concepts—PE 63571
Systems engineering—PE 64563
Environmental Protection:
Ordnance disposal—PE 63721-S0400
Shipboard waste management—PE 63721-S0401
Pollution abatement—PE 63721-Y0817

* Added in defense appropriations bill

Source: International Marine Associates, Inc.—Future Business Opportunities in Navy Research & Development, February 1988

Circle 252 on Reader Service Card →

Fairbanks Morse Brochure Outlines Benefits Of New Ignition Generator

Fairbanks Morse Engine Accessories Operation, part of Colt Industries, outlines the benefits of their 9000RT Solid-State Ignition Generator in a new, colorful four-page brochure.

Designed for six through 12-cylinder gas engines, the 9000RT fires all cylinders at or before 50 rpm to ensure fast, easy starts under a variety of load and temperature conditions. Call-outs identify other benefits such as precise spark positioning (±1 degree), moisture-resistant housing, wide-band variable timing, low-starting speed and high-energy output.

The brochure also highlights Fairbanks Morse Vartime Accessories. These manual and automatic controls allow for ignition timing adjustments, which makes the 9000RT ideal for dual fuel applications. The automatic control option can vary ignition timing continuously in response to changes in engine operating parameters.

For your copy of this free color brochure from Fairbanks Morse Engine Accessories Operation,

Circle 4 on Reader Service Card

U.S. NAVY

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

(As of January 1988)

SHIPYARD	SHIP	TYPE OF WORK	$VALUE	COMP
Alabama Dry Dock	USS Lexington (AVT-16)	PM	10,131,466	8/90
Arcwell Corporation	USS Constellation (CV-64)	SRA	3,318,868	2/88
Atlantic Dry Dock	USS Aubrey Fitch (FFG-34)	DSRA	6,950,000	3/88
Avondale Shipyards	USS Boone (FFG-28)	SRA	9,998,452	7/88
	USS John J. Hall (FFG-32)	DSRA	11,170,581	9/88
	USS Radford (DD-968)	ROH	20,700,000	5/89
B & A Marine	Cape Avinof (RRF)	REP	3,474,555	1/88
Bath Iron Works	4 USCG Cutters	ROH	117,452,000	89
	USS Brumby (FF-1044)	ROH	14,501,392	4/88
	USS Koelsch (FF-1049)	OH	12,000,000	8/88
Bender Shipbuilding	USNS Sirius (T-AFS-8)	ROH	6,428,920	1/88
Bethlehem Steel— Sparrows Point	USNS Zeus	DD	1,800,000	2/88
Braswell Shipyards	USS Antigo (YTB-792)	SRA	1,047,448	4/88
Charleston Naval Shipyard	USS Andrew Jackson (SSBN-619)	OH	112,058,684	3/90
	USS Woodrow Wilson (SSBN-624)	OH	120,928,007	3/89
Colonna's Shipyards	USS Richard E. Byrd (DDG-23)	DSRA	4,280,000	7/88
Continental Maritime	USS Robinson (DDG-12)	SER	5,551,884	12/87
	USS Constellation (CV-64)	REP	8,100,000	2/88
	USS Mars (AFS-1)	DPMA	10,073,284	5/88
	USS Barbey (FF-1088)	DSRA	3,677,605	4/88
	USS Cook (FF-1083)	DSRA	3,324,711	4/88
Detyens Shipyards	USS Alamogordo (ARDM-2)	ROH	4,243,424	2/88
DMI Shipyard	MSB-1	ROH	41,057,000	—
General Ship Corp.	USS Trippe (FF-1075)	ROH	8,801,078	5/88
	USS Stephen W. Graves (FFG-29)	EDSRA	10,969,490	6/88
Honolulu Shipyard	USS Reclaimer (ARS-42)	ROH	3,312,606	1/88
Houston Ship Repair	Texas Clipper	REP	933,248	3/88
Ingalls Shipbuilding	USS Stark (FFG-31)	REP	28,700,000	8/88
	USS Wisconsin (BB-64)	MOD	221,762,170	10/88
	USS Mobile Bay (CG-53)	PSA	17,500,000	2/88
	USS Richmond K. Turner (CG-20)	ROH	28,780,830	7/89
Johnathan Shipyard	USS Saginaw	PM	9,900,000	6/90
Long Beach Naval Shipyard	LPH Class Ships	PM	8,096,132	10/90
McDermott Inc.	IX-513 Barge	MODIF	7,422,802	4/88
Metro Machine	Atlantic Fleet LPDs	PM	5,334,400	8/91
	USS Bowen (FF-1079)	OH	6,900,000	—
Mid-Coast Marine	USCG buoy tenders, Ironwood & Sweet Briar	DD	670,000	5/88
Moon Engineering	USS Josephus Daniels (CG-27)	REP	1,447,514	2/88
	USS Conynham (DDG-17)	REP	1,484,444	—
NASSCO	4 LSTs	PM	3,500,000	90
	3 LSTs	MAINT	5,858,543	—
	USS Hewitt (DD-966)	ROH	26,619,695	4/88
	USS Kinkaid (DD-965)	ROH	23,499,988	1/88
	USS Elliot (DD-967)	ROH	27,779,349	9/88
Newport News Shipbuilding	USS Pittsburgh (SSN-720)	SRA	7,055,300	7/88
	USS Enterprise (CVN-65)	OH	34,277,751	9/88
	USS George Bancroft (SSBN-643)	OH	19,400,000	3/88
	USS Newport News (SSN-750)	PSA	3,400,000	1/89
	Surface Ship Support Barge	REP	48,095,123	7/89
	USS Oklahoma City (SSN-723)	PSA	3,367,692	—
	USS Key West (SSN-722)	PSA	38,000,000	12/88
	USS George C. Marshall (SSBN-654)	REF	11,172,200	10/88
	USS Lewis Clark (SSBN-644)	REF	10,751,500	7/88
Norfolk Naval Shipyard	USS Baton Rouge (SSN-689)	SRA	5,462,494	10/88
	USS Vulcan (AR-5)	DSRA	4,800,000	5/88
Norfolk Shipbuilding	USS Fulton (AS-11)	DSRA	3,413,022	3/88
	USS Adroit (MSO-509)	REP	1,946,025	1/88
	AO-178, -179 & -186	PM	38,900,000	—
	USS Lawrence (DDG-4)	REP	4,966,666	—
	Cornhusker State T-ACS-6	CONV	15,653,333	2/88
	USS Puget Sound (AD-36)	ROH	12,210,546	5/88
	USS Moinester (FF-1097)	ROH	4,538,545	1/88
	USS Resolute (AFDM-10)	ROH	9,200,000	6/88
	USS Hunley (AS-31)	DSRA	4,400,000	12/87
	Mormacsea & Mormacsaga (RRF)	UPG	7,973,482	—
Northwest Marine Iron Works	USNS Observation Island (MSC)	OH	5,498,890	2/88
	USS Anchorage (LSD-36)	ROH	15,300,000	11/88
	USS Paul Foster (DD-964)	ROH	26,423,466	5/88
	USNS Mercy (T-AH-19)	PSA	4,600,000	4/88
Pennsylvania Shipbuilding	USS Sustain (AFDM-7)	ROH	5,500,000	2/88
	USS Patterson (FF-1061)	PM	5-10 mil/yr	—
Philadelphia Naval Shipyard	USS Independence (CV-62)	SLEP	240,000,000	—
Phillyship	USS Dale (CG-19)	PRA	7,994,080	2/88
Portsmouth Naval Shipyard	USS Kamehameha (SSBN-642)	ROH	112,100,000	11/88
	USS Albuquerque (SSN-706) & USS Philadelphia (SSN-690)	SRA	11,416,336	11/88
Puget Sound Naval Shipyard	USS Nimitz (CVN-68)	REP & OH	—	89
	USS Alexander Hamilton (SSBN-617)	ROH	110,713,798	11/88
	USS Scamp & two other subs	DEACT	—	87-88
Robert E. Derecktor	USS Connole (FFG-12)	ROH	2,500,000	—
Service Engineering	USNS Spica (T-AFS-9)	OH	10,700,000	—
	AE-29, -32-34	PM	4,154,000	89
	USS Vancouver (LPD-2)	ROH	13,280,669	2/88
	APL-4 Barge	REP	3,921,562	2/88
Southwest Marine	USS Dubuque (LPD-8)	OH	10,000,000	—
	USS Wichita (AOR-1) & USS Kansas (AOR-3)	REP	41,600,000	—
	USS Ogden (LPD-5)	DSRA	6,749,238	1/88
	USS Pluck (MSO-464)	SRA	1,041,000	—
	LST-1185, -1186 & -1191	OH	35,000,000	87-89
	USS Prairie (AD-15)	SRA	7,156,797	1/88
	USS Okinawa (LPH-3)	ROH	16,114,285	7/88
	USS Ramsey (FFG-2)	MAINT	3,000,000	4/88
Tacoma Boatbuilding	USNS Hayes (T-AG)	CONV	33,878,232	11/89
Tampa Shipyards	T-ACS-7 & -8	CONV	43,158,333	10/88
Todd-San Pedro	USS Bolster (ARS-38)	ROH	4,572,293	2/88
Todd-Seattle	8 WHECs	OH	234,903,000	2/91
USCG-Curtis Bay	14 buoy tenders	SLEP	8,500,000	—
	16 WMECs	MAINT	—	—

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

MAJOR NAVY CONTRACTS

The following special section features the latest U.S. Navy contract awards for shipbuilding, ship repair, electronics, communications and weapons. This special section covers Navy contracts awarded between December 28, 1987, and January 25, 1988. For contract awards prior to these dates, see the Naval Technology & Shipbuilding Supplement in the February issue of MR/EN.

December 28

Continental Maritime of San Diego, Calif., was awarded a **$3,324,711** firm-fixed-price contract for Drydocking Selected Restricted Availability (DSRA) for USS Cook (FF-1083). Work will be completed April 8, 1988. The Supervisor of Shipbilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8212).

Raytheon Company, Sudbury, Mass., was awarded a **$11,823,479** cost-plus-fixed-fee contract for engineering services for the Fleet Ballistic Missile Program. Work will be completed September 30, 1988. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-88-C-0006).

IBM Corporation, Federal Systems Division, Manassas, Va., was awarded a **$220,120,000** modification to a previously awarded definitization of a fixed-price-incentive contract for four FY-87 AN/BSY-1(V) shipsets for SSN-764 thru SSN-767. Work will be completed in July 1992. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6170).

GNB Incorporated, Industrial Battery Division, Langhorne, Pa., was awarded a **$10,542,606** modification to a previously awarded firm-fixed-price contract for materials for batteries for SSN-688 class submarines. Work will be performed in Kankakee, Ill., and is expected to be completed in December 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-4123).

Raytheon Company, Equipment Division, Wayland, Mass., was awarded a **$65,855,000** modification to definitize a previously awarded contract for Aegis SPY-1 and Fire Control Systems (FCS) with spares and training equipment for various CG-47 and DDG-51 class ships. Work will be completed September 30, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5170).

Hughes Aircraft Company, Ground Systems Group, Fullerton, Calif., was awarded a **$184,950,000** firm-fixed-price contract for production of 123 torpedoes plus proofing materials for the Advanced Capability (ADCAP) MK-48 torpedo program. Work will be completed in December 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-6148).

IBM Corporation, Federal Systems Division, Manassas, Va., was awarded a **$311,764,000** modification to a previously awarded fixed-price incentive contract for four FY-86 AN/BSY-1(V) shipsets and one maintenance trainer for SSN-760 thru SSN-763. Work will be completed in July 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-6412).

December 29

Newport News Shipbuilding and Drydock Company, Newport News, Va., was awarded a **$11,172,200** firm-fixed-price contract for an extended refit period for SSBN-654. Work will be performed in Holy Loch, Scotland, and is expected to be completed October 30, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2098).

Newport News Shipbuilding and Drydock Company, Newport News, Va., was awarded a **$10,751,500** firm-fixed-price contract for an extended refit period for SSBN-644. Work will be performed in Charleston, S.C., and is expected to be completed July 30, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2097).

Life Cycle Engineering Incorporated, Charleston, S.C., is was a **$5,108,201** cost-plus-fixed-fee contract for engineering and technical support for the SSN/SSBN Submarine Maintenance/Modernization Program. Work will be performed in Washington, D.C., and is expected to be completed September 30, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2124).

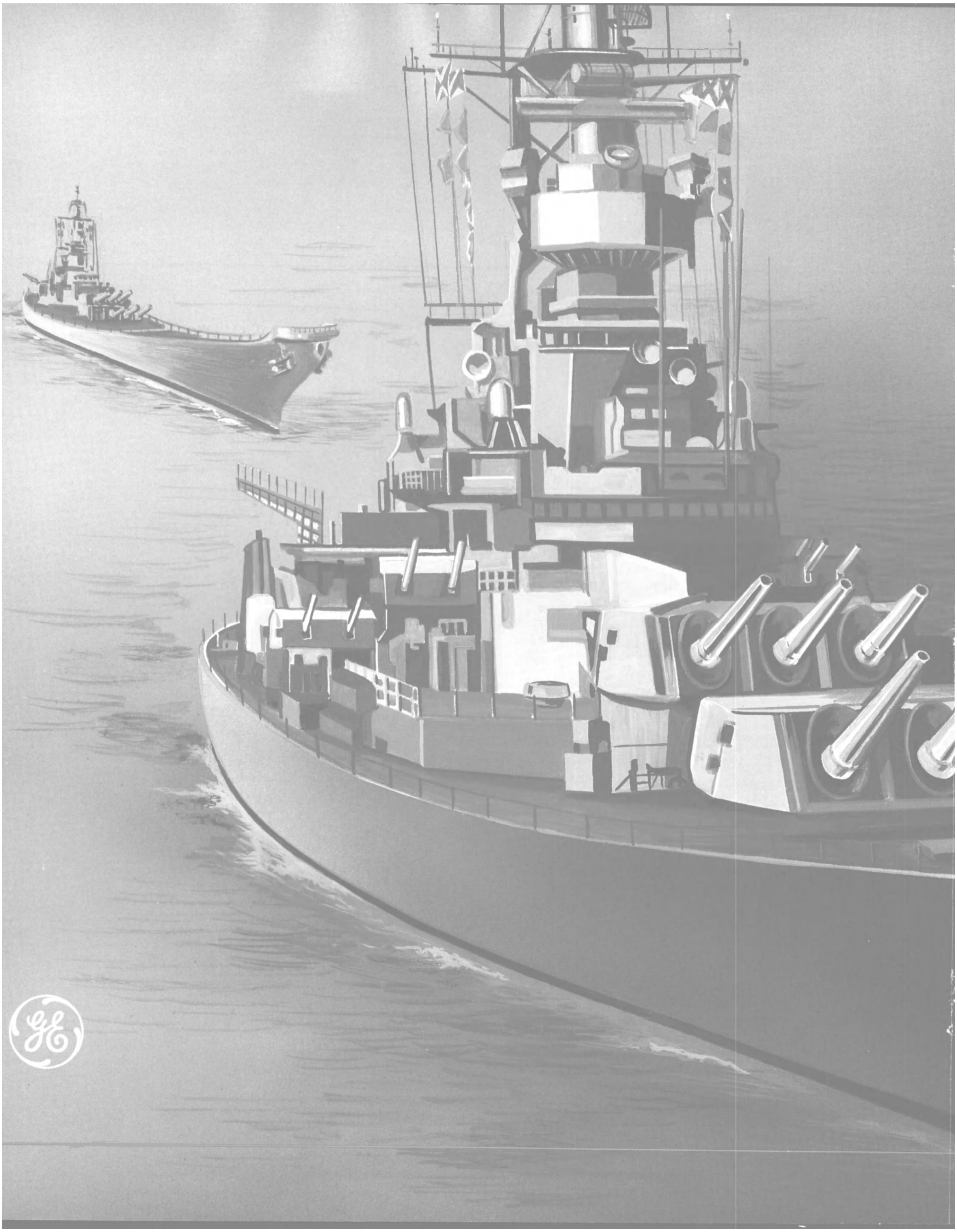
December 31

Ingersoll-Rand Company, Engineered Pump Division, Phillipsburg, N.J., was awarded a **$3,100,000** firm-fixed-price contract for eight MK 19 Mod 0 turbine pump ejection systems. Work will be completed in March 1990. The Naval Underwater Systems Center, Newport, R.I., is the contracting activity (N66604-88-C-0085).

AT&T Technologies Incorporated, Greensboro, N.C., was awarded an **$18,332,979** firm-fixed-price contract for oceanographic research and engineering. Work will be completed January 1, 1990. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-88-C-0134).

January 6

Litton Data Systems, Van Nuys, Calif., was awarded a **$5,140,900** modification to a previously awarded firm-fixed-price con-



Old Reliables.

GE Propulsion Systems Powered The *Iowa* And *Missouri* Through World War II And Korea. They're Still Going Strong.

Formidable Giants

The *Iowa*. The *Missouri*. Two proud veterans of the Iowa Class, the only class of battleships in the world still in service, the largest that can pass through the Panama Canal. Today, they're running as reliably as ever on their original GE propulsion systems to perform vital missions for the U.S. Navy.

Hard Duty

These battleships exert heavy demands upon the four sets of GE steam turbines and gear systems aboard each ship. Despite this, all run as smoothly today as when the ships were first commissioned in 1943 and 1944, which is no easy task when you consider what these propulsion systems move: over 44,500 standard tons with steel armor belts between 12.1 to 16.2 inches thick. Three batteries of huge 16 inch guns that fire 1800 pound shells over 20 miles. More than 1600 crew members. Plus additional weaponry and armor. And lots of it.

Sitting idle can punish these "giants" as much as wartime duty. Yet, the *Iowa* and *Missouri* remain at sea having endured both. The *Iowa* was recommissioned in 1984 after a 26 year layup; the *Missouri* in 1986 after a 31 year layup. When restarted, however, the GE propulsion systems worked flawlessly without modification, rebuild or repair.

Living Legends

More firepower was added to their huge gun batteries. Now, both battleships carry modern Cruise, Tomahawk and Harpoon missiles. Yet the GE propulsion systems built in the 1940s still move these ships at speeds of up to 35 knots. And, they aren't done yet, as we expect both to be in service for at least another decade or more.

Proud Tradition

From battleships, super carriers and submarines to the smallest auxiliary ships, GE is the leading supplier of propulsion and ships service turbine generator systems to the Navy. As such, GE has provided unmatched engineering, manufacturing and test expertise — as well as advanced technology and proven performance—for more than 75 years. The "build'em to last" philosophy which resulted in durability, reliability and performance exemplified by the *Iowa* and the *Missouri* for over 40 years lives today at Naval & Drive Turbine Systems. We look forward to building upon this experience with new products and services which will advance the Navy mission into the 21st Century. General Electric Company, 166 Boulder Drive, Fitchburg, MA 01420.

Circle 147 on Reader Service Card

GE Naval & Drive Turbine Systems

tract for 37 AN/GRC-171 (V)4 radios and 56 AN/VRC-47 VHF radios to be used to support first article testing of the AN/TYQ-23 (V)1 and (V)2. Work will be completed July 31, 1989. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-87-C-0330).

January 11

Bath Iron Works, Bath, Maine, received a **$11.9-million** contract for services for CG-47 class ships. Work is expected to be completed in January 1991. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-88-C-2138).

January 12

Litton Amecon, College Park, Md., received a **$3-million** contract for AN/BLD-1 direction finding systems for new submarines. Work is expected to be completed in January 1990. The contract was awarded by the Naval Sea Systems Command, Washington, D.C., (N00024-87-C-5014).

General Dynamics Corp., Electric Boat Division, Groton, Conn., received a **$152.7-million** contract for engineering and technical services for Ohio class submarines. Work is expected to be completed in September 1990. The contract was awarded by the Naval Sea Systems Command, Washington, D.C., (N00024-88-C-2219).

January 13

UNISYS Corporation, Great Neck, N.Y., was awarded a **$3,484,908** cost-plus-fixed-fee contract for engineering services for the Fleet Ballistic Missile program. Work will be completed March 31, 1989. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-88-C-0049).

Vitro Corporation, Silver Spring, Md., was awarded a **$26,965,021** cost-plus-fixed-fee contract for services for various submarine maintenance programs. Work will be completed September 30, 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2139).

January 14

RCA, Electronic Systems Division, Moorestown, N.J., was awarded a **$375,700,000** fixed-price-incentive contract for MK 7 Aegis weapon systems for CG-66, 67, 68 and DDG-52 and 53. Work will be completed in July 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-5140).

York International Corporation, York, Pa., was awarded a **$4,497,184** firm-fixed-price contract to procure 363 refrigerant 114-ton air conditioning units plus related engineering services. Work will be completed June 1, 1992. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-4200).

January 15

General Dynamics Corp., Pomona, Calif., has received a **$163.5-million** contract with performance incentives for the Standard Missile 2 for Terrier, Aegis and Tartar-equipped ships. Work is expected to be completed in December 1990. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-88-C-5300).

Raytheon Co., Missile Systems Division, Bristol, Tenn., has received a **$130.5-million** contract with performance incentives for the Standard Missile 2 for Terrier, Aegis and Tartar-equipped ships. Work is expected to be completed in December 1990. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-88-C-5301).

AT&T Technologies, Inc., Greensboro, N.C., has received a **$17.7-million** contract for oceanographic services. Work is expected to be completed by April 15, 1988. The contract was awarded by the Space and Naval Warfare Systems Command, Wash-

ington, D.C. (N00039-88-C-0069).

Northwest Marine Iron Works, Portland, Ore., has received a **$4.6-million** contract for the post shakedown availability of USNS Mercy, a Navy hospital ship operated by the Military Sealift Command. Work is expected to be completed in April 1988. The contract was awarded by the Military Sealift Command, Washington, D.C. (N62383-88-C-0007).

January 19

RCA, Electronic Systems Department, Moorestown, N.J., has received a **$329.5-million** contract for MK 7 Aegis weapon systems for the CG-69, 70, 71, 72 and 73. Work is expected to be completed in March 1992. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-88-C-5140).

Dynamics Systems Inc., Reston, Va., has received a **$5.1-million** contract for logistic, engineering and support services. Work is expected to be completed by September 30, 1992. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-88-C-6168).

Northwest Marine Iron Works, Portland, Ore., has received a **$15.3-million** contract for the regular overhaul of USS Anchorage (LSD-36). Work is expected to be completed by November 3, 1988. The contract was awarded by the Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Va. (N00024-85-H-8197).

Jaunary 22

Rockwell International Corp., Anaheim, Calif., has received a **$7.1-million** contract for engineering support services for the AN/BQQ-9 sonar system program. Work is expected to be completed in September 1989. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-88-C-6000).

January 25

Colonna's Shipyard Inc., Norfolk, Va., has received a **$4.2-million** contract for Drydocking Selected Restricted Availability for USS Richard E. Byrd (DDG-23). Work is expected to be completed by July 3, 1988. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-85-H-8134).

General Dynamics, Valley Systems Division, Pomona, Calif., has received a **$7.7-million** contract for leader services and production planning services for the Rolling Airframe Missile. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-85-C-5350).

Avondale Industries, Inc., Shipyards Division, New Orleans, La., has received a **$20.7-million** contract for the Regular Overhaul of USS Radford (DD-968). Work is expected to be completed by May 3, 1989. The contract was awarded by the Naval Sea Systems Command, Washington, D.C. (N00024-85-H-8113).

A&T Receives Navy Contracts Worth $14.2 Million

Analysis & Technology, Inc. (A&T), North Stonington, Conn., recently received $14.2 million in Navy contracts.

A&T was awarded a $10.2-million, three-year contract by the Naval Underwater Systems Center (NUSC), Newport, R.I. Under the contract, A&T will provide technical services in support of submarine combat control system architecture, targeting and ranging exercise programs through analytical studies, advanced development model design and development, and at-sea test and evaluation.

The company also received a second NUSC, three-year contract worth $2.4 million to provide electromagnetic engineering services for shipboard electronic systems on surface ships.

The company received additional subcontracts valued at about $1.6 million.

A&T is a leading company in the field of submarine and antisubmarine warfare technical services to the U.S. Navy.

MonArk To Build 10 Patrol Boats Under $3.7-Million Award

MonArk Boat Company of Monticello, Ark., has received a $3,697,222 fixed-price contract to construct 10 forty-one-foot patrol boats.

The contract, which is expected to be completed in March 1989, purchases the boats for El Salvador under the Foreign Military Sales program. The Naval Sea Systems Command contracted the project. The contract is N00024-88-C-2072.

The LCAC-12 is the newest Landing Craft, Air Cushion Vehicle delivered by Textron Marine Systems, New Orleans, La. The yard has contracts to build 12 additional LCACs for the Navy.

Textron Marine Systems Delivers 12th LCAC To Navy

John J. Kelly, president of Textron Marine Systems (TMS), division of Textron Inc., recently announced a successful end to 1987 with the delivery of Landing Craft, Air Cushion (LCAC) -12 to Assault Craft Unit Four (ACU-4). Acceptance of the craft by the U.S. Navy was at the Panama City, Fla., LCAC support facility.

LCAC-12 was driven under her own power from the New Orleans TMS production facility, across the Gulf of Mexico to Panama City.

The LCAC is an amphibious air cushion vehicle that can quickly transport troops, equipment and weapons from support ships over the horizon to dry ground beyond the beach and surf at speeds in excess of 40 knots.

Textron Marine Systems previously delivered the first six LCACs in 1986, and these are currently operating with the U.S. Navy Amphibious Force, Pacific Fleet, at ACU-5, Camp Pendleton, Calif. Craft seven through 11 are now in operation at ACU-4 at Little Creek, Va. Eventually, 45 LCACs are scheduled to be deployed at the East Coast base and another 45 LCACs at the West Coast facility. Textron Marine Systems has another 12 LCACs under construction at its production facility in New Orleans.

The Navy plans to acquire nine additional LCACs in fiscal year 1989, with subsequent procurement of additional craft in the 1990s.

For free literature on Textron Marine Systems,

Circle 34 on Reader Service Card

Avondale Industries Christens Their Second Landing Ship Dock In Series Of Five

The second in a series of five Landing Ship Dock (LSD) vessels being built for the U.S. Navy was christened the USS Comstock (LSD-45) at recent ceremonies at the Shipyards Division of Avondale Industries, Inc., New Orleans, La.

Named for a historic mining site in Nevada, the Comstock is 609 feet 7 inches long, with a beam of 84 feet, full load draft of 19 feet 7 inches and full displacement of 15,745 tons. Powered by four medium-speed Colt-Pielstick diesel engines for a total ship's horsepower of 33,000 shp, the Comstock is capable of service speeds in excess of 20 knots. She is equipped with 60-ton and 20-ton cranes, manufactured by Lake Shore, and will be manned by 22 officers and 390 enlisted men.

The Comstock, like her sister LSDs, is a multifunctional ship capable of a wide range of amphibious assault operations for the Navy and Marine Corps. Her primary mission is to carry, launch and dock up to four Landing Craft Air Cushion (LCAC) vessels. The LCACs and other equipment are carried in the Comstock's 440-foot-long inside well.

At the Comstock's christening,

Colt-Pielstick-powered USS Comstock (LSD-45), second in a series of Landing Ship Dock vessels being built at Avondale Industries, Inc., was recently launched.

Mrs. **Jan Gray,** wife of Gen. **Albert M. Gray Jr.,** 29th Commandant of the U.S. Marine Corps, served as the ship's sponsor.

Other christening participants included: the Honorable **Robert L. Livingston,** U.S. Congressman, 1st District, Louisiana; the Honorable **Lindy Boggs,** U.S. Congresswoman, 2nd District, Louisiana; Capt. **Joseph E. King,** USN, Deputy Commander, Amphibious, Auxiliary, Mine and Sealift Ships, Naval Sea Systems Command; **Albert L. Bossier Jr.,** chairman of the board, Avondale Industries, Inc.; Capt. **Paul D. Hurst,** USN, Supervisor of Shipbuilding, Conversion and Repair, New Orleans; and **Richard F. Brunner,** executive

USS COMSTOCK
Equipment List

Main engines (4)	Colt-Pielstick
CP propeller	Bird-Johnson
Generators	Colt-Pielstick
Shaft forgings	National Forge
Reduction gear	Philadelphia Gear
Steering gear	Paul Munroe
Electrical motors	GE
Main console	Rexnord
Centrifugal pumps	Carver Pump
Deck cranes	Lake Shore
Auxiliary boiler	Combustion Engineering
Damage control	Henschel
400 Hz frequency changers	Teledyne
Ventilation fans	Buffalo Forge
Cargo elevators	Unidynamics
Radio monitoring system	Nuclear Research

Principals at the Comstock's christening are (L to R, first row): Mrs. **Paul Hurst;** Miss **Jo Ann Chibirka;** Mrs. **Albert L. Bossier Jr.;** Miss **Janice Peters,** maid of honor; Mrs. **Jan Gray,** ship's sponsor; flower girl **Cherie Ann Abadie;** Mrs. **Ralph Goss,** mother of the sponsor; Congresswoman **Lindy Boggs;** and Mrs. **Robert H. Barrow.** (Second row, L to R): **Albert L. Bossier Jr.,** chairman & CEO, Avondale Industries, Inc.; Cmdr. **Robert H. Howe,** prospective commanding officer; Mrs. **Robert H. Howe;** Capt. **Paul D. Hurst,** USN, Supervisor of Shipbuilding, Conversion and Repair, New Orleans; Mrs. **Norman Mosher;** Gen. **Alfred M. Gray Jr.,** Commandant, USMC; Mrs. **Louis H. Wilson;** Lt. Col. **Ralph R. Goss,** USAF (Ret.); and former USMC Commandants, Gen. **Robert H. Barrow** and Gen. **Louis H. Wilson.**

officer, Avondale Industries, Inc.

The maid of honor at the christening was Miss **Janice Peters** and the flower girl was **Cherie Ann Abadie,** the daughter of two Avondale employees.

The Comstock and other LSD ships are constructed by means of modular fabrication. The Comstock is expected to be delivered in February 1989.

Avondale Industries, Inc., specializes in marine fabrication of military and commercial seagoing vessels and offshore structures for the oil and gas industry. For free literature detailing their shipbuilding services,

Circle 33 on Reader Service Card

Advanced Marine Selected To Support NAVSEA's Ship Design Group

The Naval Sea Systems Command has selected Advanced Marine Enterprises, Inc. (AME) as one of two companies to support NAVSEA's Ship Design Group. The recently awarded contract (with options) is for 1.5 million manhours and extends over the next five years. The scope of work is very broad and encompasses ranging from virtually all aspects of ship systems engineering and analysis to whole ship design of noncombatants and covers all phases of the life cycle of a ship.

AME already supports NAVSEA in the area of naval architecture. This award, therefore, confirms AME's position as one of the leading firms in the country in naval architecture, marine engineering, and systems engineering.

Mid-Coast Marine To Perform Overhaul Work At Coos Bay Drydock

The U.S. Coast Guard has awarded a major contract worth about $670,000 to Mid-Coast Marine Corporation, Coos Bay, Ore., for the drydocking of two buoy tenders.

The Alaskan-based vessels, the USS Ironwood, from Cordova, and the USS Sweet Briar, from Kodiak, will be stationed in the International Port of Coos Bay until May 21, 1988. They will be overhauled in the port's drydock.

Frank Martin, port general manager, stated: "Through the efforts of our Congressional delegation, Oregon now has a greater bidding opportunity on Coast Guard work. This port can now also bid on the USS Clover out of Eureka, in addition to nine other Alaska, Washington, Oregon and California-based vessels."

This announcement follows a decision by the U.S. Government to allow the Polish North American fishing fleet to potentially do major repair work at Coos Bay. Coos Bay is the only U.S. West Coast port with such an allowance.

Furthermore, construction is now under way on a new ship-repair facility at the port's Charleston Industrial Annex to develop a fabrication and repair center for local commercial fishing vessels.

For further details on the Port of Coos Bay ship-repair facilities,

Circle 48 on Reader Service Card

Faught Appointed To Navy Post

After confirmation by the Senate, **Thomas F. Faught Jr.** was recently sworn in as the new Assistant Secretary of the Navy for Research, Engineering and Systems.

In his new office, Mr. **Faught** will be responsible for all aspects of research, development, test and evaluation of Navy and Marine Corps combat systems and weapons. He will oversee annual expenditures approximating $10 billion and be responsible for the management of 38,000 people and 44 research laboratories and test centers.

Prior to accepting his appointment, Mr. **Faught** was president and chief executive officer of Dravo Corporation, an international engineering, natural resource and equipment manufacturing company.

The new Army Logistic Support Vessel General Frank S. Besson, built by Moss Point Marine of Escatawpa, Miss., is powered by two EMD diesel engines.

Moss Point Marine Delivers First Of Four Army Landing Ships

The U.S. Army has entered into a new era in marine transportation with the delivery of the General Frank S. Besson (LSV-1), the first of four 273-foot Logistic Support Vessels being built by Moss Point Marine, Inc., Escatawpa, Miss., under a $40.7-million contract.

The ship is the first of a new class of landing craft with roll-on/roll-off (RO/RO) capabilities which permit their use where there are no ports. The RO/RO capability is made possible by bow and stern ramps which enable off-loading of cargo to undeveloped beaches and unloading from other vessels or wharves.

Speaking at the vessel's christening, Maj. Gen **Fred E. Elam,** the Army's chief of transportation, said the new ships will give the Army state-of-the-art capabilities by replacing boats built 30 to 40 years ago and they will allow the Army to "... select where we are going to come in rather than letting the enemy dictate it or the facility dictate it."

The General Besson (and sister ships to follow) is equipped with an on-board computer linking it with logistic data files at U.S. Army and Navy stock points.

The all-steel landing ship is 273 feet in length with a 60-foot beam and 16-foot five-inch depth. Propulsion is provided by two General Motors EMD 16-1645-E2 diesel engines. It can transport between 900 and 2,000 short tons of cargo depending on the type of operation. The LSV is capable of approximately 12 knots sustained speed and has a range of over 5,500 nautical miles at loaded displacement. It has a crew of six officers and 24 enlisted personnel.

The Army contract was awarded by the Navy's Military Sealift Command and is being administered by the Navy's Supervisor of Shipbuilding, Conversion, and Repair (SUPSHIPS) in Pascagoula, Miss.

John Dane III, president of the Trinity Marine Group which includes Moss Point Marine, Inc., said the three sister ships will be delivered at approximate 60-day intervals.

The Trinity Marine Group is owned by Trinity Industries, Inc., Dallas, Texas.

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

Circle 31 on Reader Service Card

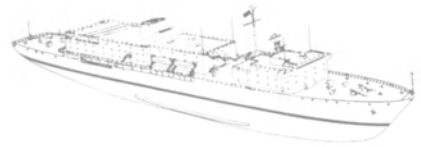
Principals at the christening were (L to R): **Joseph N. Shrader,** Deputy Commander, Naval Sea Systems Command; Rear Adm. **John R. Seesholtz,** USN, Oceanographer of the Navy; **Mistie Shaw,** ship's sponsor; Congresswoman **Helen Delich Bentley,** principal speaker; Vice Adm. **Walter T. Piotti Jr.,** Commander, Military Sealift Command; and **David Watson,** general manager, Sparrows Point shipyard.

Bethlehem Steel Christens Navy Oceanographic Survey Ship At Sparrows Point Shipyard

Also Dedicates New Drydock

The USNS Maury, a sleek oceanographic survey ship nearing completion at Bethlehem Steel Corporation's Sparrows Point shipyard, was christened recently by Mrs. **Dennis R. Shaw** of Alexandria, Va.

Mrs. **Shaw,** who, as the ship's sponsor, broke a bottle of champagne on the bow, is the wife of **Dennis R. Shaw,** Deputy Under Secretary of the U.S. Navy for policy. The **Shaw's** daughter, **Jaimie,** served as flower girl.



Drawing of the USNS Maury, the lead ship of the Navy's new class of oceanographic survey vessels.

U.S. Rep. **Helen Delich Bentley,** R-Md., who worked with Bethlehem to obtain the $130-million, two-ship contract in 1985, was principal speaker at the christening.

"Commander Matthew Fontaine Maury, in the mid-1800s, was this country's pioneer oceanographer," Rep. **Bentley** said. "It is very fitting that this first-of-its-class, ultramodern ship carry his name and chart the seas for a strong Navy."

Other principals at the christening were Vice Adm. **Walter T. Piotti Jr.,** Commander, Military Sealift Command; Rear Adm. **John R. Seesholtz,** USN, Oceanographer of the Navy, who dedicated the keel for the Maury on July 29, 1986, and **Joseph N. Shrader,** Deputy Commander, Naval Sea Systems Command.

Also attending were Capt. **Richard E. Westbrook,** Supervisor of Shipbuilding, Conversion and Repair, USN, Portsmouth, Va., and Capt. **William C. Pfister,** program manager, Auxiliary/Special Mission, Ship Acquisition Program, Naval Sea Systems Command.

Representing Bethlehem Steel were **Robert M. Funk,** general manager, steel-related group; **David H. Klinges,** president, marine construction division, and **David Watson,** general manager, Sparrows Point yard.

The Maury, with a 500-foot length, 72-foot beam and 30-foot draft, is scheduled to be delivered in July, followed by the delivery in December of its sister ship, the USNS Tanner, also under construction at the yard.

The ship will be used primarily to conduct ocean surveys and provide scientific data. A staff of more than 100 will include a crew of 56 from the Military Sealift Command, 32 U.S. Navy personnel and 20 scientific personnel.

Prior to the ceremony, Rep. **Bentley** christened the yard's new floating drydock, named the Bethpride. The 44,000-ton-capacity drydock was moved to Sparrows Point last year from the company's former Key Highway ship repair yard.

The drydock was reconditioned and is being leased from the Maryland Economic Development Corporation. The first major repair job for the new facility was the drydocking of the USNS Zeus, a Navy cable-laying vessel, under a $1.8-million contract.

For free literature on the shipbuilding and ship-repairing capabilities of Bethlehem Steel-Sparrows Point shipyard,

Circle 32 on Reader Service Card

Newport News Christens Newest Nimitz Carrier

Newport News Shipbuilding & Drydock Company, Newport News, Va., launched and christened the U.S. Navy's newest Nimitz Class aircraft carrier, the Abraham Lincoln (CVN-72), at recent ceremonies at the yard.

JoAnn Webb, wife of the Secretary of the Navy, **James H. Webb Jr.**, was the ship's sponsor and christened the carrier. The principal speaker at the ceremony was Defense Secretary **Frank C. Carlucci**. Others in attendance included Navy Secretary **Webb**, Chief of Naval Operations **C.A.H. Trost**, Illinois Gov. **James R. Thompson** and shipyard president **Edward J. Campbell**.

The 1,092-foot-long Abraham Lincoln, scheduled to be commissioned in late 1989, will be the Navy's fifth Nimitz Class aircraft carrier, all of which have been built by Newport News. The Nimitz carriers delivered by Newport News to date include the Nimitz, the Dwight Eisenhower, the Carl Vinson and the Theodore Roosevelt.

In addition, the shipyard is building a sixth Nimitz flattop, the George Washington, which is scheduled to be delivered in 1991.

For free literature on the shipbuilding and ship-repairing facilities and capabilities of Newport News Shipbuilding,

Circle 49 on Reader Service Card

Navy Awards $3.7-Million Contract To Continental Maritime

Continental Maritime, San Diego, Calif., has received a $3,677,605 U.S. Navy contract for the Drydocking Selected Restricted Availability (DSRA) of the frigate USS Barbey (FF-1088). The work is expected to be completed April 1, 1988. The contract is N00024-85-H-8212.

Avondale To Perform Destroyer Overhaul For $20.7 Million

The Shipyards Division of Avondale Industries, New Orleans, La., recently received a U.S. Navy contract worth about $20.7 million to perform the regular overhaul of the destroyer USS Radford (DD-968). The work is expected to be completed May 3, 1988. The contract is N00024-85-H-8113.

CLARIFICATION: H.O. Penn Machinery Company wishes to clarify its statement concerning Caterpillar marine generator sets sold to the Navy, which appeared in the Naval Technology & Shipbuilding Supplement of the February issue of this publication. Hawthorne Machinery Co. of San Diego, Calif., was the only Caterpillar dealer involved in this sale. H.O. Penn regrets any confusion or misunderstanding that arose from the omission of this fact.

Avondale Plans Purchase Of Lockheed Shipbuilding's Gulfport Marine Division

Avondale Industries, Inc., New Orleans, La., has signed a letter of intent for the purchase of Lockheed Shipbuilding Company's Gulfport Marine Division, Gulfport, Miss. The purchase price has been set at $21,000,000.

At present, the Gulfport facility has U.S. Navy contracts to construct nine Landing Craft, Air Cushion (LCAC) vessels with a backlog of about $115,000,000 extending through 1991. Avondale intends to continue to produce the LCACs at the existing Gulfport facility.

The transfer of ownership is expected to be completed sometime this month if it is approved by the Government and both companies' boards of directors.

If approved, the Gulfport acquisition would further enhance Avondale's stated intention to be a significant factor in the boat construction market.

Avondale Industries serves the marine, defense and industrial sectors. The divisions of the company build and repair ships and boats, offshore oil platforms and bridges, operate a steel service center and produce steel castings and a variety of industrial fabrications.

For free literature on the shipbuilding and ship-repairing services offered by Avondale,

Circle 35 on Reader Service Card

$7.6-Million Contract Awarded To CDI Marine

Naval Ship Systems Engineering Station, Philadelphia, awarded a $7.6-million contract to CDI Marine Company to provide engineering and technical services for the development and maintenance of NAVSEA Hull, Mechanical and Electrical technical documentation for submarine antenna and hull/deck machinery. The CDI Marine engineering office in Blackwood, N.J., managed by **John Bond**, will provide technical and support services to review, analyze, define, and recommend change and/or revision requirements necessary to update and upgrade the technical manuals.

Free Color Brochure On Safety Release Hook For Rescue Boats

The Danish company Norpol Technic A/S of Grinsted has introduced a totally new type of release hook for all kinds of single-point suspension rescue boats and life rafts.

The Norpol Safety Release Hook is a new concept, consisting of a male and female part, which, when put together, automatically lock. However, the great advantage of the Norpol Safety Release Hook is that release automatically takes place when the rescue boat is floating on the water. Additionally, the hook has a safety stick for manual emergency release.

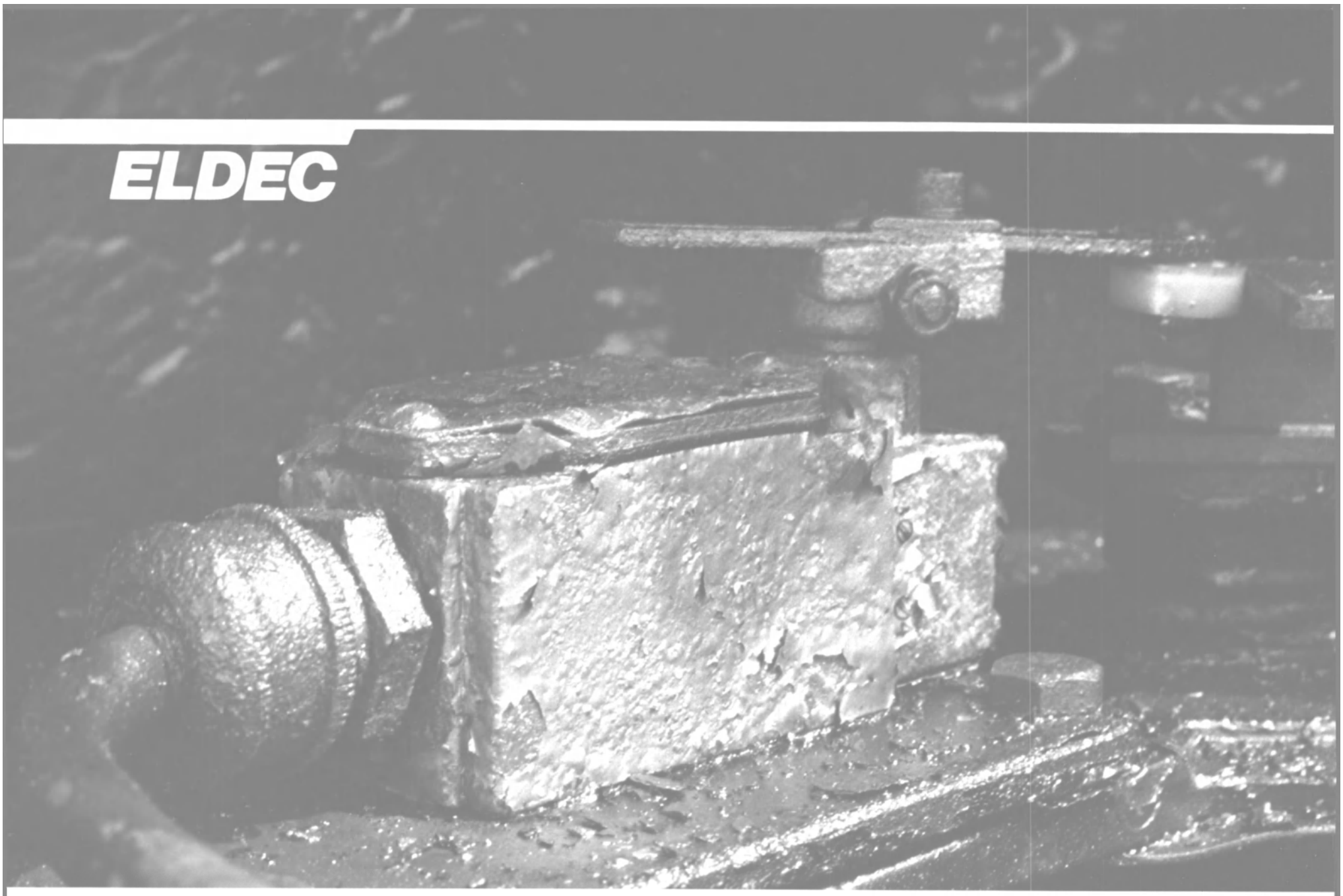
The Norpol safety release hook, type MOB, satifies SOLAS 86, Chapter III for single-point suspension safety release hooks. It has received classification approvals from Det norske Veritas, Lloyd's Register of Shipping and Germanischer Lloyds and from maritime authorities in Denmark, Norway, England and West Germany. Norpol Technic expects approvals in the near future from the U.S. Coast Guard, as well as French, Dutch, Italian, Finnish and Swedish authorities.

Patented worldwide, the safety release hook is produced in three versions—IRB, ILR and MOB. All of these types have safety working loads (SWL) of 1.2 t, 2.1 t and 3.3 t.

The company is working on a similar two-point supension simultaneous release system for larger boats.

Norpol Technic A/S is offering a free color brochure detailing their safety release hook. For your copy,

Circle 104 on Reader Service Card



TIME FOR A SWITCH...

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

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

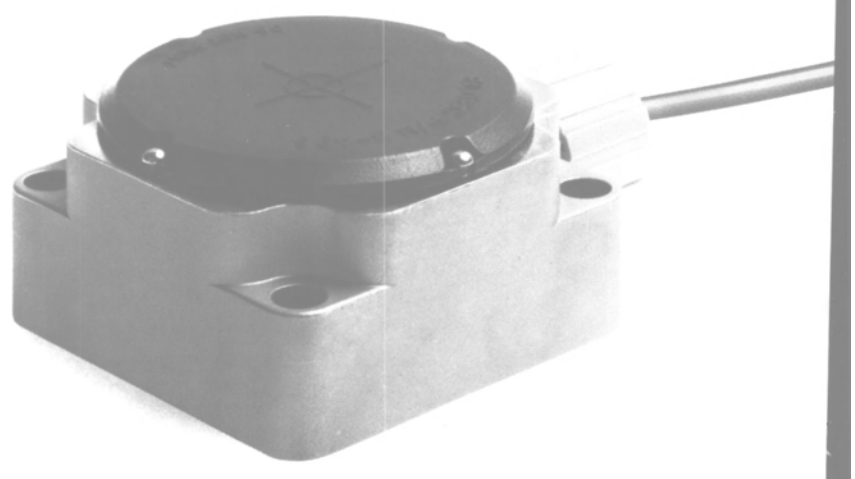
ELDEC non-contacting switches can stand up to the sea.

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

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

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

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



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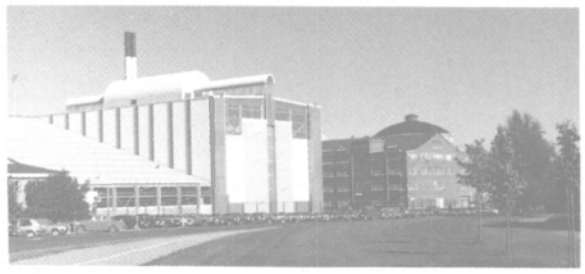
Wartsila Diesel's Big Engines Get New Production Facilities



Wartsila Diesel's latest investment, the new assembly and testing facilities in Turku, Finland, will be used for production of license engines and the company's new medium-speed Vasa 46 engines.

Wartsila Diesel's new assembly and testing facilities in Turku, Finland, were completed and inaugurated early this year.

The new facilities represent the latest technology available and allow maximum quality control and flexible working methods throughout the entire production process. The engine types that will be assembled and tested in these facilities are the Sulzer, Pielstick and MAN B&W engines produced on license by Wartsila Diesel in Turku, and the company's powerful new medium-speed engine, the Vasa 46. The first Vasa 46 will be delivered to the customer in June this year and several additional deliveries are scheduled for 1988 and 1989.

Wartsila Diesel's two other medium-speed Vasa engines, the Vasa 22 and 32, are manufactured by Wartsila in Vasa, Finland, in France, Spain and in Singapore, and under license in Korea, Indonesia and Brazil. The company also has production plants in Sweden and Norway.

For additional information and free literature on Wartsila engines,

Circle 70 on Reader Service Card

Powered by two Electro-Motive diesel engines, the U.S. Enterprise is the first American vessel designed and built to catch pollock and process surimi. She was built by Halter Marine, Inc.

First U.S.-Built Surimi Catcher/Processor Delivered By Halter Marine

The U.S. Enterprise, reportedly the first American vessel designed and built to catch pollock and process surimi, has been delivered by Halter Marine, Inc., New Orleans, to the Arctic Alaska fleet, Seattle, Wash.

The 224-foot, 36-crew member, floating factory will be able to catch up to 250 tons of pollock per day, and process 50 tons of surimi, a paste-like substance made from pollock used to make imitation crab meat, shrimp, and other seafood products. U.S. surimi consumption increased from 6 million pounds in 1981, to over 100 million pounds in 1986.

Approximately five tons of fish are required to make one ton of surimi. The fish is filleted and skinned before mincing and washing as opposed to the Japanese system which scales and splits the fish while leaving the skin on.

The "American" method according to **Francis Milller,** chairman of Arctic Alaska, greatly reduces the amount of potable water required to produce surimi. The Japanese method consumes from eight to 12 pounds of water per pound of surimi, while the American system uses about five pounds of water for one pound of surimi.

The U.S. Enterprise has more than double the water making capacity required as it is equipped with an Atlas (Danmark) 110,000 gallons per day, three-stage evaporation type water maker.

The boat, which was built at Halter's Moss Point, Miss., shipyard, was originally intended for use in offshore oil and gas fields. However, when the vessel was still under construction, Mr. **Miller** saw her potential as a catcher/processor and he and the Halter design team redesigned it for its new use.

The U.S. Enterprise is 224 feet in length, with a 42-foot beam, and 16-foot depth. She is powered by two General Motors EMD 16-645C diesel engines developing a total of 3,900 hp through Reintjes WAV 2660 reverse/reduction gears with a ratio of 5.526:1.

The big diesels drive two Coolidge, five-blade, 118-inch diameter by 130-inch pitch, stainless steel propellers in Kort nozzles.

The U.S. Enterprise was fitted with a Westfalia model OSA 7 centrifugal purifier from Centrico. The unit, which is used to clean up the vessel's diesel fuel, was supplied to Halter Marine by Marine Engineering of New Orleans in a "Centri-Pack." The package consists of a skid or platform including the VESA automatic timing unit as well as other elements.

Electrical power for the Baader 182 and 190 filleters and skinners, other processing machinery, refrigeration, and ship's hotel service, is provided by three Detroit Diesel 380-kw generators driven by three Detroit Diesel 12V71T engines.

A fourth 12V71T engine powers a Schottel S300L bowthruster for increased maneuverability.

After processing and packaging, the surimi is placed between refrigerated plates and quick frozen. The boat's 48,000 cu. ft. refrigerated holds can store up to 1.5 million pounds of surimi.

The mid-water and bottom trawler is equipped with two Alaska Marine net cranes and two net reels.

Her large pilothouse includes two control stations with one overlooking the aft, business end of the vessel. Some of the navigation and communications equipment on board includes two Furuno radars, two VHF and two SSB radios, and a Sperry gyrocompass and autopilot.

The $15-million U.S. Enterprise is the seventh fishing vessel built or converted by Halter Marine's Moss Point, Miss., shipyard for **Francis Miller** interests.

For free literature on the shipbuilding and ship-repairing facilities of Halter Marine and other Trinity Industries shipyards,

Circle 65 on Reader Service Card

US ENTERPRISE
Equipment List

Main engines (2)	EMD
Generators & engines	Detroit Diesel
Bowthruster engine	Detroit Diesel
Reduction gears	Reintjes
Bowthruster reduction gears	Twin Disc
Propellers	Coolidge
Strut, stern tube & rudder bearings	BFGoodrich
Bowthruster	Schottel
Engine controls	Hynautics
Steering controls	EMI
Muffler	Riley-Beaird
Main switchboard	Continental
Engine alarm system	SSI
Distribution panels	Continental
General alarm system	Henschel
VHF radios	ICOM
SSB radio	Stephens
SSB radio	Skanti
Radars	Furuno
Compass	Sperry
Loran	Furuno
Autopilot/gyrocompass	Sperry
Depth sounders	Furuno
Batteries	Delco
Charger	Lamarche
Net recorder system	Ross
Clocks & barometer	Chelsea
Air horn	Kahlenberg
Waste heat boiler	Atlas
Bilge & ballast-washdown pump	Durco
Bilge, ballast, fire & F/O pump	Goulds
F/O transfer pump	Viking
F/O centrifuge	Centrico
F/O strainers	Hayward
Float gauges	Rochester
O/W separator	Sigma
Pressure set pump	Meyers
Watermaker	Atlas
Sewage pump	Hydromatic
Hand winch	Olympic
Manholes	Halmar
Hatches, watertight doors & port lights	Centex
Crane	Alaska Marine
Chocking system	Philadelphia Resin
Fans	Hartzell
Trawl Winches	Skagit
Cod end hoist winch	Gearmatic
Net reels	Alaska
Gilson winches	Gearmatic
Anchor windlass	Fritz Culver
Ramp roller	Halter
Expansion joints	American Boa
Air compressors	Quincy
Air receivers	Manchester
Search lights	Carlisle-Finch
Filleters & skinners	Baader
Paint	International

John Alexander, COMSAT, Moves To New Location

COMSAT Martime Services recently announced that **John Z. Alexander,** assistant director of marketing for COMSAT, has moved to a new location.

The new address is: **John Z. Alexander,** COMSAT Maritime Services, 281 Highway 79, Morganville, N.J. 07751, telephone (201) 591-0899.

(continued from page 24)

bill more amenable to the Senate. As a result, AWO testified before that Committee and the House Public Works and Transportation Committee stating that the pending legislation, H.R. 1632, cannot be supported because the bill fails to fully preempt state laws and requirements in the event of an oil spill; encourages the filing of speculative claims for economic damages by encouraging anyone with a remote connection to a spill to file a claim; allows payment of natural resource damages beyond those legitimately incurred for replacement or restoration; and, allows the calculation of assessment of damages based on a computer model rather than on actual replacement or restoration costs.

Despite House efforts to force a conference between the two chambers by including H.R. 1632 in the omnibus budget reconciliation measure, the Senate Environment and Public Works Committee refused to consider oil-spill legislation during 1987. The House Merchant Marine and Fisheries Committee leadership will renew efforts to enact a bill during 1988. AWO will continue its efforts to strengthen H.R. 1632's preemption and to reduce the scope of damages compensable under the bill.

In 1987, members of the Senate Environment and Public Works Committee and the House Energy and Commerce Committee began consideration of sweeping amendments to the Clean Air Act, generated in large measure by the need to extend the December 31, 1987, deadlines contained in the current Act. Under these deadlines, municipalities which fail to comply with standards for ozone and carbon monoxide levels face a variety of punitive sanctions. The House bill is still under development, with a markup scheduled for the week of February 8, 1988. The Senate proposal, S. 1864, would mandate new and onerous requirements for most industries in order to achieve further reductions in air quality, regardless of the feasibility, effectiveness and economics of the new requirements. While few of these requirements specifically reference the marine industry, certain generic provisions in the bill would require significant changes in operating practices.

AWO is currently conducting a thorough analysis of both the Senate bill and the various House proposals, and will be actively participating with industry coalitions established to improve the legislation. ■

Lexair Offers Catalogs On 'Hi-Cyclic' And Poppet Type Two-Way Valves

Lexair, Inc. of Lexington, Ky., fluid power specialists, are offering free catalogs on two products marketed by the company: "Hi-Cyclic" hydraulic and pneumatic directional control valves; and poppet type two-way valves.

The Hi-Cyclic valve has been produced for over 35 years and is the most versatile design for performance and dependability, fast response and high cycle reliability. The exceptionally fast response is due to short spool travel and virtually friction-free motion of the spool. The key to versatility is the modular component design, combined with nine standard spools, mounting options and a variety of operators: manual, mechanical, solenoid and pilot.

Lexair poppet type valves provide high flow, positive shut-off operation. Bubble-tight shut-off is accomplished by an exclusive poppet seat design that has a long-lasting, extrusion-resistant seal. Ease of maintenance is another important feature, with quick access to valve internal parts without the need for removing in-line piping. Valve construction is a bronze body, with brass and stainless steel internal parts.

Both catalogs are well illustrated with photos and drawings, and contain information on specifications, dimensions, model numbers, etc.

For more information and free copies of the catalogs from Lexair,

Circle 99 on Reader Service Card

Navigation & Communications Equipment Review

Through technology advancements, the major manufacturers of shipboard electronics are constantly introducing innovative products in an effort to make navigation safer and more precise and communications faster and easier.

Newer, more powerful lorans, radars, radiotelephones, weather chart recorders, navtex receivers, ARPAs, hand-held phones, etc. with state-of-the-art, cost-effective features continue to be introduced in the marine market.

In an effort to sort out some of these new choices, Maritime Reporter has asked a number of major manufacturers of shipboard navigation and communications equipment and services to tell us about their latest products. The following review is based on information we had received at press time.

FOR MORE INFORMATION

To receive free literature detailing any of the high-tech products described in this review, circle the appropriate reader service number listed under each company's name, using the postage-paid card bound into the back of this issue.

ALDEN

Circle 10 on Reader Service Card

Alden Electronics, Inc., Westboro, Mass., recently introduced the low-cost Alden Faxmate™ Weather Chart Recorder.

According to **Armand Bouchard,** Faxmate product manager, Alden is introducing the Faxmate to provide an economical means for all mariners to be able to acquire vital weather and oceanographic charts while underway. As an added bonus, the Faxmate can double as a printer for an on-board computer.

Designed to operate with any HF or ham radio, the Faxmate provides mariners with surface analyses charts which show current locations of storms as well as prognoses which predict the indicated speed and direction of these storms. Also, satellite pictures are available in certain areas, showing cloud cover patterns enabling the mariner to track hurricanes and tropical storms. Many transmit sites now broadcast sea surface temperatures, mixed layer depth and the location of warm and cold water eddies which are so helpful in locating various species of fish.

The Faxmate complements Alden's current line of Marinefax recorders which have won the coveted National Marine Electronics Association Award for reliability and performance for the last eight consecutive years.

COMSAT MARITIME

Circle 25 on Reader Service Card

COMSAT Maritime Services, headquartered in Washington, D.C., is one of two Communications Satellite Corporation rate-regulated businesses that make up the World Systems Division. COMSAT Maritime Services provides satellite and earth station services to ships at sea and offshore oil platforms for telephone, telex, data, and video communications via the International Maritime Satellite Organization (INMARSAT). COMSAT Corporation currently holds approximately 28 percent ownership interest in INMARSAT, and COMSAT Maritime Services carries out the company's responsibilities as U.S. Signatory to this international organization.

COMSAT Maritime Services provides satellite communications services to ships at sea virtually anywhere in the world through two U.S. coast earth stations located at Santa Paula, Calif., and Southbury, Conn.

Other services recently developed and offered by COMSAT Maritime Services include daily news digests, credit card telephone calls, cash advances from credit cards, live television and radio broadcasts, group calls in which the same message is sent to many ships simultaneously, and access to computer data banks on shore via packet-switched networks.

Customers include: passenger liners; shipping, fishing, oil and mining interests; and pleasure-boaters.

In 1987, COMSAT Maritime Services handled more than 510,000 telephone calls and 2 million telex messages to ships at sea and offshore facilities.

FURUNO

Circle 11 on Reader Service Card

Furuno USA, Inc., South San Francisco, Calif., recently introduced three marine navigation products—a GPS navigator, a dual frequency color video sounder and an ultra-compact radar.

Furuno's new GP-300 navigator operates as a fully functional NAVSTAR system, yet compensates for the current limited satellite availability by using a hybrid system whereby the operator can choose another navigation system, such as loran C, Transit satellites, or speed log/gyrocompass, as backup and the unit automatically updates position data as soon as the GPS data is available.

The GP-300 provides digital readouts for latitude and longitude, speed/course, range/bearing, ETA/TTG to a waypoint, waypoint details, and local or GMT date and time. Up to 10 Event marks and 20 waypoints may be entered, and audible alarms are provided for cross-track error, arrival border approach, and anchor watch.

The FCV-261 is a dual frequency, 1,000-watt, eight-color machine with six basic ranges factory set to 1,000 feet, but customizable to 3,000 feet by the user. Phasing is in 1- or 10-foot steps depending on range scale in use. A high resolution 10-inch CRT shows any of six presentation modes that permit the user to see various combinations of high, low, or mixed frequencies, and six bottom lock ranges appear on the lower third of the screen.

The FCV-261 also has built-in memory capable of holding a full page of data, fish and bottom alarms, and choice of 6 different combinations of frequencies from 28 to 200 kHz.

Furuno's new FCV-261 is a tremendous step forward in fishing database management, permitting enormous amounts of critical information to be displayed on a convenient single CRT screen.

Furuno's new Model 1720 ultra-compact full featured radar provides a steady, daylight-bright picture on a 7-inch-high resolution CRT, offers the company's no-compromise multilevel quantization, has built-in EBL, VRM and Electronic Guard Zone, is fully splash protected, and has Furuno's super-sensitive custom microwave IC receiver.

It also has a unique feature—today's marine electronics industry; a compact, rugged radome antenna *weighing less than 10 pounds.*

The Model 1720 has Furuno's traditional commercial quality and performance features in a package that will truly fit any size vessel.

HARRIS

Circle 21 on Reader Service Card

One of the latest products from the Harris Long Range Radio Division is the RF-3200, a new generation HF-SSB radio that incorporates many technical innovations.

According to the firm, the outstanding difference between the RF-3200 and other HF-SSB radios is the operating simplicity of the Harris unit. A single convenient knob tunes all frequencies and channels. Pushbutton entries are kept to a minimum. It has nine different programmable scan groups, with no practical limit on the number of channels in each group. All data is protected in non-volatile memory so it is not necessary to reprogram or re-enter data every time power is disconnected.

Another important technical advance is the use of a single multiplexed coaxial cable to the antenna coupler, which eliminates the requirement for the usual multi-conductor control cable. This coax supplies electrical power to the coupler and also provides two-way digital communication between the coupler and transceiver. This saves time and money in installation and, more importantly, improves performance in the field.

The RF-3200 operates in the 1.6 to 30 MHz range. It can also be tuned to receive down to 500 KHz for monitoring Navtex broadcasts. Standard output is 125 watts. With the addition of an optional solid-state linear power amplifier, the unit can provide 1-kw power output.

HENSCHEL

Circle 12 on Reader Service Card

Henschel Corporation, Newburyport, Mass., a unit of General Signal, is a leader in designing, developing and manufacturing ship control and monitoring systems for both Navy and commercial vessels. For more than 60 years, Henschel has supplied reliable equipment to meet the unique demands of the marine evnironment.

One recently developed product from Henschel is a new announcing system designed for medium and smaller military vessels. The system features a combined 200-watt audio power amplifier and system control unit, using modular construction designed for a larger system now in use on aircraft carriers. The system also incorporates voice processing, new design microphone control stations, and both high power and medium-power loudspeakers. The system can be reconfigured to suit any type of vessel.

Some of Henschel's other products include engine order telegraphs, wheelhouse consoles, sound-powered telephone systems, ship control and monitoring systems (for both surface and submarine vessels), ship's course indicators, bell loggers, whistle timers, throttle control levers, engineer's alarm panels, shaft speed indicator system navigation light panels, fire alarm systems, audible signals, digital master clock systems, synchro-signal amplifiers and rudder angle systems.

HULL ELECTRONICS

Circle 14 on Reader Service Card

Hull Electronics Company, San Diego, Calif., recently introduced the model 230 SSB Radiotelephone which offers complete frequency coverage from 1.6 to 30 MHz with

channel selection by keyboard. A large selection of factory-programmed channels is provided including all of the high-seas telephone (ITU) and ship-to-ship frequencies. In addition, the user may add up to 200 channels to suit individual needs.

The model 230 is suitable for use with radio-teletype (ARO) equipment and offers a full 150 watts PEP output. Operation is from any 12-volt DC source or from a 115 VAC source with an optional built-in converter.

Provisions have been made in the unit to scan up to 10 channels of the user's choice. Scanning can be interrupted either from the keyboard or remotely.

A plug-in module is available to provide the standard two-tone emergency alarm broadcast. A second optional module permits full break-in CW operation.

A new automatic antenna coupler, Hull model H-403CU, is offered to permit operation with typical marine antenna systems.

KRUPP ATLAS ELEKTRONIK

Circle 29 on Reader Service Card

Krupp Atlas Elektronik has introduced the low-priced Atlas 5400, a 12-inch conventional display relative motion radar to complement its current range of 12- and 16-inch rasterscan systems.

Suitable for either stand-alone installation or integration with other systems, the Atlas 5400 combines high-resolution display facilities with simplified LED-type data presentation.

Three display modes are available, head-up, course-up and North-up, together with an off-center capability of up to half of the display radius. Other advanced features of the Atlas 5400 include a VRM with digital readout and a ship-oriented EBL, centered or movable with digital display or absolute bearing.

The Atlas 5400 complies with IMO requirements as well as other major specifications. It operates over a series of nine phased ranges from 0.3 to 72 nautical miles. The unit is available with an X- or S-band transceiver and antenna. The system can be interswitched with other Krupp Atlas Elektronik systems such as the Atlas 5600, 7600 and 8600 rasterscan radars for cross connection or master/slave operation. The unit also includes a performance monitor for the transceiver as well as comprehensive built-in self-check functions for added reliability.

The Atlas 5400 is available with either an 8-foot or 14-foot slotted array antenna for X- or S-band operation. Its corresponding transceiver output is 25 kw and 30 kw.

MACKAY

Circle 23 on Reader Service Card

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

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

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

The unit's all-channel, solid-state, linear amplifier (1020M) provides 1000 watts RF power to the automatic antenna coupler (4030), and automatic power reduction to 125 watts for all frequencies below 4MHz.

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

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

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RDI

Circle 27 on Reader Service Card

Radar Devices, Inc.'s advanced automatic radar plotting aids series RDI ARPA I and RDI APRA IV significantly reduce costs of installing collision avoidance radar systems aboard all vessels of more than 15,000 gross registered tons to meet International Maritime Organization's (IMO) September 1988 deadline. Ships' owners realize these cost savings when they retrofit RDI ARPA I or RDI ARPA IV to their ships' existing radar instead of buying expensive new radar systems with costly built-in collision avoidance systems.

RDI ARPA I is one of the world's most economical add-on ARPAs that puts computer-generated ARPA symbols and vectors on almost any marine radar display, meeting IMO's requirements. The easy-to-use system is interswitchable between two existing radar displays and offers a 10 or the new GA-20 target tracking system with manual, semiautomatic or full automatic guard zone acquisition, with Radar Devices' patented Guard Zone warning alarm.

With its own very bright 16-inch CRT, the RDI ARPA IV is one of the lowest cost full-size ARPAs available. The basic 20 target RDI ARPA IV system automatically tracks radar targets which are acquired manually, semiautomatically or automatically by Guard Zone System. The radar information is displayed in the form of target echoes, track symbols, history points and vectors. In addition, the RDI ARPA IV is designed to serve as a second display or simply be an ARPA add-on to a ship's present radar.

RACAL

Circle 15 on Reader Service Card

The Racal Corporation, a leader in telecommunications and data communications, defense electronics, security, avionics and marine electronics, electronic design automation, instrumentation and recorders, health and safety, serves the marine industry through Racal Marine in New Jersey, Racal-Decca Canada in Ontario and Racal Survey in Texas.

Aboard nearly every type of vessel, from pleasure craft to large, oceangoing tankers, Racal marine navigations systems, radar and instrumentation are in use. Racal produced one of the world's first production color automatic radar plotting aids, which reduces the workload and stress on a bridge, making a major contribution to safety at sea.

The company is also a major producer of hydrographic and offshore positioning systems that profile bodies of water, aid in the dredging of rivers and harbors and offer computerized positioning for naval ships engaged in mine countermeasures.

More than 90 countries have purchased Racal's marine electronics packages for their navies. These packages combine radar, precise positioning, navigation and marine automation systems. Additionally, Racal supplies highly specialized equipment to the NATO Alliance's antimissile submarine program.

Service is indispensable in the marine industry. Shipowners can be assured of dependable Racal service, with service teams located in virtually every major coastal and inland port. Some 200 dealers provide additional support.

RADIO-HOLLAND

Circle 19 on Reader Service Card

The Distributor Products Division of Radio-Holland USA, BV, Houston, Texas, is the North American distributor for several companies, including Thrane & Thrane of Denmark and Anschutz.

Anschutz has developed the microprocessor-controlled navigation and maneuvering system Nauto Control for the ship's command centers of highly automated "ships of the future."

The central development goal for the Nauto Control system was the integration of all subsystems and sensors essential for navigation into one functionally closed total system. The system consists of sensors—gyrocompass, rate gyro, log systems,

magnetic compass and position receivers; a computer-controlled heading reference management system called Nautocourse; course controllers—a digital autopilot Nautopilot D and an adaptive autopilot Nautopilot A; a track controller—Nautotrack; an automatic chart table—Nautoplot; and a manual steering control called Nautosteer.

In this system configuration, the track planning is carried out by the chart table Nautoplot. The data relevant to track control are transmitted to the autopilot and followed up automatically. The current ship's position is shown in the form of a light-spot on the sea chart and additionally as position coordinates on an alphanumerical display. Thus the Nautoplot simplifies and automizes the important functional procedures for the ship's command, while achieving optimal use and integration of the required nautical information system "sea chart."

RAYTHEON MARINE

Circle 28 on Reader Service Card

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

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

(continued)

cent in height and, at 242 pounds, about 33 percent in weight.

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

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

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

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

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

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

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

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

RAYTHEON SERVICE

Circle 101 on Reader Service Card

Raytheon Service Company, Marine Sales and Service Division, is a full-service, one-stop source for sales, service, installation, maintenance, overhaul and supplies for marine navigation, communication and electronic equipment and systems of all types. The company operates from eight U.S. port offices which serve all ports and shipyards either at pierside or anchorage.

Raytheon Service Company has been serving the maritime industry for over a half-century. Worldwide customers operate ships and vessels of every type: commercial cargo, passenger, military, government, commercial fishing, workboats, oil drilling and exploration, dredging, hydrographic and ocean survey, yachts and pleasure craft.

The company sells and services equipment manufactured by a broad variety of producers including the full Raytheon Marine product line. This diversity is apparent in recent agreements between Raytheon Service Company and other major manufacturers of marine electronic equipment. These agreements involve full sales and service dealerships for all eight locations to represent Odom Hydrographic Systems with their survey equipment and Magnavox Marine and Survey Systems Division for the full Magnavox line of marine navigation and communication products.

The company offers 24-hour, seven day a week service that extends to any area of the world. Raytheon Service Company provides an extensive depth of experience; its field engineers have built a reputation for service excellence, dependability and responsiveness that go beyond a ship's navigation bridge and communications center—reaching from the top of the mast to the keel, and from stem to stern, encompassing a variety of shipboard monitoring and control systems. The entire staff embodies the company-wide commitment to mastering the fundamentals and then consistently applying them to solve complex problems.

Raytheon Service Company, Marine Sales and Service Division, is a separate operating division of Raytheon Company, Lexington, Mass.

ROBERTSON-SHIPMATE

Circle 16 on Reader Service Card

Robertson-Shipmate, Inc. offers a full range of Robertson autopilot/vessel control systems and Ship-

←Circle 183 on Reader Service Card

mate satnav, GPS and Navtex navigation products.

Recently, Robertson upgraded the software and hardware of its service-proven AP9 autopilot and renamed it the AP9MKII. The upgraded unit's software simplifies operation and increases the system's efficiency. While still able to maintain highly precise steering control, the AP9MKII will now also accept navigation input directly from a satnav receiver as well as a loran. It can automatically sense type of heading sensor used and provide improved rate of turn control and can drive as many as six rudder angle indicators. Options include follow-up or non-follow-up steering levers, watch alarm, dual station installation, AC power supply and control of both the rudder and bowthruster to maintain set heading at very low speeds or for precise maneuvering.

The Shipmate RS6101 Navtex Receiver provides a full range of weather and safety information automatically with free choice of transmitter stations. The RS6101 has only four control keys to insure simple, reliable operation. All additional functions are performed via a printed menu that describes required operator responses.

The company is now offering the new RS5200 "black box" receiver which can be added to the Shipmate RS5100 SatNav receiver to upgrade it to complete GPS compatibility. The RS5200 senses when a reliable Navstar signal is available, switches over to the GPS mode, then switches back to Transit satnav reception—all automatically. Navigation data is shown on the existing RS5100 display. This is a completely hands-off procedure. As soon as GPS coverage is complete, estimated to be sometime in 1991, the RS5200 will become a 24-hour-a-day, worldwide navigation system.

For vessel maneuvering, Robertson-Shipmate offers the Robertson Commander vessel maneuvering system, which integrates control of the thruster and main engines into a single, three-axis joystick and may be used in lieu of all other engine and rudder controls. The system is supplied as a comprehensive main control station, containing three sub units—a joystick control module, an advanced autopilot and an engine select/thruset display module.

Robertson-Shipmate also announced that they are expecting FCC approval shortly for their RS7100 full duplex commercial VHF radiotelephone system.

SIMRAD

Circle 17 on Reader Service Card

Simrad, Inc., Seattle, Wash., a leading supplier of hydro acoustics, navigations systems, radio-direction finders, ocean data systems and platform instrumentations to the marine industry, recently introduced the TL-900, a high-performance, commercial grade loran. Some of the TL-900's outstanding features include a large LCD display which shows present position and navigation functions simultaneously, automatic ASF correction and magnetic variation, 99 waypoints, 10 different routes with route following, four different alarms and data output in NMEA format.

The unit has been tested in some of the worst loran-C coverage areas in the U.S. and the company has found it to be a top performer in terms of settling time, signal acquisition, tracking and user friendliness.

SI-TEX

Circle 18 on Reader Service Card

The full-featured A-310 Satnav System from Si-Tex, Clearwater, Fla., offers the same operational performance as that used by large oceangoing vessels, but at a fraction of the price. Multiline display on backlighted screen presents a wide range of navigation data including: Present Latitude and Longitude position, speed, heading, GMT and date, plus information on up to 20 previous satellite-fix positions and 20 future alerts. Additional displays include: Course-to-steer along with time and distance to waypoint, speed made good (SMG) and course made good (CMG).

Other features include: A 99-waypoint memory, Great Circle or Rhumb Line courses, true or mag-

(continued)

netic headings, arrival alarms, an instant-position memory and a "sleep" mode to conserve battery power.

Built-in manual dead-reckoning course computer, using speed heading set and drift information, provides continuously updated positions between satellite fixes.

Drift speed and direction (Drift Set) can be entered manually or automatically computed using two successive satellite fixes. In automatic mode, drift data is automatically updated at each satellite fix.

For automatic positioning between fixes, an interface for flux gate compass, speed log and Loran-C receiver is optionally available. Interface for serial hard copy printer is also available.

SP RADIO

Circle 22 on Reader Service Card

S.P. Radio A/S has just introduced a new VHF radiotelephone for the marine industry called the Sailor RT2048.

The VHF Sailor RT2048 is a simplex/semi-duplex station for ship-to-ship/ship-to-shore communication. It is equipped with all 55 international maritime VHF channels, U.S. channels, 10 private channels, scanning facilities, quick channel 16, dual watch, 25-watt output power, and built-in seacall as an option.

Due to the unique construction of its transmitter and heat sink, the RT2048 is able to operate with a continuous output power of 25 watts on all possible channels in the frequency range 154.40-163.75 MHz. The unit also offers a choice of 30 additional private channels or scanning facilities.

The Sailor RT2048 is prepared for connection to 12V DC or 24V DC (by means of a Sailor N420 Power Supply). The set has an extremely low power consumption. In the standby mode, the power consumption is less than 0.1 a.

The new compact state-of-the-art VHF is fully transistorized and equipped with a synthesizer and microprocessor. Its compact cabinet houses both transmitter, receiver and a large, powerful 6-watt loudspeaker, which reproduces the signal loudly and clearly—even at great distances. Furthermore, the built-in audio amplifier is capable of delivering an additional 6 watts into an external loudspeaker.

And although the Sailor RT2048 is compact (height-104 mm; width-228 mm; and depth-169 mm), it is easy to service, since the set consists of four easily replaceable modules.

This high-quality, low-priced unit is easy to operate, even in bad weather, due to a button for continuous turnstyle operation of squelch and AF levels. All controls are easily accessible on the front plate with pushbutton keyboard, LED display and nighttime illumination.

SPERRY MARINE

Circle 26 on Reader Service Card

Sperry Marine Inc., a subsidiary of Newport News Shipbuilding, was selected to supply the radar/ARPA, navigation workstation, global positioning and gyrocompass systems for the Swedish icebreaker Oden II.

The Oden II's radar/ARPA system is based on Sperry Marine's newly introduced RASCAR (Rasterscan Collision Avoidance Radar). Four complete RASCAR systems (three X-Band and one S-Band), a fifth radar display and two slave monitors were supplied in a fully interswitched system. The RASCAR was selected primarily because its superior display picture quality and resolution were deemed absolutely vital for ice detection.

All RASCAR displays will be controlled through a touchscreen mounted on the surface of the display. The speed, accuracy and simplicity of this user/machine interface were also major considerations for the Oden II's complex radar system.

Sperry will also supply a navigation workstation based on its ruggedized marine PC model MC 500. This computer recently received certification for cargo loading applications from Det norske Veritas, Lloyd's, Germanische Lloyd and Bureau Veritas. The workstation will allow Oden II's bridge staff to digitize charts and develop voyage plans for display as overlays on the radar displays. When printed out on the flat bed plotter, hard copies of

the plan can be distributed to her envoy.

Sperry is also supplying a high-reliability MK 37 gyrocompass system, as well as a 501 TR/GPS navigator. The 501 TR/GPs is designed to automatically select the best position source—transit or GPS satellites—and provides the operator with an unambiguous, completely integrated navigation package.

Sperry Marine Inc. is a major manufacturer of marine navigation equipment and control systems and a leader in radar and collision avoidance systems for all types of vessels.

STANDARD COMMUNICATIONS

Circle 20 on Reader Service Card

A more powerful, completely updated 6-watt version of Standard Communications' popular Horizon Hand-Phone portable radio is now available.

The Hand-Phone 6 features 160 channels in the microprocessor including 55 U.S., Canadian and International channels, 10 weather channels and 95 expansion channels (when allocated by the FCC). "This assures that the Hand-Phone will never be out of date," **Ken Ungar,** marine products division vice president said.

Added watertight integrity is made possible by heavy case gasketing, use of fewer operating controls, and sealing of internal circuits. "Fewer, logically designed controls, also make the Hand-Phone 6 very simple to operate," Mr. **Ungar** said. Push buttons provide direct-selection of up or down high-speed scan, channel 16 or weather channels, high and low power (the unit provides automatic power down on FCC required channels), U.S., Canadian or International channels, and programmable scan memory. The large, backlit LCD display shows channel, power mode and frequency band.

The Hand-Phone 6 measures 2½″W x 1½″D x 7″H and weighs slightly more than 1 pound. It has lifetime protection with a one-year warranty covering all parts and labor. Additional protection is available under Standard's lifetime service plan, which guarantees out-of-warranty repairs at a low flat-rate charge.

STANDARD RADIO

Circle 102 on Reader Service Card

Standard Radio & Telefon AB of Vallingby, Sweden, offers the PNW900 Navtex receiver. This Navtex receiver has dual channels for national and international transmissions.

All ships over 300 gross tons must be equipped with a new Navtex receiver by February 1, 1990. The Navtex system, which has coverage in the U.S. ranging from the New England area to the Gulf of Mexico, transmits 24-hour warnings of navigational and weather conditions. The Coast Guard expects that total U.S. coverage will be provided by the Navtex system by late 1989.

VIGIL

Circle 30 on Reader Service Card

Vigil Marine Systems, a division of Mars Electronics, West Chester, Pa., has announced the addition of a new navigational system utilizing GPS and satellite navigation technologies to its line of electronic navigation instruments. The new Vigil RX GPS Satnav combines the established capabilities of the Vigil RX Satnav with a proven GPS receiver and antenna to introduce the VIGIL RX GPS Satnav.

The Vigil RX GPS Satnav utilizes its dual capabilities to receive signals from both Transit (U.S. military) and GPS (Global Positioning System) satellites to locate vessels anywhere in the world. In the Northern Hemisphere, for instance, the instrument receives GPS satellite signals for up to 18 hours daily, with Transit satellites filling in the balance of time to provide 24 hour-a-day positioning and course information.

The GPS receiver component is designed and built to U.S. military specifications. The Satnav component is the same RX Satnav, introduced last year. By combining the capabilities of both instruments into the GPS Satnav, Vigil has de-

(continued on page 58)

ELECTRONICS UPDATE

Robertson-Shipmate Introduces Multi-Station VHF Radiotelephone To U.S. Marine Market

—Free Literature Offered—

Robertson-Shipmate, Inc., Hauppauge, N.Y., has just introduced in the U.S. a new multi-station commercial VHF radiotelephone, the RS-7100, for the marine market.

According to the company, the new RS-7100 VHF radiotelephone is a heavy-duty commercial grade system that permits use of up to six full-function remote stations. Extremely popular in Europe, the RS-7100 is now approved for use in the United States. This is a full duplex radio, with dual watch, designed primarily for commercial applications such as larger ships, drilling platforms and workboats, but it is also said to be ideal for the largest yachts.

The RS-7100 is a synthesized radio with all U.S., International and Weather channels. System functions are controlled through a splashproof keypad, and selected channels and operating functions are displayed on a backlighted LCD. Construction is of diecast aluminum and the unit can be mounted on tabletop, bulkhead, or 19-inch rack. Remote stations are extremely compact and have control panels identical to the master station. All stations have built-in internal monitoring and self-test programs.

The system operates from 12 or 24 VDC, as well as 110/220 VAC.

For free literature detailing the new RS-7100 VHF radiotelephone from Robertson-Shipmate,

Circle 76 on Reader Service Card

The new RS-7100 VHF radiotelephone from Robertson-Shipmate was recently introduced in the U.S. Introduced in Europe earlier, the system is already popular there.

New Public Dock Facility At Port Of Iberia Is Reported A Success

The Port of Iberia, New Iberia, La., recently reported that the new public dock facility completed there last year is attracting great interest and is proving to be more profitable than had been anticipated.

The new facility, fronting on the port's Commercial Canal and linking to the Gulf Intracoastal Waterway and Gulf of Mexico, consists of 12 acres of land in the port's waterfront expansion addition, bounded by 18-foot channels on three sides, with 600 feet of bulkheading, concrete slab loading and unloading areas, lighting, potable water, protective fencing, an operations building available for leasing and a steel warehouse, 100 by 150 square feet in area.

A recent addition to the public dock's service capabilities is the availability of a 110-ton-capacity Manitowoc mobile crane which will be kept at the dock to provide lifting and loading services as needed.

In the Port of Iberia's immediate future is the possibility of a $1,610,000 expansion program, with funds provided by the Port Commission, Iberia Parish Council, the State of Louisiana, and the Economic Development Administration (EDA), Austin, Texas. The proposed development will include dredging of additional canals, construction of roads and utilities to serve prime industrial areas.

For free literature giving complete information on the Port of Iberia in New Iberia, La.,

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ON

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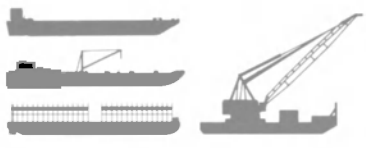

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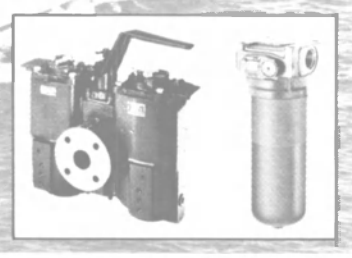

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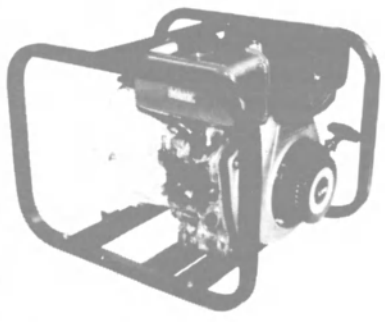

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DYE 1500 5DG	1500 PSI pressure washer	$1795
DYE 3000 PSI	3000 PSI pressure washer	$3795

(Dealer and Reps inquiries invited)

Circle 338 on Reader Service Card

(continued from page 55)

veloped an accurate satellite navigation system that is compact and lightweight.

Added to the Vigil RX GPS Satnav worldwide positioning advantages is its ability to interface with Vigil RX Series Radars through the Vigil RX Supervisor™. The Supervisor accepts all the data inputs from the GPS Satnav, displaying the navigation information on the RX Radar screens.

The technology of the Vigil RX GPS Satnav is also impressive. The instrument allows accuracy to within 75 feet under typical conditions and will handle up to five satellite signals simultaneously. It has all the operating features of the RX Satnav, including Auto-Locate, 99 waypoints plus MOB (Man Overboard), 10 route/25 waypoint storage, and the ability to interface with speed logs and the Vigil fluxgate compass. The GPS Satnav is supported by an internal battery to maintain the instrument's memory during periods of inactivity.

The Vigil RX GPS Satnav joins other Vigil navigation instruments to offer boat owners a wide choice of equipment to suit their needs. Included are the Vigil RM and RX Satnavs, RX Navigator (Decca), and three radar models.

WATERCOM

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Since the first call was placed on a WATERCOM® telephone the system has been installed on the vessels of more than 34 fleets. WATERCOM's network links vessels and their home offices through the only direct-dial, inland marine telecommunications system. Using the WATERCOM telephone, calls can be placed from vessel to shore, shore to vessel or vessel to vessel. Low operating costs make WATERCOM one of the most economical marine communication systems available.

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WATERCOM also features facsimile (FAX) machine capability which allows transmission of hard copy to and from vessels. Deck logs, payroll, crew records and requisitions can now be transmitted. Data communication is also a reality with WATERCOM, giving the vessel owner a number of alternatives for improving operating effectiveness and controlling costs. Other features, including calling cards, collect calls, operator assisted calls and crew phones offer unique crew benefits.

WATERCOM coverage extends along 4,000 miles of inland waterways, including the Mississippi, Ohio and Illinois rivers, as well as the Gulf Intracoastal Waterway. Vessels located anywhere within this coverage area have access to instant, direct-dial communications. ■

Mariner Holding Buys Caruthersville Shipyard

Pott Industries Inc., a subsidiary of Enron Corp. of Houston, Texas, has sold Caruthersville Shipyard Inc. to Mariner Holding Inc. of St. Louis, it was jointly announced by Mariner president **Richard A. Coonrod** and **Dwight E. Larson** of Enron. Caruthersville Shipyard will continue to be headquartered in St. Louis and will operate under the name of St. Louis Ship.

Both St. Louis Ship president **Anthony G. Tobin** and Caruthersville Operations vice president **Larry N. Privett** will remain as part of the management team of St. Louis Ship.

◀ For **Aeroquip** Literature, circle the appropriate number on the Reader Service Card: **Catalog 306—circle 114; Bulletin 8313—circle 115; Bulletin 541A—circle 116.**

BUYERS DIRECTORY

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

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FASTENERS
Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455
Lee Brass Company, P. O. Box 1229, Anniston AL 36202
Non-Ferrous Bolt & Mfg Co., Inc., 3650 W. Russell Rd., Las Vegas NV 89118
FENDERING SYSTEMS—Dock & Vessel
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Schuyler Manufacturing, 16901 Woodinville-Redmond Rd, Woodinville WA 98072
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624
FILTERS
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540
FUEL ADDITIVE
Drew Ameroid Marine, One Drew Chemical Plaza, Boonton NJ 07005
U.S. Borax, Industrial Chemicals, 3075 Wilshire Blvd., Los Angeles CA 90010
FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
GALLEY EQUIPMENT
Gaylord Industries, P.O. Box 558, Wilsonville OR 97070
Greitzer, Inc., 101 Riverdale Rd., Riverdale NJ 07457
GANGWAYS, LADDERS
American Mason Safety Tread Company, 153 Essex St., Haverhill MA 01830
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691
HATCH & DECK COVERS—Chain Pipe
American Mason Safety Tread Company, 153 Essex St., Haverhill MA 01830
HEAT EXCHANGERS
Alfa Laval Inc., 2115 Linwood Ave., Fort Lee NJ 07024
ITT Standard Heat Transfer Technology, Buffalo, NY 14240
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Serck GmbH, Tilsiter Str 90, D-2000 Hamburg 70, WEST GERMANY
HORNS/WHISTLES
Kohlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241
HYDRAULICS
Aeroquip Corporation, 300 South East Ave., Jackson, MI 49203
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc., 207 W Central Ave., Maywood NJ 07607; telex: 132610 DELMARINE
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
The Claremont Company, 174 State Street, P. O. Box 952, Meriden CT 06450
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Soundcoat, One Burt Drive, Deer Park NY 11729
JOINER—Watertight Doors—Paneling—Ceiling Systems
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Dampa Inc., The Gatehouse at North Park, Suite 106-108, Hunt Valley MD 21030
Simpson Timber Co., Third & Franklin, Shelton WA 98584
Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606
KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307
LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Ave., Cincinnati OH 45232
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209
LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
LUBE-OIL CENTRIFUGES
Keith Dixon Warehouse Supplier, Authorized distributor for Spinner II, 650 Whitehead Rd., Lawrenceville NJ 08648
Spinner II Products Div., T.F. Hudgins Inc., P.O. Box 920946, Houston, TX 77292
MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
MEDICAL SUPPLIES
Universal Marine Medical Supply, 69-06 3rd Ave., Brooklyn NY 11209
METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038
NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Combat Systems Engineering & Analysis Corp., 19240 Nordhoff St., Ste 206, P.O. Box 47, Northridge, CA 91324
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
CDI Marine Co., 900 Regency Square Blvd., Suite 203, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants, 15301 First Ave S., Seattle WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
E.Y.E. Marine Consultants, Belmont House, 33 Alderney Dr., Suite 350, Dartmouth, NS CANADA B2Y 2N4
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
JJH Inc., 1101 Kings Hwy, Suite 206, Cherry Hill, NJ 08034
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Korkut Engineers Inc., P. O. Box 7515, Metairie LA 70011
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Clyde Leavitt Inc., 45 Puerto Dr, Ocean Springs, MS 39564
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
R.J. Mellusi & Co., 71 Hudson St, New York, NY 10013
National Association of Marine Surveyors (NAMS), 3450 Baychester Ave., Bronx NY 10475
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Omega Marine Engineering Systems Inc., 11757 Katy Freeway, Suite 390, Houston TX 77079
Pyrotech Technical Institute, Delgado Community College, New Orleans, LA
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sanders & Thomas, Inc., 7900 Westpark Dr., McLean VA 22102
Sea School, 3770 16th Street North, St. Petersburg, FL 33704
Seaworthy Systems Inc., P.O. Box 338, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl., 5203 Leesburg Pike, Falls Church VA 22041.
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
T.W. Spaetgens, 156 W. 8th Ave., Vancouver BC CANADA V5Y 1N2
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
TIMSCO, P. O. Box 91360, Mobile AL 36691
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744
NAVIGATION & COMMUNICATIONS EQUIPMENT
AT&T, 412 Mt Kemble Ave., Room N420, Morristown NJ 07960
Atkinson Dynamics, 10 W Orange Ave., So San Francisco CA 94080
Comsat Maritime Services, 22250 Comsat Dr., Clarksburg MD 20871
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Corporation, RF Communications Group, 1680 University Ave., Rochester NY 14610
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kelvin Hughes Ltd., New North Rd., Hainault, Ilford, Essex 1G6 2UR England
Mackay Communications, 441 US Hightway #1, P. O. Box 331, Elizabeth NJ 07207
Ocean Satellite Televion Ltd., Avmar House, 61 Brushfield St., London E1 6AA ENGLAND
Radar Devices Inc., 2955 Merced St., San Leandro, CA 94577
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Company, 46 River Rd., Hudson NH 03051
Raytheon Service Company, 5740 East Bayside Rd., Virginia Beach VA 23455
Robertson Shipmate Inc., 3000 Kingman St., Suite 207, Metairie LA 70006

Skaarup Shipping Corporation Announces Executive Changes

Skaarup Shipping Corporation of Greenwich, Conn., has announced a number of organizational changes at the executive level.

B.O. Larsen, president, has retired, effective January 1, 1988, **William O. Gray,** formerly of Exxon Corporation, who joined Skaarup in September 1987, will assume the responsibility of the ship management and operations function as executive vice president. Capt. **L.C. Tzou** has been promoted to senior vice president in the ship management and operations division.

Vagn Fausing, who has been with the organization since December 1986, has assumed the role of executive vice president of contracts and commercial administration in the middle of last year.

Ole Skaarup will remain CEO of Skaarup Shipping Corporation.

Other recent changes in the organization include the promotion of **Richard Livingston, Hideo Hara,** and **Donald Frost** to the vice president level, and **Vernon C. Miller** to vice president and counsel. **Stig Farup** will remain senior vice president, and **Frank Parker** treasurer.

Cunard Installs Computerized Maintenance System From MMS Aboard Queen Elizabeth 2

Marine Management Systems (MMS) recently completed implementation of their computerized Planned Maintenance (PMS) system aboard Cunard Line's luxury ocean liner Queen Elizabeth 2 (QE2), according to an announcement made by MMS president, **Eugene D. Story.**

The PMS system, operating on a personal computer (PC), was installed onboard the QE2 in December in cooperation with the Marine Management Centre (MMC) of London, England, during a voyage from Southhampton to New York in order to be fully operational in time for the QE2's world cruise. System setup and training was performed by MMS, while engineering services for system startup were provided by the MMC. All ongoing support for the PMS system will be handled by MMS technical staff in Stamford, Connecticut.

MMS is a leader in providing computerized management information systems for the shipping industry. The PMS system for the QE2 is part of MMS' Ship Management Information Series of integrated PC-based systems for shipboard and shoreside use.

For additional information and free literature from Marine Management Systems,

Circle 74 on Reader Service Card

S P Radio A/S, DK 9200 Aalborg DENMARK
SPT Audio, 8928 Kirby Dr., Houston TX 77054
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Standard Communications, P.O. Box 92151, Los Angeles CA 90009
Standard Radio & Telefon AB, P.O. Box 501, S-162 15 Vallingby, SWEDEN
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Watercom Communications Systems, 453 E. Park Place, Jefferson IN 47130

OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Chevron USA, 575 Market St., San Francisco, CA 94105
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS
Alfa Laval Inc., 2115 Linwood Ave., Fort Lee NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
FAST Systems Inc., 1717 Sublette Ave., St Louis MO 63110
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
Microphor, Inc., 452 E Hill Rd., P.O. Box 1460, Willits, CA 95490

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

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings, Supports
Aeroquip, 300 South East Ave., Jackson, MI 49203
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Stauff Corporation, 21-23 Industrial Park, Waldwick NJ 07463

PLASTICS—Marine Applications
SFGP Inc./Industrial Plastics, 2330 16th St. So., P.O. Box 875, Wisconsin Rapids, WI 54494

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

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar In., Engine Division, 100 N E Adams, Peoria IL 61629
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Combustion Engineering, Inc., Windsor, CT 06095
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Falk Corporation, subsidiary of Sundstrand Corporation, Milwaukee WI 53201
Fincantieri, Diesel Engines Division—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
GE Naval & Drive Turbine Systems Department, 166 Boulder Dr., Fitchburg MA 01420
General Motors, Electro-Motive Division, LaGrange, IL 60525
Isotta Fraschini Motori SpA (Fincantieri Group), Via Milano n. 7, 21047 Saronno (Va), ITALY
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp MaK, P.O. Box 90 09, D-2300 Kiel 17, WEST GERMANY
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
Marine Gears, Inc., P.O. Box 689, Greenville MS 38707
Markisches Werk, Halve, P.O. Box 1442, D-5884 Halver WEST GERMANY
MAN B&W Diesel, 50 Broadway, New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Hoelby, Denmark
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15. DK-9900 Frederikshavn Denmark
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 Germany
Michigan Wheel Corp., 1501 Buchabab Ave., SW, Grand Rapids MI 49507
MTU of North America, 10450 Corporate Dr, Houston TX 77478
North American Marine Jet P.O Box 1232 Benton, AR 72015
Northwest Marine Services Corp., 6452 So. 144th St., Tukwila WA 98168
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Schottel-Werft, Josef Becker GmbH, KG, D-5401 Spay, WEST GERMANY
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Sulzer/Escher Wyss, Ravensburg WEST GERMANY
Tenfjord Inc., 200 Jackson Ave., Hoboken, NJ 07030
Ulstein Maritime Ltd., 96 North Bend Street, Coquitlam BC CANADA V3K 6H1
Ulstein Propellers, N-6065 Ulsteinvik, NORWAY
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH, Marine Division, Postfach 1940, 7920 Heidenheim/Brenz, WEST GERMANY Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072

PUMPS—Repairs—Drives
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DELMARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Imo-Delaval, Inc., IMO Pump Division, Box 447, Monroe NC 28810
Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Vita Motivator Co., 84 Wall St., Farmingdale, NY 11735
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

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

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

SANITATION DEVICES—Pollution Control
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Systems Inc., 1717 Sublette Ave., St Louis MO 63110
Microphor, Inc., 452 E Hill Rd., P.O. Box 1460, Willits CA 95490
Research Products/Blankenship (Incinolet), 2639 Andjon, Dallas, TX 75220

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

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

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

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

SHIPBUILDING—Repairs, Maintenance, Drydocking
Aluminum Boats Inc., 304 Midway Dr., River Ridge LA 70123
Astilleros Espanoles S.A., Podilla 17, 28006 Madrid, SPAIN
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Blount Marine, Box 368, Warren RI 02885
Bollinger Lockport & Larose, P.O. Box 250, Lockport LA 70374
Brodosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA
Burmeister & Wain Skipsvaerft A/S, P.O. Box 2122, Refshaleoen, DK-1015 Copenhagen, DENMARK
Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004
Danyards A/S, P.O. Box 719, DK-9900 Frederikshavn DENMARK
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Gladding Hearn Shipbuilding, One Riverside Ave., P.O. Box 300-W, Somerset, MA 02726
HBC Barge Co. Brownsville, PA 15417
Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530
Hyundai Corporation, ShipSales Dept., 140-2 Kye dong, Chongro-ku, Soeul, KOREA
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
Marinette Maine Corporation, Marinette, WI 54143
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
Munson Manufacturing, 150 Dayton, Edmonds WA 98020
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Portland Ship Repair Yard, 5555 N Channel Ave., Portland, OR 97217
Ryan Marine Inc., P.O. Box 400, Port Bienville Industrial Pork, Pearlington MS 39572
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
Versatile Pacific Shipyards, Inc., P. O. Box 86099, North Vancouver BC Canada
Wartsila Marin Industri AB, P.O. Box 1090, SF 00101 Helskini, FINLAND
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

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

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

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

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

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

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

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

TANK LEVELING INDICATORS
Imo-Delaval, Inc., Gems Sensors Division, One Cowles Rd., Plainville CT 06062
King Engineering Corp., P.O. Box 1228, Ann Arbor MI 48106
Marine Moisture Control, 60 Inip Dr., Inwood, NY 11696

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

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

VALVES AND FITTINGS
Aeroquip, 300 South East Ave., Jackson, MI 49203
Bailey, Division of CMB Industries, P.O. Box 8070, Fresno, CA 93747
Cajon Co., 9760 Shepard Rd., Macedonia, OH 44056
Chemiquip Products Co., Inc., 3 W. 18th St., New York, NY 10011
Circle Seal Controls, Brunswick Corporation, P.O. Box 3666, Anaheim, CA 92803
Cla-Val Co., P.O. Box 1325, Newport Beach, CA 92663
Crawford Fitting Company, 29500 Solon Road, Solon, OH 44139
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Elliott Manufacturing Co., Inc. (Remote Valve Operating Equipment), P.O. Box 773, Binghamton, NY 13902
Lexair Inc., Airmatic/Beckett, 299 Gold Rush Rd., Lexington KY 40503
Loeffler Machine, US #1 & Robbins Ave., Penndel PA 19047
Newman's Inc., 7500 E Redding Place, Box 1856, Tulsa OK 74101
Nupro Co., 4800 E. 345th St., Willoughby, OH 44094
Pancoast Marine Division, Front & Porter St., Philadelphia, PA 19148
Parker Hydraulic Valve Division, 520 Ternes Avenue, Elyria, OH 44035
Parker Actuator Division, 9948 Rittman Road, P.O. Box 450, Wadsworth, OH 44281-0450
Parker Systems Division, 651 Robbins Drive, Box 3500, Troy, MI 48007-3500
Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236
Tate Andale Inc., 1941 Landsdowne Rd., Baltimore, MD 21227
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186
Whitey Co., 318 Bishop Road, Highland Heights, OH 44143

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

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

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

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

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

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

WIRE ROPE LUBRICATION SYSTEMS
Dynalube, The Kirkpatrick Group, 415 N. Loop 12 at Pioneer Dr., P.O. Box 150907, Irving TX 75014

WINCHES AND FAIRLEADS
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434
Gearmatic—see 'Braden Carco Gearmatic' above.
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
Nashville Bridge Co., P.O. Box 239 Nashville TN 37202
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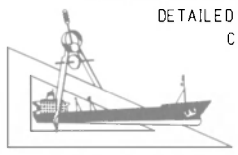

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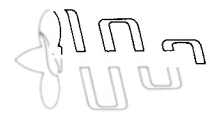

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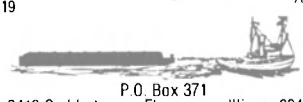

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Volvo Penta Names Bundy And Mossey Regional Managers

Volvo Penta of America, a division of Volvo North America Corporation, recently announced the appointment of **Greg Bundy** as regional manager for western Florida, Alabama and Mississippi, and **Bill Mossey** as regional manager for the Pacific Northwest which includes Alaska, Washington, Oregon, Idaho, Montana, and Wyoming.

Mr. **Bundy** and Mr. **Mossey** will each be responsible for all regional OEM and authorized Volvo Penta dealer engine, parts and accessory sales within his area of responsibility, and also administer marketing, service, warranty and parts policies and provide primary product technical support. Additionally, they will coordinate regional advertising, promotion, retail sales training and boat show activities.

National Park Service Plans Addition To Its Statue Of Liberty Fleet

The National Park Service's North Atlantic Regional Office has completed preliminary design of a personnel boat for its National Monument operations in New York Harbor. This operation is year-round and requires 24-hour transportation service for Park Service employees in any weather.

The boat will be built and certified to USCG Subchapter "T" requirements for 80 passengers. The preliminary design calls for a rugged 65-foot steel hull vessel with an aluminum superstructure. Twin turbocharged diesel engines are expected to provide a full load speed of 15 knots and 17-18 knots with a light load.

Design agent for the procurement is Phillips Cartner & Co. of Alexandria, Va.

The new boat is anticipated to begin service by the end of 1988. The announcement of the competitive procurement for construction will appear in the Commerce Business Daily.

National Waterways Conference Cosponsoring Seminar On Transportation Futures Markets

A seminar which will examine the market in contracts for future bulk transportation will be held at the Westin Crown Center Hotel in Kansas City, Mo., on April 25-27.

The seminar, "Transportation Futures Markets—An Option for Tomorrow?" will be cosponsored by Iowa State University's Extension Service of Ames, Iowa, and the National Waterways Conference, Inc., Washington, D.C. It will deal primarily with barge, rail and truck futures as a tool for hedging transportation rate and capacity risks.

Dr. C. **Phillip Baumol** of Iowa State University's Department of Economics, will deliver the keynote address and **R. Richard Carter,** vice president-agricultural products marketing, Burlington Northern Railroad, will be the luncheon speaker.

Another speaker will be **Morris L. Larson,** executive vice president of the Merchants Exchange of St. Louis, which conducts a daily "call session" for grain barge freight, including the spot market as well as forward placements.

In all, some 20 speakers and panelists including shippers, carriers, economists and consultants will participate in the seminar.

For more information on the seminar, contact: Seminar Coordinator, National Waterways Conference, Inc., 1130 17th Street, N.W., Washington, D.C. 20036; or telephone: (202) 296-4415.

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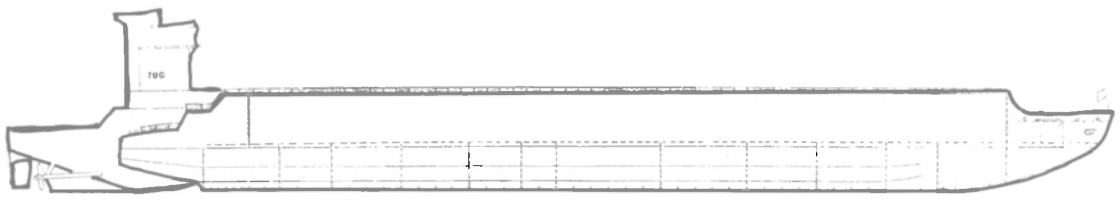

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Sealed proposals addressed to the State Engineer-Director for Highways and Public transportation, for the Construction and Delivery of a Passenger/Vehicle Ferry Vessel afloat to the State Department of Highways and Public Transportation dock at Port Aransas, Nueces County, Texas, will be received at the office of the State Engineer-Director, Room 100, 11th and Brazos Streets, Austin, Texas, **until 2:30 PM, local time, Friday, April 1, 1988,** and then publicly opened and read.

Plans and specifications for this project will be furnished without charge to any prime Contractor desiring to submit a bid. No pre-qualification is required. Mailed requests for plans should be addressed to **State Department of Highways and Public Transportation, File D-18B, Austin, Texas 78701.** Plans may also be secured locally from **Mr. Secundino Gutierrez, District Engineer, State Department of Highways and Public Transportation, S. Padre Island Drive and Greenwood Drive, Corpus Christi, Texas 78469.**

The contract for this work will not be awarded to any contractor or firm which is currently debarred from bidding on State Department of Highways and Public Transportation projects. No currently debarred contractors will be permitted to perform subcontract work on this project.

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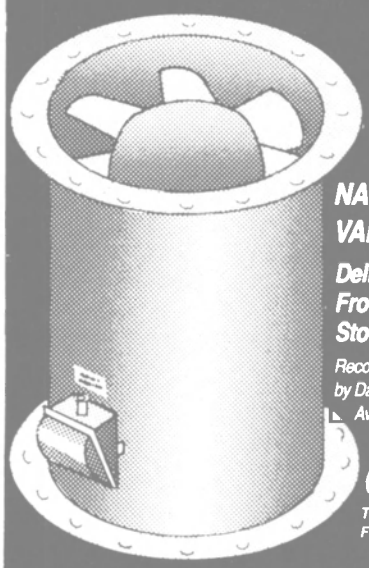

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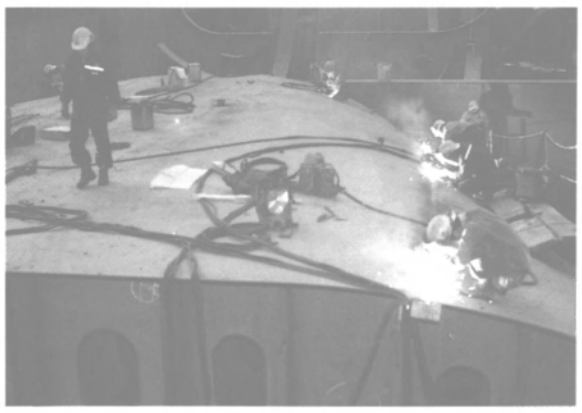

The hull structure for the first in a series of three 250,000-dwt VLCCs is shown taking shape at Hyundai Heavy Industries' Ulsan shipyard. The new VLCC will have six center cargo oil tanks, three pairs of side cargo oil tanks, three pairs of side water ballast tanks and one pair of slop tanks at side, with cargo oil capacity of 305,000 m^3.

The gigantic hull structure of the first in a series of three 250,000-dwt VLCCs built for World Wide Shipping Agency Ltd. of Hong Kong is rapidly taking shape at Hyundai Heavy Industries' (HHI) Ulsan shipyard.

Classed by Lloyd's Register of Shipping as +100A1, "Oil Tanker," the vessel will have highly advanced automatic systems which will enable the control and monitoring of all essential functions with regard to the ship's operation, starters and generator power management system, etc.

The new VLCC will have a length of about 1,056½ feet, beam of 184 feet, and depth of 97 feet, with a design draft of 65 feet. Powered by a low-speed Hyundai-MAN B&W 6S80MC main engine, she will be sailing at a service speed of 14.80 knots with normal continuous rating of 21,852 bhp.

The vessel is scheduled for delivery in July. Her two sisters are currently waiting for construction.

HHI recently received large VLCC orders, including World Wide which booked three 250,000-dwt VLCCs in 1986. The yard has 12 VLCCs on its orderbook, most of 250,000-dwt and 254,000-dwt class.

For free literature giving full information on HHI's facilities and capabilities,

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Caterpillar Announces Extended Service Coverage For Industrial & Marine Engines

Caterpillar Engine Division recently announced the availability of an Extended Service Coverage (ESC) program for their diesel and spark-ignited engines up to and including engines in the 3500 Family size range.

The ESC program is structured to provide Full Protection Coverage or Parts Protection Coverage plans covering defects in workmanship and material in eligible engines and related equipment originally warranted by Caterpillar and used in the U.S. and Canada.

The Full Protection Coverage plan provides parts and labor coverage for all eligible engines, generators, and marine gears. The Parts Protection Coverage plan provides parts only coverage for Caterpillar 3500 Family Engines and applicable generators and marine gears. Service under these plans will be available at Caterpillar authorized facilities in the U.S. and Canada.

Both plans cover defects in workmanship or material not only in major engine, generator, and marine gear components, but in all nonconsumable parts such as supply and return lines, bolts, spacers, and gaskets.

The coverage, which the manufacturer says costs only pennies per operating hour, can be obtained for 36- or 60-month periods and for specific service hour lengths ranging from 2,000 hours for some engines up to 21,000 hours for others. It is available exclusively to the first user of the covered Cat Engine and may be bought any time before the standard warranty period expires. The extended service coverage period begins when the standard warranty period ends.

To meet coverage provisions, owners must follow Caterpillar's standard Operation & Maintenance Management Guides for their engine and related attachments.

For further details on Cat Extended Service Coverage,

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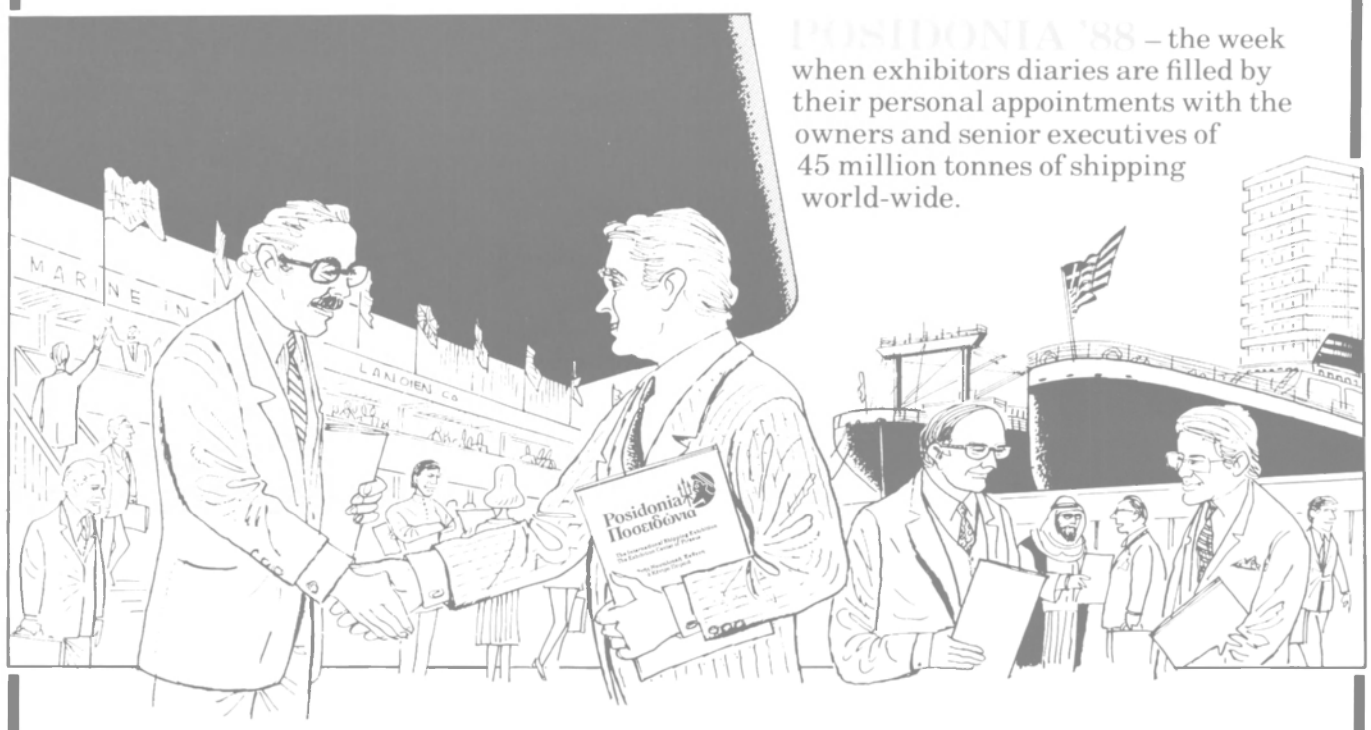
Ποσειδώνια

The International Shipping Exhibition
Piraeus Exhibition Centre, Greece
6th–11th June, 1988



POSIDONIA '88 – the week when exhibitors diaries are filled by their personal appointments with the owners and senior executives of 45 million tonnes of shipping world-wide.

FACE TO FACE: the purchasing power of the Greek ship operators internationally with the exhibiting companies from shipbuilding, shiprepair, ship supply and equipment, ports and harbours, and shipping office technology.

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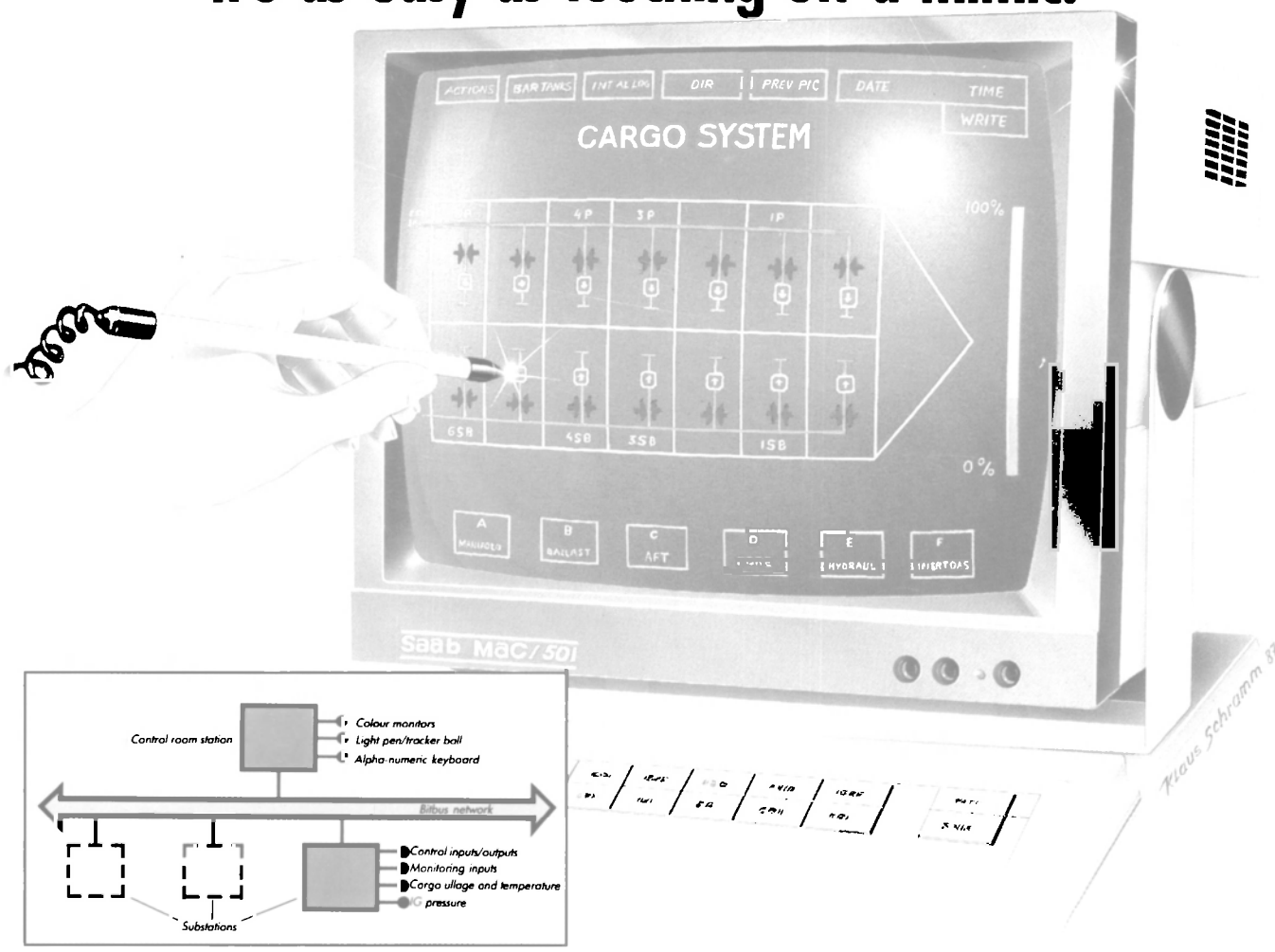
Circle 167 on Reader Service Card

Loading and discharging tankers – it's as easy as touching off a mimic!



The Saab MaC/501 brings a completely new feature into cargo handling.

You just point a light pen on mimic diagrams displayed on colour monitors to activate a pump, open a valve, or display measurement data.

Set points for valve opening and pump speed can be entered in a graphic scale displayed on the screen. Naturally, you can enter your commands on a keyboard too. Or you can use a tracker ball to "roll" the cursor on the screen.

Operator commands are given step by step, and graphics continuously display activated actions and monitoring data from temperature, pressure and level sensors.

Menues present all available options to guide the operator through the commands. You can even include Programmable Logic Controllers to pre-program sequences for automated cargo handling.

The distributed configuration of Saab MaC/501 makes installation easier and provides reliable, fail safe operation. Distributed substations communicates via a common Bitbus network and can be operated independently of other parts of the system.

A special feature of Saab MaC/501 is that TankRadar can be integrated. Saab TankRadar means non-contact measurement of ullage and closed tank condition even during service and maintenance. Benefits that made us the world leading supplier of level gauges for tankers.

Saab MaC/501 is the next generation of complete cargo handling system for tankers. Why don't you find out about the future today? Just fill in the reply coupon and we'll rush you more information.

Please send me more information about Saab MaC/501—the user friendly electronic control and monitoring system for tankers.

Name: _____

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Return to: Saab Marine Electronics AB, Box 13045, S-402 51 Gothenburg, Sweden. Phone Int. +46-31 37 00 00. Telex 21652. Telefax Int. +46-31 25 30 22.

SAAB MARINE ELECTRONICS

Saab-Scania Combitech Group

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U.S. representative: Saab Tank Control, One Harmon Plaza, Secaucus, N.J. 07094. Phone (201) 348-3000. Telex 12-403

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