An aerial, high-angle photograph of a large ship named 'BLACKBURN COVE' from 'SYDNEY' being launched down a narrow, shallow waterway. The ship is tilted upwards, and a massive plume of white water is being discharged from its stern, creating a large splash. The surrounding area includes a grassy bank on the right and a town with various buildings in the background across the water.

# MARITIME REPORTER

AND  
ENGINEERING NEWS

Carrington Launches Blackburn Cove—See Page 4

**Special Report**  
**91st SNAME ANNUAL  
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**DECEMBER 15, 1983 ISSUE**



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Painting courtesy Norman Kjeldsen, Esq.

## Bear a hand for the Wavertree.

In 1895, the Wavertree arrived at New York under sail. This painting by Oswald Brett depicts the historic event. While we cannot say for certain, the Wavertree may have been met by one of the McAllister tugs which have served New York Harbor since 1864. Legends are made of such moments. The Wavertree and her sister ships, in their day, were our responsibility.

We at McAllister take pride in being part of the history and lore of New York Harbor. The Wavertree is now at the South Street Seaport Museum and we support her restoration in order to keep maritime and nautical traditions alive for future generations. Bear a hand. Send your donation to: Ship Trust, c/o National Maritime Historical Society, 15 State Street, New York, N.Y. 10004.

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# ON THE COVER

## Carrington Launches Blackburn Cove

(PAGE 8)

## Special Report The 91st SNAME Annual Meeting

(PAGE 20)

## Shiffer Named Manager Of Repair Division At Koch-Ellis Barge

Mark C. Shiffer has been appointed repair division manager at Koch-Ellis Barge & Ship Service of Westwego, La. His duties include customer service relations, supervisor of the wet dock repair division, and job estimator. Prior to joining Koch-Ellis, Mr. Shiffer was an estimator for National Marine Service, and most recently served as vice president of St. Bernard Marine Service Company.

## Chesapeake Shipbuilding To Build Five Cruise Vessels For Star Line

Chesapeake Shipbuilding, Inc. of Salisbury, Md., recently signed a contract with Star Line Corporation of Williamston, Mich., for construction of five deluxe dinner cruise vessels. These vessels will be 160 feet long with a beam of 45 feet and draft of 6 feet, and will accommodate 400 passengers on dinner and luncheon cruises.

The first vessel is scheduled for delivery in the spring of 1984, with the other four following at one-month intervals. Star Line's growing fleet includes the Star of Chicago, Star of Charlevoix, and Star of Sanford, recently delivered by Chesapeake Shipbuilding. Star Line has not yet announced where their newest vessels will operate.

A leader in passenger vessel design and construction, Chesapeake Shipbuilding also offers a full range of building, modification, and design services, specializing in steel vessels up to 300 feet in length. In addition to the Star Line vessels, the yard has four other passenger vessels currently under construction.

# MARITIME REPORTER and Engineering News

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Recent aerial view of Newfoundland Dockyard shows (from top right) the Syncrolift ship elevator, the side-transfer table, and the three new repair berths. The graving dock shown, which was placed in service in 1926, will continue in use.

## Upgraded Facilities Dedicated At Newfoundland Dockyard

A major modernization and expansion of ship repair facilities at the Newfoundland Dockyard in St. John's was officially opened recently by Premier **Brian Peckford**. Begun in late 1981, the project was completed slightly ahead of schedule. The upgraded facilities will enable the yard, which is operated by Canadian National, to compete competitively in the ship repair market.

The C\$30-million project was made possible through extensive financial participation by the Government of Newfoundland and Labrador in the form of loan guarantees and interest subsidies.

The modernization includes a Syncrolift ship elevator, side transfer facility, and three repair berths as well as various ancillary

equipment, including a tower crane 147.6 feet high. An existing wharf was extended by 301.8 feet to provide additional berthing space.

The Syncrolift marine elevator system, developed by Pearlson Engineering Company of Miami, is recognized around the world as a fast, cost-effective way of drydocking small- and medium-sized ships. The lift itself is a submersible platform, on which are mounted four heavy steel rails. To drydock a ship, a cradle matching the contours of the hull is assembled from prefabricated, reusable standard components. Both the keel blocks and support members are mounted on double-flanged steel wheels that rest and move on the rails. When the cradle is ready, the platform is submerged, the vessel is maneuvered into position over the cradle, and the platform is hoisted by cables driven by synchronized electric motors, at a speed of 22 centimeters (8.58 inches) per minute.

The lifting platform installed at the Newfoundland Dockyard is 283.8 feet long and 65.6 feet wide, capable of handling vessels up to 295 feet long overall and 4,000 tons displacement.

When the vessel has been raised, the cradle is moved by a powerful tractor to the transfer table. This is also mounted on rails, at right angles to the lift platform. The table is then moved laterally until its surface tracks align with those of a vacant repair berth. The tractor is then used again to place the cradled vessel on the berth, and the lift and transfer table are free to move other vessels.

The three repair berths are each about 348 feet long, and together cover a total area of approximately 75,000 square feet, constructed of concrete deck on steel pilings. There are an additional 21,500 square feet of paved surrounding area.

The same concrete and steel construction was used for the wharf extension, which is about 302 feet long and 32.8 feet wide. The existing 567.5-foot-long graving dock, which was placed in service in 1926, will continue to be used, primarily for larger vessels.

### Cosat General Awarded \$12.7-Million Navy Contract For Satcom Services

Cosat General Corporation, Washington, D.C., has been awarded a firm-fixed-price contract for continued tri-oceanic UHF GAPFILLER satellite communications services. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity.

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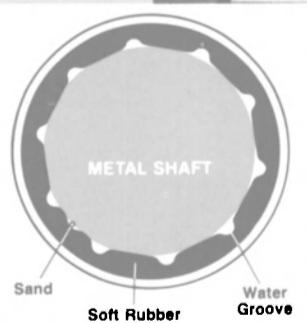
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**Raytheon Marine Names  
John Scott Marketing And  
Sales Manager, Europe**

Raytheon Marine Company has appointed **John Scott** marketing sales manager of its marine electronics for pleasure, fishing, and light commercial craft in Europe. Products include radars, lorans, radiotelephones, depth indicators and recorders, color fish-finders, satellite navigators, sonars and loudhailers.

Mr. Scott will be based at Raytheon Marine Sales & Service's London office where he had previously served as operations manager. He has 25 years of radio electronics and communications experience serving with the P&O Steam Navigation Company, Arab Maritime Petroleum Transport Company, and International Marine Radio Company, prior to joining Raytheon.

Headquartered in Manchester, N.H., Raytheon Marine Company has a worldwide sales and service network, providing outstanding electronics for all kinds of vessels.

For information, in Europe contact: **J.A. Scott**, Raytheon Marine Sales and Service Company, Millard House, 5 Exchange Building, Cutler Street, London E1 England, Phone: 01-623-4451; Telex: 8954198.

**General Electric Awarded  
\$23.4-Million Navy Contract  
For FBM Engineering**

The General Electric Company, Pittsfield, Mass., has been awarded a \$23,409,345 cost-plus-fixed-fee contract for engineering services in support of the Fleet Ballistic Missile (FBM) program. The Navy's Strategic Systems Project Office, Washington, D.C., is the contracting activity.

**Texas Instruments Offers  
Platinum-Clad Anodes  
For Corrosion Protection  
—Literature Available**

Texas Instruments has developed a platinum-clad niobium material that has been demonstrated to provide excellent protection for steel structures exposed to corrosive conditions such as underwater (both sea and fresh water) or underground environments.

The material works in an impressed current protection system (ICP). It is available in three forms—mesh, wire, and probe—depending on application conditions.

The mesh material has been successfully demonstrated through years of use to protect underwater pier structures. The probe material is designed for protection of

vessels containing or transporting water, as well as underwater structures. The wire material has been shown to successfully prevent corrosion of steel reinforcing bars in concrete structures.

Texas Instruments clad platinum anodes offer significant advantages. The cladding process provides a coating that is uniformly thick, non-porous and has excellent bond integrity.

Experience has shown that the combination of platinum clad on

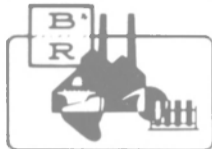
niobium is well suited to impressed current protection applications. In service, the platinum remains electrochemically active while the substrate forms an adhesive oxide film that is corrosion resistant. The anodes are said to have higher current-carrying capacity and longer life than designs using other anode materials.

Texas Instruments produces platinum-clad anode materials using a solid phase, cold-bonding process. The material is clad at a

heavy gauge and subsequently cold rolled to a finished thickness. The composite structure has a uniform, non-porous platinum surface that interfaces directly with the niobium substrate. Because the metals are joined at the atomic level without adhesives, solder or brazing alloy, they are void-free and cannot be separated.

For further information and free literature,

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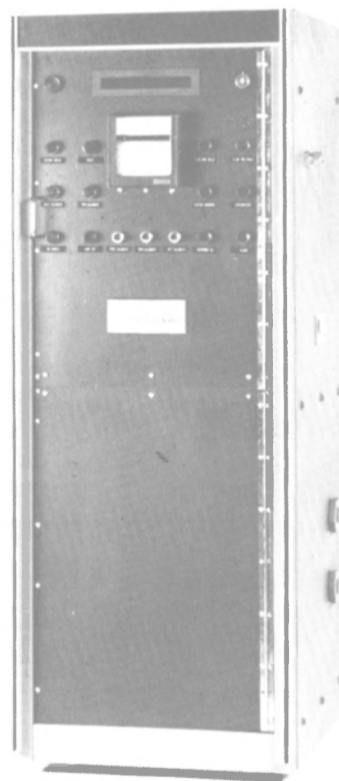
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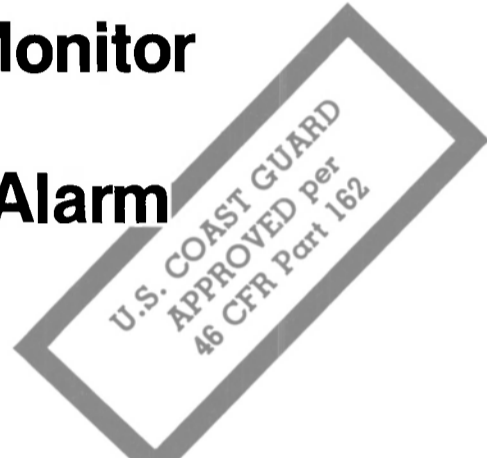
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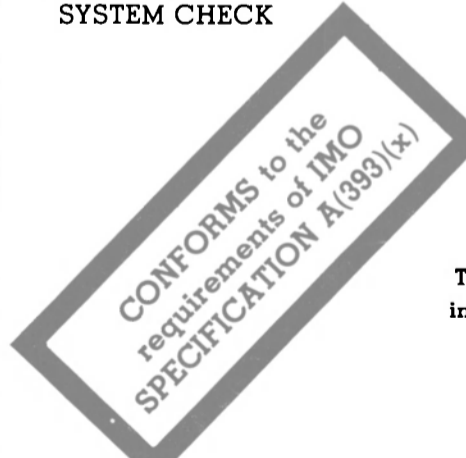
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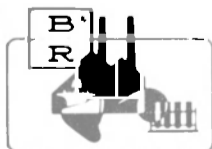
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# ON THE COVER



Carrington Slipways is building a series of tugs for J. Fenwick and Co. Pty. Ltd., powered by Niigata developed Z-Peller drive propulsion units.

## Carrington Delivers The Blackburn Cove

The Blackburn Cove was delivered recently to J. Fenwick & Co. Pty., Ltd., of Balmain East, NSW, by Carrington Slipways' Tomago, Newcastle, NSW (Australia) yard.

The tug is fitted with a Niigata developed Z-Peller propulsion system. The Niigata Z-Peller drive consists basically of an engine, a drive shaft and a Z-type propeller. The Z-Peller offers powerful thrust high maneuverability and quick response to the helm.

The Z-Peller propulsion units on the Blackburn Cove consist of two Niigata model ZP-3B, Z-Peller right angle drive propulsion units with a maximum input of 1,800 hp at 720 rpm. Main propulsion power is provided by two Niigata diesel engines model 6L28BX (1,800 hp each).

Two Caterpillar 3306T marine electric set engines close coupled to a Kato brushless T.E.F.C. generator code 4P4-1000 having continuous rating of 125 Kw supply auxiliary power. The engine monitor is an Autronica type KB6.

The vessel is also equipped with: two Espholin air compressors; a Kyoritsu radar; a Coden HF/SSB transceiver; two A.W.A. Pilot-phone VII VHF/FM 55-channel transceivers; a Decca model 450M autopilot; a Marconi minicall 10-way talkback public address sys-

tem; one set of Aqua Signal, series SS, single-tier navigational lights; a Francis P N 47052073, M19 non-magnetic 12-inch gray cabin-controlled searchlight; a Kockums air whistle model KT75-440; a Desmi model SA-80-220 fire pump and a Desmi model S 50-32-135 horizontal centrifugal self-priming pump.

A combined anchor windlass and towing winch with below deck storage reel is by Kawasaki.

Measuring 105 feet (32 meters) long, with a molded breadth of 33.6 feet (10.25 meters) and a molded depth of 16.4 feet (5.0 meters), the Blackburn Cove displaces 635 tons. The tug has a running speed of 12 knots and is in service in Sydney Harbor.

### BLACKBURN COVE Major Suppliers

Main Propulsion	Niigata
Auxiliary Engines	Caterpillar
Generator	Kato
Engine Monitor	Autronica
Air Compressor	Espholin
Fuel Oil Transfer Pumps/ Fire Pump	Desmi
Combined Anchor Windlass and Towing Winch	Kawasaki
Radar	Kyoritsu
HF/SSB Transceiver	Coden
VHF Transceiver	A.W.A.
Autopilot	Decca
P.A. System	Marconi
Navigation Lights	Aqua Signal
Searchlight	Francis
Air Horn	Kockums

## Report On Navy Market Available From IMA

International Maritime Associates (IMA), a Washington, D.C.-based management consulting firm, has published an extensive report entitled "U.S. Navy Shipbuilding Program: Market Opportunities and Contracting Requirements." IMA's objective has been to produce a tightly written, practical, thoroughly professional reference document.

Under one cover is a wide range of highly pertinent marketing information: Navy programs planned or in progress; the Navy organization; how programs are developed; the process of ship acquisition; special features of Department of Defense contracting; and points of marketing contact.

The 200-plus page report is designed for top management use. It was prepared by professionals experienced in the Navy market. Market opportunities are identified, marketing actions are suggested. Forms used to enter the Navy market and backup details are included in five appendices.

The first of four quarterly updates has been published recently.

The updates are designed to convey changes that occur in program direction and composition.

The report, including updates, is available for \$380 by writing **James R. McCaul**, president, International Maritime Associates, Inc., 1800 K Street, N.W., Washington, D.C. 20006 or for further information,

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## Hamilton Joins Raymond Offshore As Vice President

**Herb Hamilton** has joined Raymond Offshore Constructors, Inc. in Houston as vice president, marketing and business development.

He has been active in international offshore construction for almost 20 years, most recently in connection with the Middle East and West Africa activities of Union Industrielle et d'Enterprise.

During the early 1970s Mr. **Hamilton** was executive vice president of the Netherlands Offshore Company; and in the late 1970s, he was operations manager in the North Sea for Ugland-Raymond, a joint venture that operated the derrick ship Sarita.

## Los Angeles SNAME Discusses Offshore Problems And Solutions

A large turnout of members and guests attended the recent second meeting of the 1983-84 season of the Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers.

Guest speaker was **David B. Sucharski** of ARCO Oil and Gas Company in Dallas. His presentation, which included slides but no formal paper, was titled, "Overview of a Major Oil Company's Varied Marine Activities." General topics involved the acquisition, exploration, and development of offshore oil lease sites, Arctic and deep-water environments, and new technology of vessels and equipment.

In determining lease sale strategy, the author stated, how much to bid for which tracts, factors

such as expected recoverable reserves, expected value and technical feasibility must be considered. Greater cost requires greater value. Mr. **Sucharski** discussed ARCO's various methods for the offshore exploration, development, and tanker transportation of oil in severe environments. Specific problems relative to ice conditions and forces were discussed.

Of particular interest is the development of a submarine drone to conduct ice-profiling operations. Arctic logistics involve topics such as ice-breaking performance, submarine tankers, and remote ice-free loading and storage facilities. Deep-water drilling and production platforms for the coastal U.S. were also discussed.



Principals at meeting of Los Angeles Metropolitan Section of SNAME were (L to R): Dr. Maxwell Cheung, section chairman; David B. Sucharski, author; James C. Schaff, secretary-treasurer; and Gary Cash, vice chairman.



## New Data Sheet Analyzing Combustion Efficiency

### Available From Howe-Baker

An aid in determining possible fuel cost savings derived from burner upgrading is now available from Howe-Baker Engineers, Inc. The data sheet, consisting of four different graphs depicting natural gas, propane, No. 2 (diesel) oil, and No. 6 oil, is a valuable guide for virtually every operating, power, plant, chemical, and mechanical engineer interested in combustion efficiency as a function of excess oxygen in the flue gas and flue gas temperature.

Data is based on typical anticipated efficiency of a retrofitted Econoflex burner—a dual-phase, multi-port type that permits combustion at high efficiency at low excess air. The Econoflex burner, with its relatively short flame length and soot-free burn, permits retrofitting existing boilers and heaters without the possibility of flames impinging on tubes or depositing soot and reducing heat transfer. In addition, the new Econoflex burner sharply reduces the need for tube replacement, as heat is transferred mostly by radiation thereby extending tube life.

For a free copy of the new data sheet,

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## MacGregor-Navire Cargo Access Equipment Ordered For Blue Star Reefers

The four refrigerated cargo ships ordered from the Belfast shipyard Harland & Wolff by British reefer specialist Blue Star Line are to be fitted with MacGregor-Navire (MGN) cargo access equipment. Confirmation that the Northern Irish yard had, as long expected, secured the Blue Star order came early in August and gave the green light for MGN to proceed with all speed on production of the extensive shipsets of hatch covers—the design of which had, in anticipation, already been accepted by the yard.

Intended for worldwide trading, a principal influence on the final design stemmed from the owner's stipulation that the ships be self-sustaining and able to operate in any port wherever situated, whether or not equipped with modern shoreside facilities for handling reefer cargoes, particularly bananas.

Thus, besides the now almost mandatory provision that a new ship be designed for maximum operational economy in respect of fuel consumption and manning requirements (and in a reefer, use the minimum of power for refrigeration), the design of these four-hold, 463,000-cubic-foot vessels also incorporates cargo-handling and

access equipment enabling a degree of flexibility that, together with other innovative features, puts them in the forefront of reefer technical development.

MacGregor-Navire is to supply a total of 14 hatch covers plus eight side shell doors per ship. The weather deck and 'tweendecks Nos. 2 and 3 have four hatches on each, with deck No. 4 in holds 2 and 3 having two only. The weatherdeck

covers and those on deck 3 incorporate provision for thermal insulation.

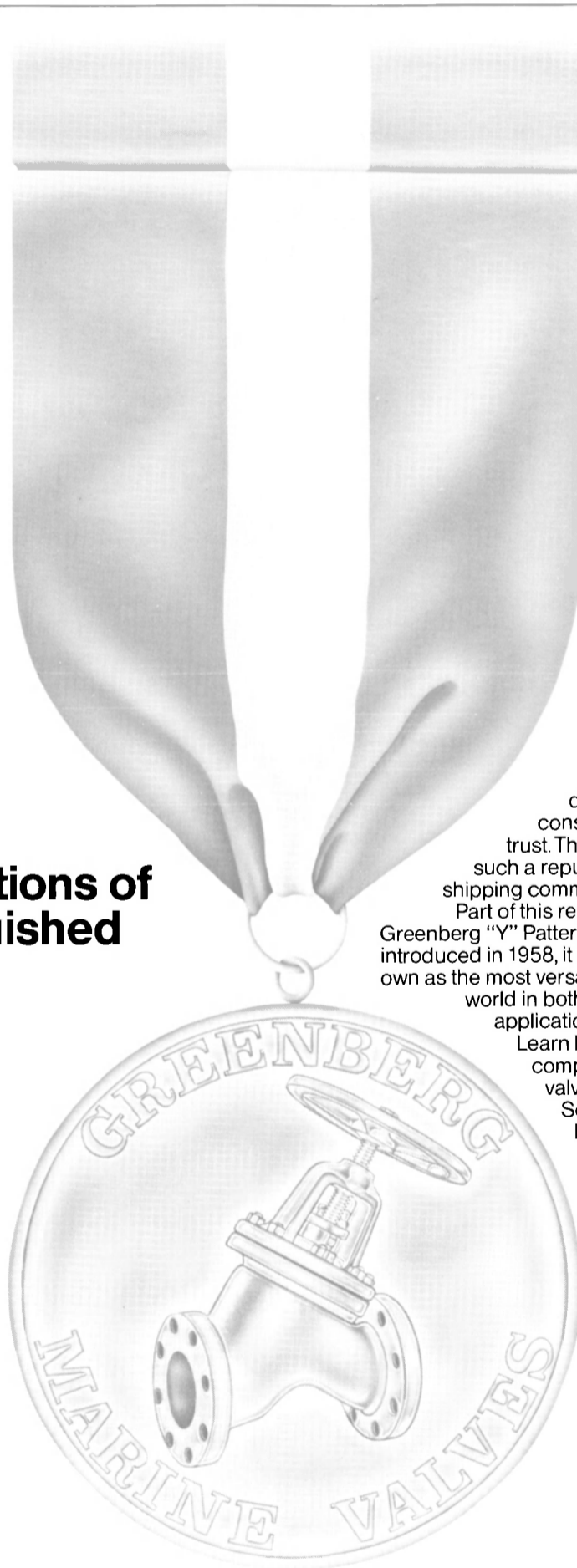
Chosen for all hatches are covers of the folding type. Those on the weather deck are actuated by external cylinders with the innovative "rack-back" (i.e., slotted) hinge—a feature that enables fully automatic cleating at all points around the perimeter and at the cross joints. Each cover, compris-

ing four panels, operates and stows in single pairs. They are designed to permit stowage on top of a single tier of 20-foot/20-ton containers.

Though also hydraulically operated, the 'tween deck covers employ a different system of actuation—a combination of cylinders and link mechanisms deriving their power from mini-packs located within the panels.

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## Harris Awarded \$5-Million Addition To Navy R&D Contract for Satcom Work

Harris Corporation, Palm Bay, Fla., has been awarded a \$5-million modification for incremental funding under a previously awarded cost-plus-fixed-fee research and development contract for the Navy's EHF satellite com-

munication program. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity.

## Jacobs Joins Contromatics In Marketing/Sales Position

The appointment of **Christopher J. Jacobs**, assuming the dual roles of vice president, mar-

keting, and director of international operations, has been announced by Contromatics' president **John P. Kempton**. In this new management position, Mr. **Jacobs** is responsible for marketing matters and the development of an international manufacturing and sales network.

He had been director, marketing and sales, with the subsidiary of

GEC making Fisher control valves in seven plants throughout the world. He was educated in England, was commissioned in the Royal Air Force, and joined his previous company in 1960 working for them in India, People's Republic of China, Europe, Australia, and the U.S.S.R. in many diverse roles.

Contromatics is a major manufacturer of high-performance butterfly and ball valves serving the marine process, power, and general service industries.

# STATE OF THE 'ART-PROFITABILITY.

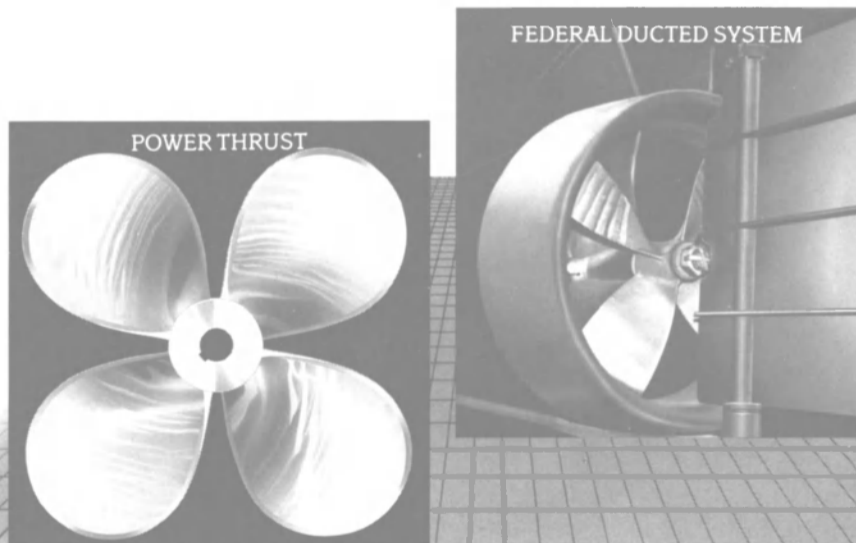
Federal's vast technical expertise in marine propulsion system design and construction can help improve your bottom line profitability. How? Simple. Federal engineers every open and ducted propulsion system to help most any work boat attain maximum operational efficiency in fuel savings and maneuverability. This, in turn, lowers your overhead costs and helps lead to optimum profitability. And to ensure that all propulsion, engine, hull and use requirements are perfectly matched, Federal offers customers a no-charge technical analysis and recommendation service.

**Power Thrust\*** is an excellent example of Federal's engineering expertise because it helps to reduce the stem vibration common to many work boats. Its rugged 4-blade design runs noticeably smoother than the standard 3-blade props it replaces. The extra area of four blades, which reduces diameter requirements, makes it ideal for in-

stallations where clearance is limited. To resist damage, Power Thrust is cast with heavy cross-sections and leading edges. Available in Federal-formulated "B" bronze, Ni-Bral or CF3 mod stainless steel, it's highly resistant to corrosion, too. Diameters up to 72 inches are standard.

**Federal Ducted Systems** deliver an optimum level of operational efficiency due to their technically-advanced design. They feature a 4-blade Kaplan-style propeller, installed inside either a steel or fiberglass nozzle. This Federal engineered ducted propeller system will deliver either more thrust with equal power, or comparable thrust with less power when compared—size for size—with open props. Typical bollard thrust increases range from 40 to 50%. Fuel savings up to 25% are also commonly reported.

To learn how you—like thousands of other professionals—can also help improve your work boat profitability through Federal's technology, contact: Federal Propellers, 1521 Buchanan Ave., Grand Rapids, Michigan 49507. Telephone 1 616 452-6946.



## FEDERAL PROPELLERS

## Malcomson Named Manager Of Manufacturing For Raytheon And Sorensen

**Stanley Clark**, president of Raytheon Marine Company and Sorensen Company, Manchester, N.H., has announced that **Malcolm R. Malcomson** has been appointed manager of manufacturing operations of these two Raytheon companies. He will report directly to Mr. **Clark**.

Mr. **Malcomson** will be responsible for planning, procurement, production, product assurance, and inventory control for manufacturing operations for Raytheon Marine and Sorensen products.

Raytheon Marine produces marine electronic navigation and communication equipment for ships, workboats, fishboats, and recreational boats. These products include radars, ARPA, loran, fishfinders, radiotelephones, and more. Sorensen produces linear, phase-controlled, and modular switching power supplies, as well as custom and semi-custom power assemblies for laboratory, industrial, and OEM applications.

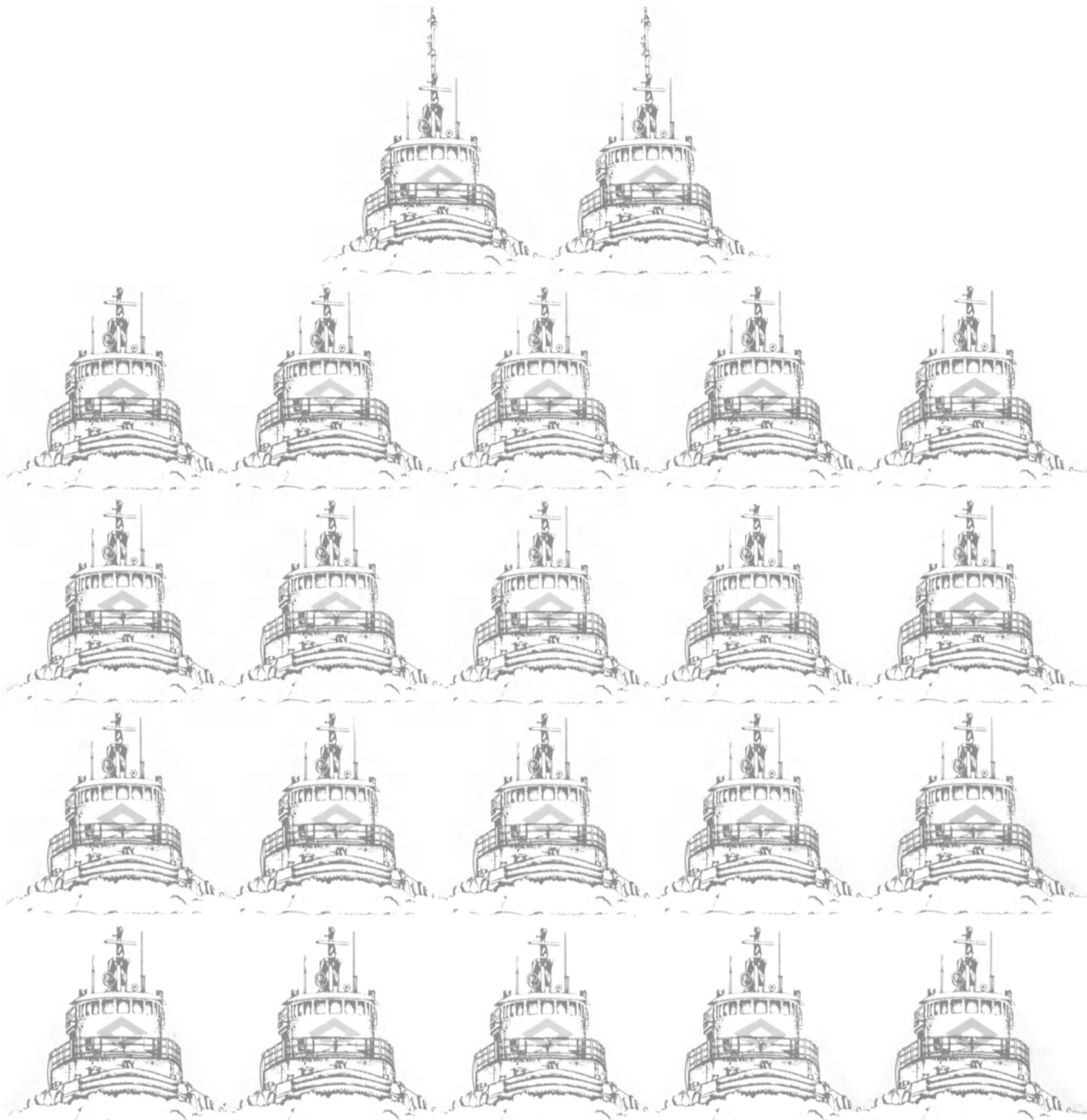
Before joining Raytheon, Mr. **Malcomson** was vice president of operations and president of Iotron Corporation; prior to that he was president of Mark Systems, Inc.

## Leslie Offers Data Sheet On Heavy Fuel Viscometer

A free data sheet describing its heavy fuel viscometer is now available from Leslie Co. of Parsippany, N.J. For proper atomization and maximum efficiency in a combustion system designed to burn heavy fuel oil, it is essential to control the viscosity of the fuel to a specific value. The Leslie direct viscosity control system with its balanced dual capillary principle of measurement provides a constant viscosity for any mixture of a wide variety of heavy fuel oils. The viscosity of the fuel is measured continuously (not periodically sampled) and deviation from a specific value is corrected automatically.

For a copy of this data sheet,

Write 72 on Reader Service Card.



## **Twenty-two reasons why Curtis Bay is the towing choice in three major East Coast ports.**

Twenty-two tugs make a powerful difference. And with over 70 years of experience plus trained, expert crews, you can be sure of time-saving (and cost-saving) efficiencies. Perhaps that's why more marine managers are saying, "When you go with Curtis Bay Towing, you have more on your side."



### **CURTIS BAY TOWING COMPANY**

Philadelphia  Baltimore  Hampton Roads  
Headquarters: The World Trade Center Baltimore, Suite 800, Baltimore, Maryland 21202, 301-962-6500.

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## Interstate Electronics Gets \$23.6 Million For Work On Trident Missile Program

Interstate Electronics Corporation, Anaheim, Calif., has been awarded a \$23,640,000 letter contract for development and production of test instrumentation equipment in support of the Trident missile program. The Navy Strategic Systems Project Office, Washington, D.C., is the contracting activity.

## MSC Awards \$200 Million In Contracts For Four More SL-7 Conversions

Navy contract options for almost \$200 million have been exercised for the conversion of the last four of eight high-speed containerships into roll-on/roll-off units. They will be used by the Military Sealift Command to provide support to rapid deployment forces around the world.

The four ships to undergo con-

version are the USNS Denebola at Pennsylvania Shipbuilding Company (PENNSHIP), Chester, Pa.; the USNS Altair and the USNS Pollux at Avondale Shipyards, Inc. of New Orleans; and the USNS Regulus at National Steel and Shipbuilding Company (NASSCO), San Diego, Calif.

The same three contractors received contracts totalling \$184 million for conversion of the first four of the ships in September 1982. All eight are named for navigational stars. The first four of

the Fast Sealift Ships now undergoing conversion are the USNS Algol and the USNS Bellatrix at NASSCO, the USNS Antares at Avondale, and the USNS Capella at PENNSHIP.

These containerships are being converted to roll-on/roll-off ships designed to carry containers, flat-racks, seasheds, helicopters, and lighterage. Each ship is capable of speeds in excess of 30 knots. The average speed of ordinary cargo ships is 20 knots.

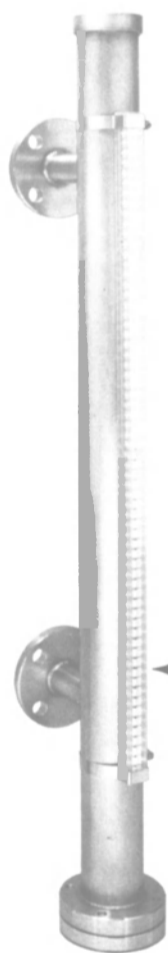
The conversion of the Fast Sealift Ship class will include removal and rebuilding of some internal structures previously used for stowing containers and the installation of new internal and external ramps for loading, storing and unloading military vehicles. Additional decks, cargo cranes and a helicopter hangar also will be installed.

When converted, the former SL-7 class containerships will constitute a major element of the Navy's Fast Sealift Ship Program. They will be prepositioned at designated ports for movement of high-priority cargo specified for early sealift deployment.

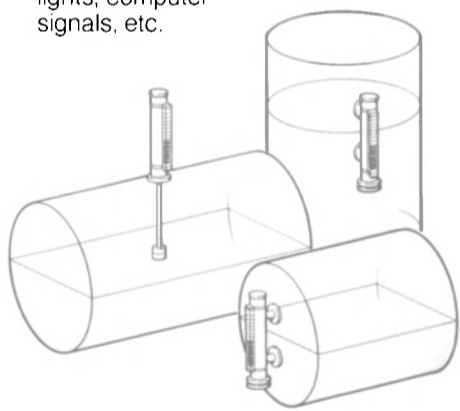
The Military Sealift Command is responsible for providing the necessary sealift to deploy and sustain military forces overseas, as rapidly and for as long as the military requirement exists. The MSC also operates auxiliary ships that deliver supplies to Navy combatant ships while underway, oceanographic and survey ships and tankers and dry cargo ships that deliver Defense Department cargo worldwide.

## GEMS SureSite Level Indicators:

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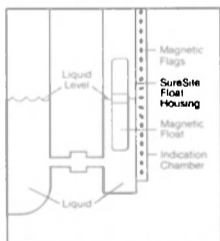
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## Newport News Awarded \$100-Million Navy Contract For Nuclear Sub Overhaul

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., has been awarded a \$100,884,500 modification that converts a previously awarded cost-plus-fixed-fee contract to a cost-plus-incentive-fee contract to accomplish the overhaul, refueling, repair, and alteration of the USS Will Rogers (SSBN-659). The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

## Navy Awards \$55 Million To Westinghouse Electric For Propulsion Components

Westinghouse Electric Corporation, Plant Apparatus Division, Wilkins Township, Pa., has been awarded a \$55,080,000 face value increase to a previously awarded cost-plus-fixed-fee contract for naval nuclear propulsion components. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

**Aqua-Chem Introduces  
New Plate-Type Evaporator  
—Literature Available**

The Water Technologies Division of Aqua-Chem, Inc. recently introduced a new line of marine plate-type, seawater desalting evaporators, designated type "SP". The standard unit, using low-temperature waste heat, is capable of producing 10,000 to 15,000 gallons of fresh water per day; other sizes are available on request.

Specifically designed for naval, commercial marine, and offshore applications, the standard "SP" single-stage plate evaporator measures 83 inches high, 70 inches wide, and 57 inches deep. Using waste heat from a diesel engine or other source, the unit evaporates salt water in a vacuum to produce fresh water.

A swing-away hatch provides easy access to the plate bundles and distiller chamber for ease of maintenance. Standard titanium plates, used in both the evaporator and the condenser plate bundles, provide excellent heat transfer and are resistant to seawater corrosion. A copper-nickel shell and internals are provided as standard; coated steel shells and internals can also be provided.

For more information and free literature on the new evaporators,

Write 85 on Reader Service Card

**Sperry Awarded Navy  
Contract Worth \$6+ Million  
For Technical Assistance**

Sperry Corporation, Sperry Division, Great Neck, N.Y., has been awarded a \$6,238,000 firm-fixed-price contract for technical assistance, logistical support requirements for the Fleet Ballistic Missile and Strategic Weapons System navigation subsystems. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

**Wesmar Sonar Effective In  
Shallow-Water Operations  
—Literature Available**

Wesmar's 500SS side scan sonar has proven to be a valuable tool for locating submerged objects. The lightweight side scan tow fish (13 pounds) and chart recorder are an economical and valuable tool for shallow-water salvage, survey, and diving operations.

Two sonar transducers sweep the sea bottom with acoustical beams. Each transducer can be adjusted to various angles for the best resolution. One transducer, for example, can be adjusted to look up or down while the other side scans. A versatile shipboard

chart recorder records the reflected images. 2K bits of memory are standard, packing 64 marking points per inch; this gives a sharp, detailed picture that is easy to interpret. The recorder can print both left and right channels or print either channel across the 8 inches of paper. For scanning accuracy, seven depth ranges (100 to 1,600 feet) are available. Five paper speeds match tow speed, depth, and the desired targets position.

The 500SS has proven especially

useful in locating and identifying shipwrecks, pipelines, oil heads, and underwater obstructions. The unit paints an accurate picture of the bottom—even deciphering the density of the bottom itself—for virtually any application. If a target of interest appears, the "event" marker can be pushed, marking the spot for easy reference at a later date.

For more information and free brochure on the 500SS,

Write 74 on Reader Service Card

**\$65-Million Navy Contract  
Awarded To GE For Trident  
Fire Control System**

General Electric Company, Pittsfield, Mass., has been awarded a \$65,155,500 letter contract for development and initial production of a fire control system in support of the Trident missile program. The NAVY Strategic Systems Project Office, Washington, D.C., is the contracting activity.

# MARINE INDUSTRIAL FABRICATORS

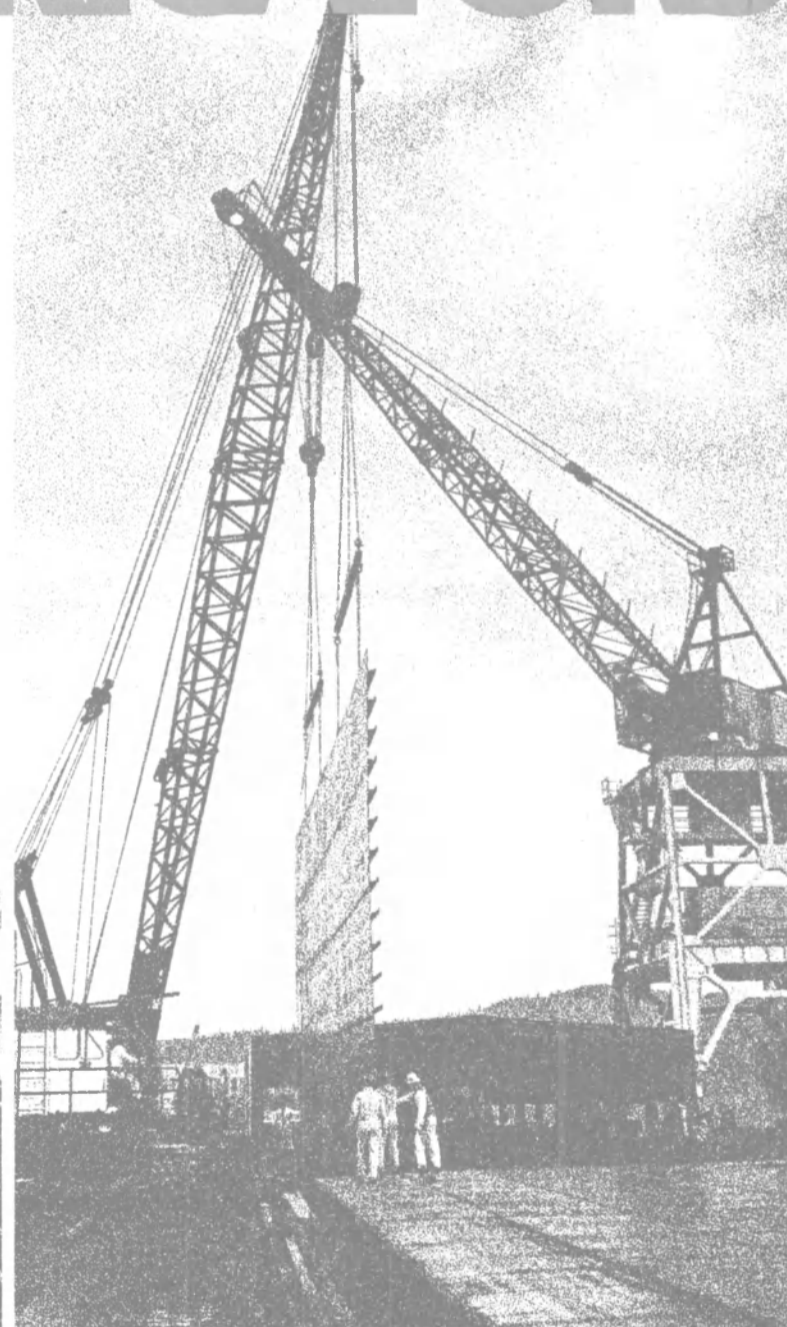
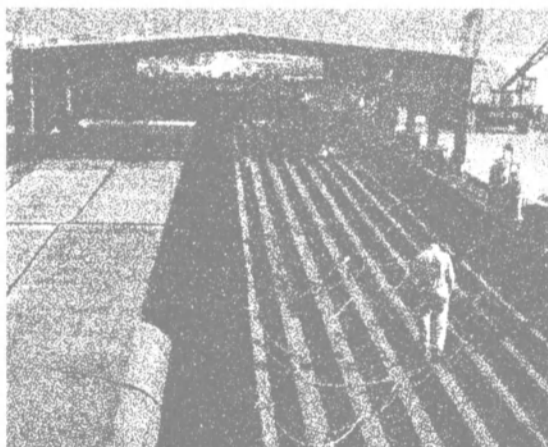
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## Frigate De Wert (FFG-45) Delivered Early By Bath Iron Works

The Oliver Hazard Perry Class (FFG-7) frigate program reached a milestone recently with the delivery of the USS De Wert (FFG-45) at Bath Iron Works, Bath, Maine. She is the 36th ship of the currently approved program of 54 FFGs. Of this total, 50 are for the U.S. Navy and four are for the Royal Australian Navy.

The Guided Missile Frigate Ship Acquisition Program of the Naval Sea Systems Command is proud of its achievements with the FFG Class, and this most recent delivery is one of the reasons why. The DeWert's delivery is a new high in early deliveries for the FFG-7 Class. To this point, Bath Iron Works has delivered follow-on ships an average 13 weeks in advance of the original contract delivery dates. The De Wert was delivered 25 weeks ahead of the original contract date.

The FFG program was initiated in 1971 to provide a new class of ocean escorts to replace World War II destroyers as they were retired from the active fleet. The large number of ships being retired created the need for a large number of ships (50) to meet the projected requirements of the 1980s. As a result, the FFG-7 Class is the largest class of surface combatant ships to be acquired since WW II.

FFGs are designed to provide protection for military and merchant ship convoys. To do this, they are capable of detecting and attacking submarines; destroying anti-ship missiles launched from enemy submarines, aircraft, or surface ships; and destroying hostile surface ships.

To accomplish her mission and at the same time to remain cost-effective, FFGs were constructed us-



Delivered 13 weeks early by Bath Iron Works, guided-missile frigate De Wert (FFG-45) passed her acceptance trials recently with flying colors.

ing innovative design concepts. These include modular construction techniques and the utilization of labor-saving devices to keep crew size to a minimum. Improvements in habitability—lounge

areas, berthing and mess facilities—also have been incorporated in these ships.

The Perry Class has been designed to respond to threats as rapidly as possible. The propulsion system is a computer-controlled, 40,000-shp GE gas turbine power plant that can be brought on-line and made ready to operate in less than an eighth the time required for either conventional steam- or nuclear-powered ships. The combat system integrates a computerized command and decision system with the ship's sensors and weapons. To meet potential threats, FFGs are armed with surface-to-air and surface-to-surface missiles, a rapid-fire gun, ASW torpedoes, and the embarked LAMPS helicopters.

At the recent launching of USS Taylor (FFG-50) at BIW, Vice Adm. E.B. Fowler, Commander, Naval Sea Systems Command, addressed the success of the FFG Class when he said, "... in firepower and anti-submarine warfare, FFGs are greatly advanced from their World War II predecessors—and with a smaller crew."

### Twin Disc Offers Free Bulletin On Parts Kits

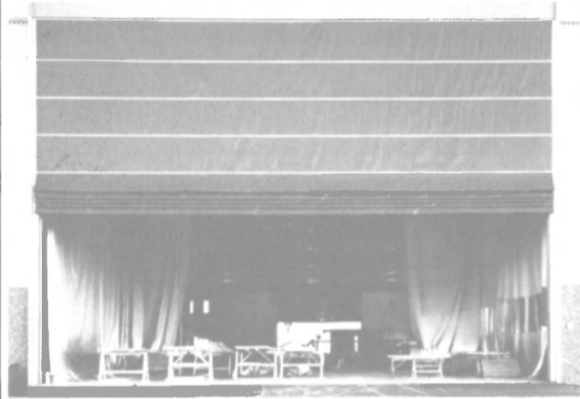
An eight-page, pocket-sized bulletin detailing various renewal parts kits available for its full line of marine transmissions is available free from Twin Disc, Incorporated of Racine, Wisc. These kits include renewal parts approved by Twin Disc for complete overhaul as well as on-board and shoreside repair.

Each parts kit is numbered and described in detail covering all parts included. Twin Disc assures the user that the parts are equal to or better than the original. This permits updating even a 10-year-old marine transmission with advanced engineering features.

For a copy of the Twin Disc bulletin,

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High Wind Loads For tough environments  
Easy to install and maintain

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The Z-Peller is suitable for many vessels including tugs, ferries, pusher barges and Ro/Ro ships. High manoeuvrability is the biggest advantage, as Z-Peller rotates a full 360°, a twin Z-Peller drive can turn a hull in any direction. Quick operations such as fast stopping, sharp turning, spinning, rapid ahead/astern movement and side-stepping are possible along with fine speed control from dead slow to full.



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## Navy Rescue/Salvage Vessel Launched At Peterson Builders

The first of four U.S. Navy Rescue/Salvage ships under construction at Peterson Builders, Inc. in Sturgeon Bay, Wisc., was launched recently during formal Navy ceremonies. The 225-foot, steel-hulled ARS-50 was christened Safeguard, a name synonymous with the function of a vessel of her type. This new class of ship represents a substantial increase in capabilities of vessels providing assistance to stranded ships or those in peril on the high seas.

One other ship of this type has carried the same name. The first Safeguard (ARS-25) was launched 40 years ago. She completed 35 years of active duty with the U.S. Navy in 1979. Her years of service won her one battle star for World War II, a Presidential Unit Citation and five battle stars during the Korean War, and nine battle stars for Vietnam service. She served her country well carrying out many deep-water towing operations, salvage work, cargo deliv-

eries, and provisioning missions.

Participating in the launching ceremony as sponsor of the ship was **Mrs. Thomas J. Kilcline Sr.** of McLean, Va. Her daughter, **Mrs. Mary Kilcline Novak**, served as matron of honor. An audience of close to 1,000 were on hand for the event. **Robert E. Peterson**, executive vice president of the shipyard, officiated as master of ceremonies. The Most Rev. **Aloysius J. Wycislo**, bishop of the Green Bay Diocese, gave the invocation.

The speakers were introduced by Comdr. **Paul M. Robinson**, USN, Supervisor of Shipbuilding, Conversion and Repair, U.S. Navy, Sturgeon Bay. Remarks were made by Rear Adm. **George W. Davis Jr.**, USN, Deputy Commander, Surface Ships, Naval Sea Systems Command, Washington, D.C. The keynote address was given by the sponsor's husband, Vice Adm. **Thomas J. Kilcline Sr.**, USN (ret.).

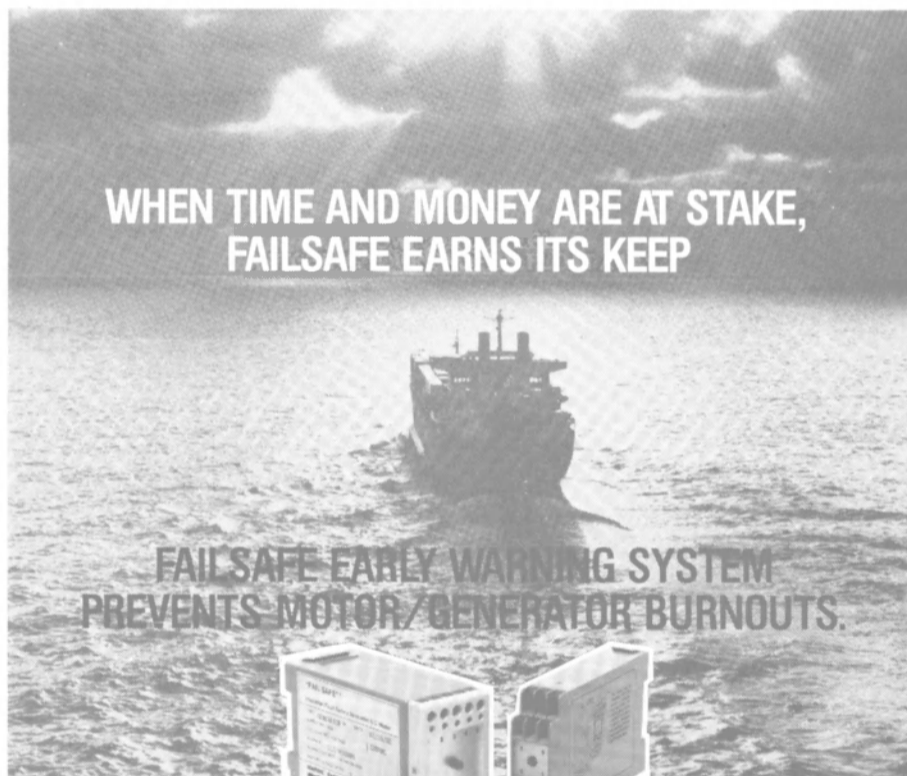
Peterson Builders' future holds



Side-launching of rescue/salvage vessel Safeguard (ARS-50) took place recently at Peterson Builders. She is first of four of a new class building at the Wisconsin yard.

the bright promise of many more Navy launchings. In addition to the four ARS-50 Class ships under contract, construction is also under way on the 224-foot, wooden-hull Mine Countermeasure Ship

(MCM), as well as seven 108-foot Yard Patrol Craft, also built of wood. The latter will be used by the U.S. Naval Academy for training midshipmen in navigation and vessel handling.



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For more information, call or write us now  
You'll never regret the money FAILSAFE can save you.



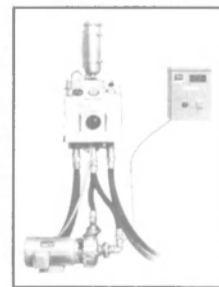
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Each figure listed below represents the number of inquiries produced for an individual advertiser by Maritime Reporter in a period of one year or less. These numbers are typical samples. Maritime Reporter, in the past year, carried the advertising of 780 different companies.

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432	341
389	322
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296	233
288	220
247	159
231	115
<b>Controls/Monitoring/Steering</b>	<b>Oily Water Separators</b>
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271	335
260	309
246	242
233	225
<b>Propellers/Thrusters</b>	<b>Valves/Fittings/Bearings (Shaft Couplings)</b>
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250	223

# Your advertising belongs in the proves it produces



# ADVERTISERS ER SALES LEADS

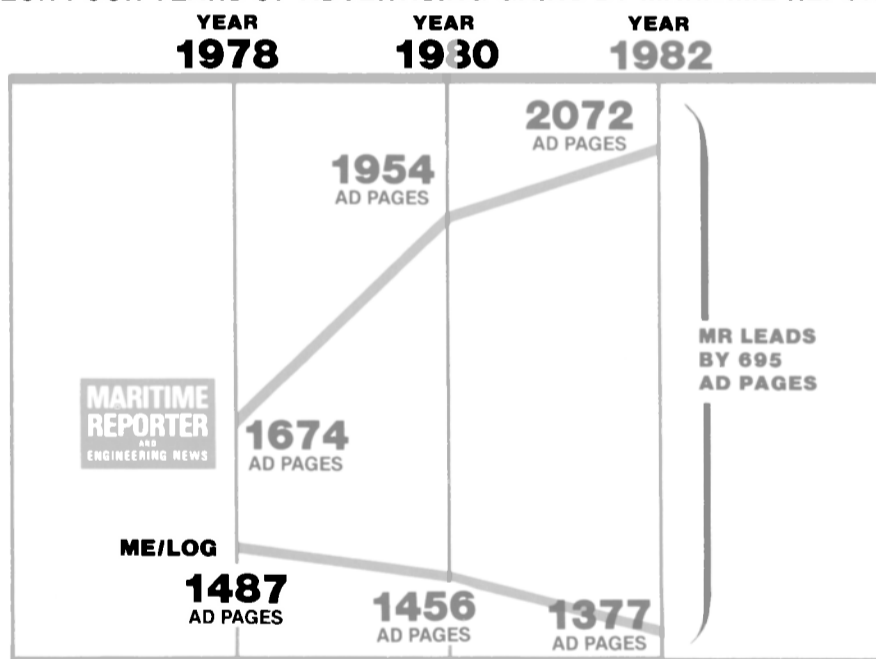
As a result, Maritime Reporter produces far more sales leads and better quality sales leads than other marine magazines.



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Jackup drilling rig Nengue Sika slides down the ways at recent Promet launch.

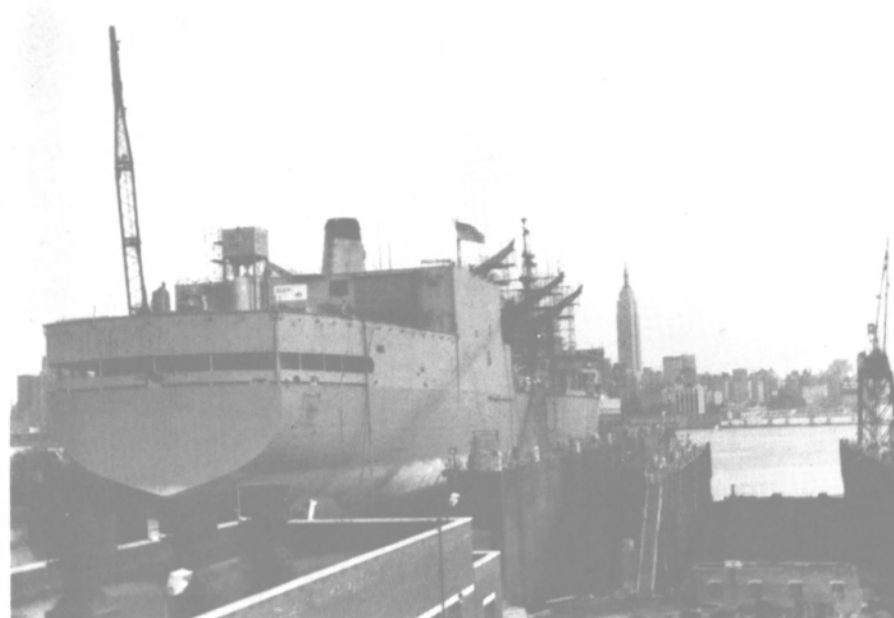
## Jackup Rig For West Africa Launched At Promet Yard

A BMC-300 design jackup rig ordered by West African Drilling Investment was launched recently at the Singapore yard of Promet Private Limited. When delivered in early 1984 the \$50-million rig Nengue Sika ("silver island" in Gabonese) will be drilling for Elf Gabon off the coast of Gabon.

This mobile, self-elevating cantilever jackup rig will be capable of working in water depths up to 300 feet and drilling to a maximum depth of 25,000 feet. The hull platform measures 212 by 210 by 26 feet, and each of the three

triangular, open-lattice truss legs is 423 feet long.

Prominent features of Nengue Sika include four levels of fully air-conditioned living quarters that can accommodate 95 people, galleys, two messrooms, hospital, radio room, and two recreation rooms. On deck the rig has two cranes, each with a boom length of 110 feet, and a helideck that is capable of supporting the weight of a fully loaded Sikorsky S-61N helicopter. The rig has been constructed to American Bureau of Shipping class and to International Maritime Organization standards.



## Work Progressing On USS Kalamazoo Overhaul At Hoboken Shipyards

Hoboken Shipyards, Inc. is in the midst of the \$14.25-million overhaul of the replenishment oiler USS Kalamazoo (AOR-6) shown above in the yard's 26,000-ton floating drydock. In addition to this dock, the Hoboken, N.J., facility has three other drydocks with lifting capacities of 16,760, 14,200, and 7,500 tons.

A subsidiary of BSI Corporation, Hoboken Shipyards has been in operation since acquisition from Bethlehem Steel Corporation in January 1983. Current work force numbers approximately 400 employees.

Responsibility for work in hand that Bethlehem started was assumed by the company and completed without interruption. To date, more than 100 ships have been serviced at the yard's Hoboken and Bayonne facilities, and some 140 non-ship jobs have been performed.

Hoboken Shipyards also operates the former Navy graving dock located at the Military Ocean Terminal Base in Bayonne, N.J., just north of the Kill Van Kull in Upper New York Bay. With its associated ship berths and shops, this dock adds a significant dimension to the repair capabilities of the Hoboken company, and to the size of vessels that can be serviced in New York Harbor.

The Bayonne graving dock is one of the largest on the East Coast, and can accommodate fully loaded ships up to a maximum length of about 1,080 feet and beam of 138 feet. This big dock is reserved exclusively for ship repair and maintenance.

## Hendry Seeks Title XI To Assist In Financing \$7.5 Million Dredge

The Maritime Administration has received a request from Hendry Corporation Tampa, Fla., for a Title XI guarantee to aid in financing the construction of a cutterhead suction dredge. The 200 by 54 by 16-foot vessel will be powered by four 2,875-bhp horsepower GM diesels. It is expected to operate in the coastal waters of the United States.

If approved, the Title XI guarantee would cover \$5,625,000, or 75 percent of the estimated cost of \$7.5 million. No builder has yet been selected, but delivery is anticipated in October 1985.

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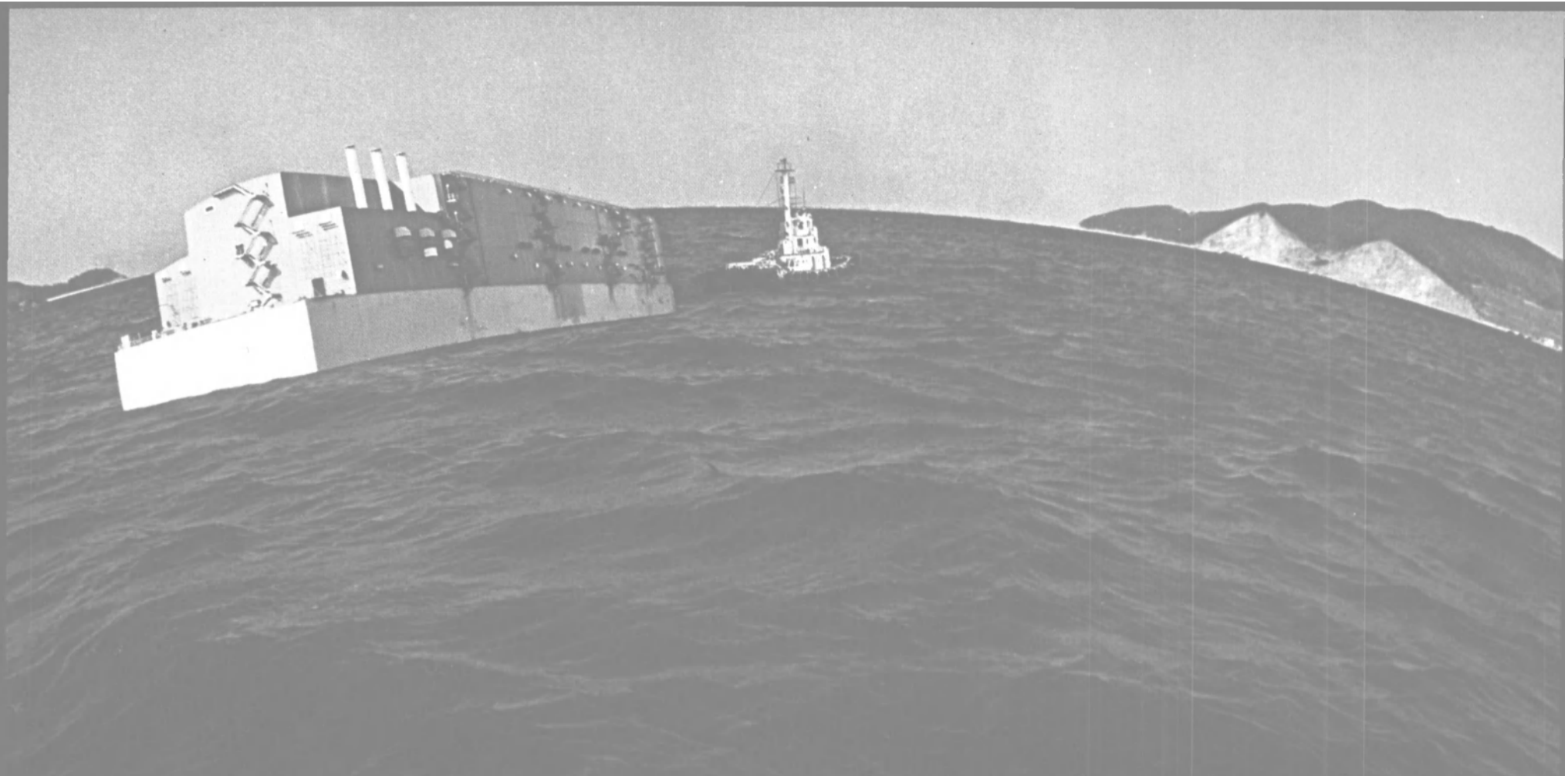
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That's when ARCO asked Daewoo to build them a Seawater Treating Plant, a first-of-a-kind facility that could maintain enough pressure in Arctic waters to keep oil production at 1.5 million barrels daily. It was Daewoo's S.J. Lee, project director, who made sure the massive structure was out of the Okpo Shipyard on time, even though many extra steps had to be taken to prepare the plant for 20 years of work in sub-zero marine conditions.

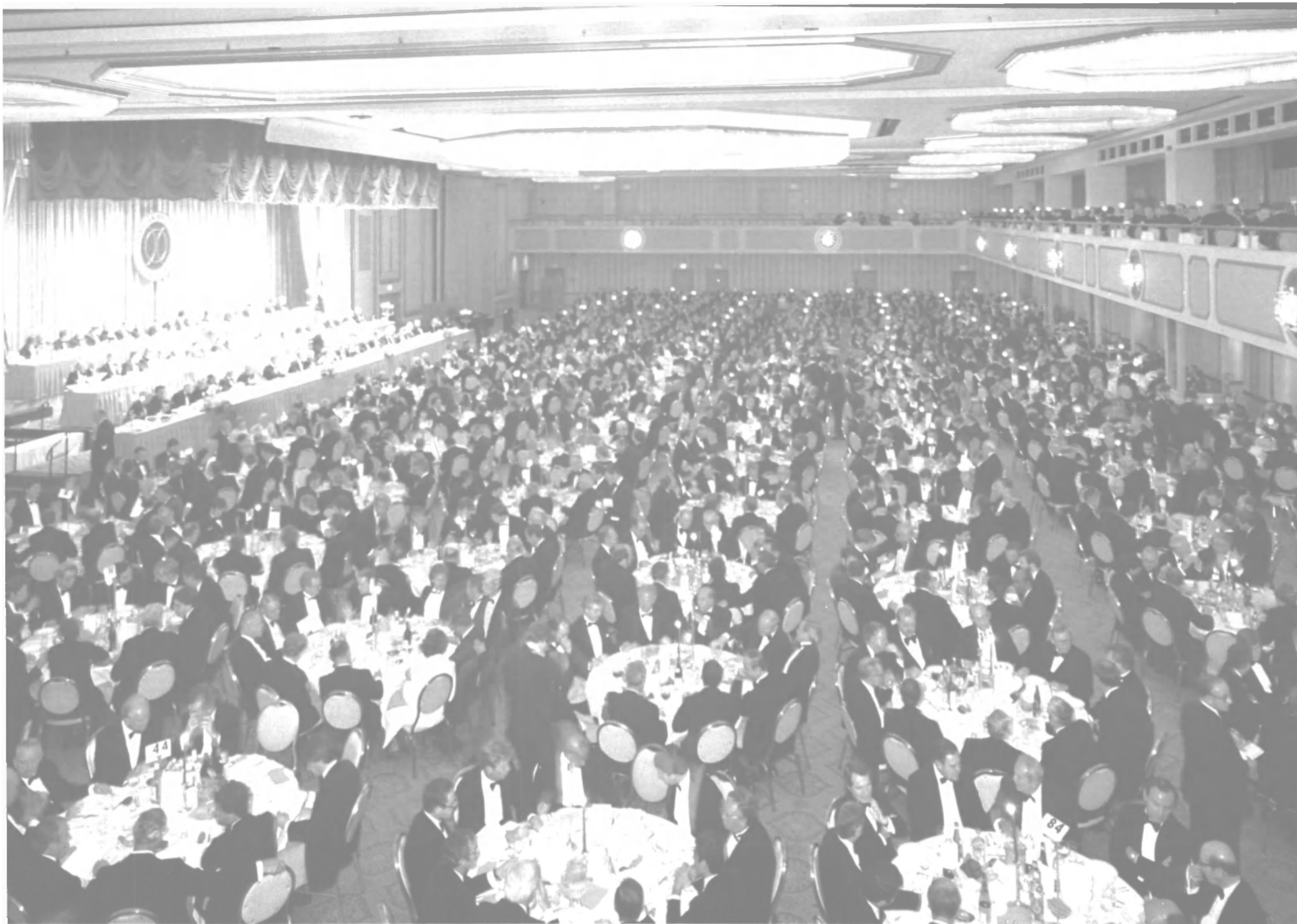


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# The 91st SNAME

## A Special Post-Meeting



The 91st Annual Meeting of The Society of Naval Architects and Marine Engineers, held on November 9-12 at the New York Hilton Hotel, again drew a large attendance at the banquet, technical sessions, and at the expanded Second International Maritime Expo-

sition, which this year saw 139 companies occupying more than 22,000 square feet of exhibit space in the hotel.

Presiding over the President's Luncheon and the Annual Banquet was SNAME president C. **Larry French**, president of National Steel and Shipbuilding Company, San Diego. Mr. **French** was elected to head SNAME at the 1982 Annual Meeting, and will serve as president until the end of 1984.

#### Officers Elected

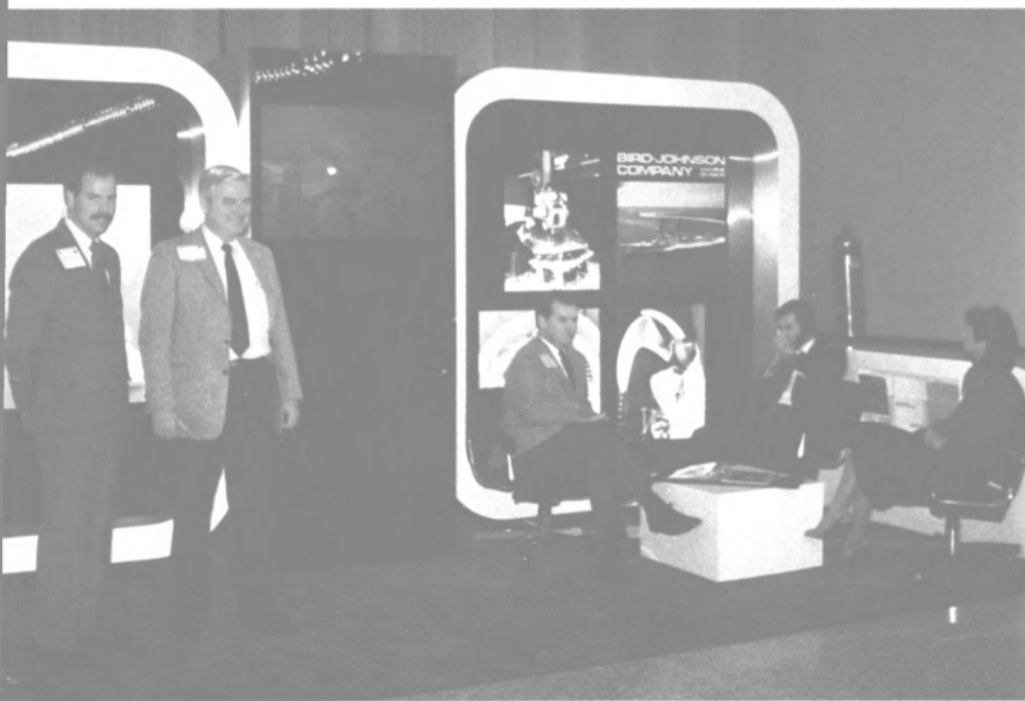
The SNAME Council met at the beginning of the Annual Meeting

and elected a number of new officers and honorary members. Elected honorary vice presidents (for life) were Capt. **Perry W. Nelson**, USN (Ret.), executive vice president of M. Rosenblatt and Son, Inc., New York naval architects and marine engineers; and **George A. Uberti**, program manager with National Steel and Shipbuilding Company, San Diego.

Five new vice presidents were elected. Of these, the following four will serve for a term of three years: **Robert Herbert**, president, Herbert Engineering Corporation, San Francisco; Dr. **James A. Lisnyk**, deputy director, Naval Sea

Systems Command, Washington, D.C.; Capt. **Thomas A. Marnane**, USN, commander, Pearl Harbor Naval Shipyard, Honolulu; and **Donald E. Ridley**, vice president, Bird-Johnson Company, Walpole, Mass. Serving a one-year term is **Malcolm I. Comyn**, naval architect, Esso Resources Canada, Ltd.

Re-elected as SNAME officers for one-year terms were: **Robert G. Mende**, secretary and executive director; **Robert Axelrod**, treasurer, and **Donald M. Birney**, assistant treasurer. Mr. **Axelrod** is vice president of J.J. Henry Co., Inc., and Mr. **Birney** is assistant vice president of the



# Annual Meeting And Exposition Report

American Bureau of Shipping, both in New York City.

In addition, the Council elected as honorary members (for life) **Robert P. Giblon**, recently retired president of George G. Sharp, Inc., and **Capt. Henry P. Rumble, USN (Ret.)**, senior developmental engineer at the Scripps Institute of Oceanography, San Diego.

## The Awards

Large audiences at the President's Luncheon and the Annual Banquet witnessed the presentation of coveted awards and prizes to prominent members of the Society.

At the banquet in the Grand Ballroom on Friday, November 11, SNAME's highest awards were presented to **Jens. T. Holm**, retired professor of marine engineering, Webb Institute of Naval Architecture; **Edwin M. Hood**, president emeritus of the Shipbuilders Council of America; and **Joe W. Key**, president of Key Ocean Services of Houston.

The prestigious David W. Taylor Medal "for notable achievement in naval architecture and marine engineering" is given annually. The recipient, Professor **Holm**, holds degrees from Webb Institute and from Brooklyn Polytechnic Insti-

tute. He was for 34 years a member of the Webb faculty, teaching in the disciplines of marine engineering and thermodynamics. He also authored some important SNAME publications.

**Edwin M. Hood**, who received the annual Vice Admiral "Jerry" Land Medal "for outstanding accomplishment in the marine field," retired in June 1983 as president of the Shipbuilders Council of America. For the 24 years prior to his retirement he was the national spokesman to the public and to Congress on behalf of the U.S. shipbuilding industry. Mr. **Hood** still serves the SBA as president

emeritus and consultant.

The Blakely Smith Medal is awarded biennially "for outstanding accomplishment in ocean engineering." It was presented to **Joe W. Key**, who for the past 25 years has been engaged in the application of engineering science to the solution of naval and industrial problems in the oceans.

At the President's Luncheon held on November 10 the following awards were made:

The Captain Joseph H. Linnard Prize for 1983 was presented to **John P. Breslin, Carl-Anders Johnson, Justin E. Kerwin**, and  
(continued on page 22)



**91st SNAME  
Annual Meeting  
Special Report**

(continued from page 21)

**Robert J. Van Houten** for their paper, "Theoretical and Experimental Propeller-Induced Hull

Pressures Arising from Intermittent Blade Cavitation." This prize is given to the author or authors of the best paper contributed to the Transactions of the Society at its Annual Meeting the preceding year.

The best paper delivered before a Section of the Society gets the Vice Admiral E.L. Cochrane Award. This went to **Watt D. Burton Jr.**, for his paper, "A Survey

of Marine Steam Propulsion Plants for Commercial Ships in the 1980s," delivered at the Hampton Roads Section on April 14, 1983.

The Graduate Paper Honor Prize for 1983 was awarded to **Jonathan J. Shields** for his paper, "Containership Stowage: A Computer-Aided Pre-planning System," presented at the April 14, 1983 meeting of the Northern California Section.



SNAME president **C. Larry French** addressing the President's Luncheon.

The Undergraduate Paper Honor Prize for 1983 was awarded to **Tamara S. Upham** for her paper, "Analysis of Japanese Ship Contract Price Data from 1975 to 1979," given before the Great Lakes/Great Rivers Section on January 21, 1983.

The Graduate Paper Award was given to **George Triantafyllou** for his paper, "Behavior of Elastic Membranes in a Current for Applications in Uranium Extraction," presented on January 27, 1983 at the New England Section.

**Hendrik F. Van Hemmen** received the Undergraduate Paper Award for his paper, "The Monoform Slip Concept: Design Principles and Preliminary Performance Characteristics," delivered at the Chesapeake Section on May 25, 1982.

A Certificate of Appreciation was given to **Monroe D. Macpherson** for his outstanding service as chairman of the Sections Committee from 1970 to 1982, and the Society's most immediate past president, **John J. Nachtsheim**, received a Presidential Certificate of Appreciation. The President's Luncheon awards ceremony concluded with the presentation (in absentia) of Golden Award 50-Year Membership Certificates to Capt. **Oscar Stiegler**, USN (Ret.), and **Edgar Svikis**.

**The President's Address**

In his annual address delivered at the President's Luncheon, Mr. **French** gave some observations on National Defense and the changing views our government has had on what is required as a government-funded national defense program. He also proposed a program that he thinks would improve our national defense capabilities, aid our maritime and "smokestack" industries, and improve the tax base.

To begin with, Mr. **French** offered a different view of what national defense is: "The first concept most people have of national defense is the armed forces. We have become used to thinking of the three branches of our national defense—Army, Navy, and Air



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Force. Those of us in the maritime industry have tried to emphasize the thought that there is a fourth branch or leg of national defense—the maritime industry. We include ships, crews, and at least those of us in the business of shipbuilding as components of this fourth leg.

"I would suggest that we revise this concept and recognize a fifth leg, the industrial base, and I would also suggest that shipbuilding is a part of the fifth leg, not the fourth leg.

"Let's look at changes in the relationship of the government and various legs of national defense under this five-leg concept. First consider the armed forces, the first three legs. If my recollection of American history is correct, the creation of a standing army was a development taking many years. Militia or reserves, unpaid by the Federal Government, existed before the standing army. Paid mercenaries were also part of our national defense in earlier days.

"The first naval vessels were not government owned and crewed but were privateers, owned and crewed by civilians. Even after a Navy using government ships and crews was created, privateers were used to supplement the nucleus Naval force.

"The fourth branch, or maritime industry, has also seen significant changes, just as drastic as the armed forces. In the early days we were a maritime country; most of our population and our cities were situated on the coasts. Our early economy depended on imports from Europe and exports of our agricultural endeavors. A maritime industry developed based on the American-developed and built fast clipper ships, and our merchant marine and shipbuilding industries were both financially sound industries; the assets of these private enterprises were available to the country when needed for national defense.

"As our country expanded, more of our economic strength was devoted to developing our land between the coasts, and the maritime industry was not as critical to the economy of the country as it had been. Other countries whose economies continued to be mainly driven by international trade filled the voids created when our economy turned heavily to domestic interests. The international trade of the United States changed from a trade dominated by U.S. vessels to one primarily carried in foreign ships. The net result was a greatly decreased privately financed U.S. merchant marine industry. We never have recovered from this condition, as other maritime nations have defended their maritime industries from any attempts that the United States private firms make to recover any large amount of our international trade.

(continued on page 24)



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## 91st SNAME Annual Meeting Special Report

(continued from page 23)

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### Mr. French's Proposal

"I would like to offer a concept

of how our fourth and fifth legs of defense could be strengthened in a manner which I believe would have minimal cost and possibly a reduction of cost to the taxpayers. My proposal involves shipbuilding as a key element, to the surprise of no one here I am sure. Actually, my proposal is a modification or extension to the Boggs Bill (HR-6979). This Bill proposes that cargo reservation on bulk shipments be invoked in increasing amounts. The current percentage of bulk materials imported and exported by the United States shipped in U.S.-built, owned, and crewed ships is less than five percent.

"The Boggs Bill proposes this percentage be increased at the rate of one percent a year until a maximum of 20 percent is reached. HR-6979 also proposes that ship construction and crew costs be reduced in order to minimize the cost differential between U.S. and foreign-built ships. The proponents of this Bill estimate that more than 250 ships would be built in the 15 years of the program.

"What I propose is that ships built for the cargo preference trade be built with American components. I also propose this requirement be a true Buy American

Law. If shipbuilders have to buy American-manufactured equipment but the equipment manufacturers buy foreign-made castings, forgings, or steel, or steel mills roll plate from imported slabs, we do not maintain a viable industrial base and in times of emergency ships and other defense equipment could not be built by domestic industries. A study to determine what minimum industrial base is required to insure an ability for rapid expansion of our industrial capabilities in time of emergency should be made.

"Another approach would be tax breaks given to shippers which would reimburse them for the additional shipping costs charged by U.S. operators. I am sure that there are no end of ways our bureaucrats in Washington can devise to resolve this problem once the concept of general taxes being used is accepted.

"I personally believe that the actual costs to the taxpayers would be little, if anything. The jobs created by the program plus the other jobs created in the general economy as a by-product of the program would generate taxes and reduce government support program costs in many ways. A program which improves our national de-

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Ralph L. Lewis Jr., corporate communications coordinator for Gulf Oil Corporation, was the principal speaker at the 91st Annual Banquet held on Friday evening, November 11, in the Grand Ballroom of the New York Hilton. A retired vice president of Gulf Oil, Mr. Lewis spoke on the subject of energy, an issue that is still with us. His topic covered a wide range of social, economic, and political activities that surround the worldwide search and development of energy sources.

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## 91st SNAME Annual Meeting Special Report

(continued from page 25)

- Frank S.F. Chou, Susobhan Ghosh, and Edward W. Haung, "Conceptual Design

- Joseph D. Porricelli, J. Huntly Boyd, and Keith E. Schleiffer, "Modern Analytical Techniques for Salvage Engineering Using Portable Computers,"
- Thomas V. Kotras, Andrew V. Baird, and John N. Naegle, "Predicting Ship Performance in Level Ice;" and
- Alexander C. Landshure

man, William R. Bertsche, John W. Boylston, Haruzo Eda, Virgil F. Keith, Ian R. McCallum, Eugene R. Miller Jr., and Abraham Taplin, "Design and Verification for Adequate Ship Maneuverability

gining of this article, the Second International Maritime Exposition that ran concurrently with the SNAME Annual Meeting was again a huge success. The number of exhibitors grew to 139 and the area covered by the exhibits expanded to some 22,000 square feet—about 8,000 square feet bigger than the first exposition held





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Past president John J. Nachtsheim (left) was given Certificate of Appreciation by current president French.



Monroe D. Macpherson (right) was presented with a Certificate of Appreciation by president French.

served in Gulf's coal, shale, geothermal, solar, nuclear, and uranium operations.

#### Technical Sessions

Chairman **Jack A. Obermeyer** and his Papers Committee again produced a lively and informative technical program, with distinguished SNAME members and guest authors presenting 12 papers on topics ranging from a computer program for recreational powerboats to predicting ship performance in ice.

One presentation in particular generated more comment and controversy than any paper in recent years. It was titled, "The Jones Act: Foreign-Built Vessels in the Domestic Shipping Industry," by **Warren G. Leback**, MarAd's deputy maritime administrator, and **John W. McConnell**, who is with the Washington office of the law firm of Haight, Gardner, Poor & Havens.

The essential thrust of the Leback-McConnell paper was that with introduction of foreign-built and foreign-rebuilt ships in U.S.-flag liner trades, vessels constructed or reconstructed in shipyards abroad should be permitted in U.S. domestic trades. They propose amending the Merchant Marine Act of 1920 (the Jones Act) to provide eligibility in domestic shipping for: re-flagged, U.S.-built vessels; U.S.-built, foreign-rebuilt, U.S.-documented vessels; new foreign-built, U.S.-documented vessels not less than three nor more than 10 years of age, U.S.-owned for not less than three years; U.S.-flag vessels built with construction-differential subsidy (CDS), without repayment of CDS but subject to "charge" levied on basis of estimated foreign cost used in determination of CDS.

The authors would also repeal the Jones Act restriction on foreign-built, U.S.-documented vessels transporting passengers in U.S. coastwise trades, and the 50-percent ad valorem duty on foreign repairs to U.S.-flag vessels.

Among the dozen or more attendees who spoke in opposition to the Leback-McConnell paper were: **M. Lee Rice**, president of the Shipbuilders Council of America, who called it "a travesty of fundamental national policy"; **David H. Klinges**, vice president of Bethlehem Steel's Marine Construction Group; **Edward Renshaw**, chairman of the St. Louis Ship Division of Pott Industries; **D. Ward Fuller**, president of American Steamship Company; **James E. Turner**, vice president of marketing, Newport News Shipbuilding; and **Gerald Seifert**, counsel of the House Merchant Marine and Fisheries Committee.

The other distinguished authors and their papers included:

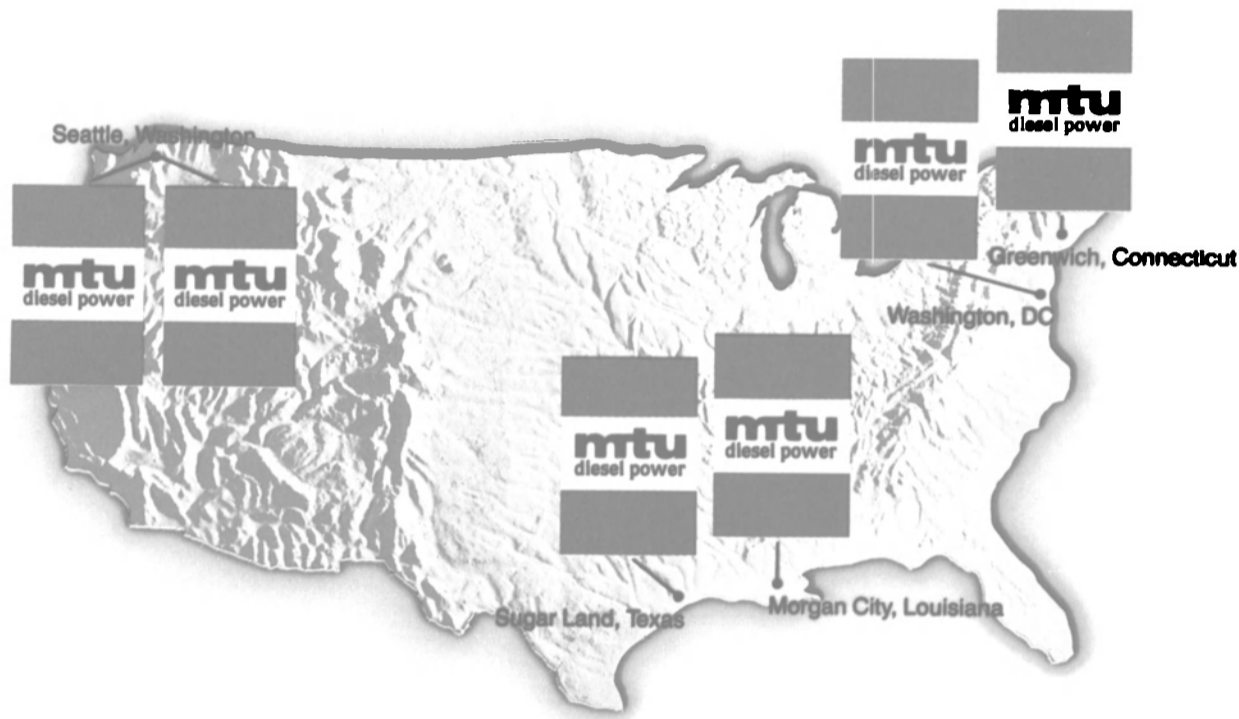
- **Dale E. Calkins**, "An Interactive Computer-Aided Design Synthesis Program for Recreational Powerboats;"

- **Petros A. Lalangas** and **Panayiotis L. Yannoulis**, "Design and Construction of a 25-M High-Speed Aluminum Motor Yacht;"
- **Ake Williams** and **Hans Liljenberg**, "Revival of the Flettner Rotor—Beneficial or Not for Merchant Vessels, Fishing Boats and Recreational Craft?;"
- **Yung-Kuang Chen**, **Lembit**

- **M. Kutt**, **Christopher M. Piaszczyk**, and **Maciej P. Bieniek**, "Ultimate Strength of Ship Structures;"
- **Miro Kresic** and **Bruce Haskell**, "Effects of Propeller Design Point Definition on the Performance of a Propeller/Diesel Engine System with Regard to In-Service Roughness and Weather Conditions;"
- **Richard J. Baumler**, **Toshio**

- **Watanabe**, and **Hiroshi Huzimura**, "Sea-Land's D9 Container Ships—Design, Construction and Performance;"
- **N. Pharr Smith**, **David B. Lorenz**, **Carl A. Wendenburg**, and **John S. Laird**, "A Study of Drag Coefficients for Truss Legs on Self-Elevating Mobile Offshore Drilling Units;"

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(continued from page 25)

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- Joseph D. Porricelli, J. Huntly Boyd, and Keith E. Schleiffer, "Modern Analytical Techniques for Salvage Engineering Using Portable Computers;"
- Thomas V. Kotras, Andrew V. Baird, and John N. Naegle, "Predicting Ship Performance in Level Ice;" and
- Alexander C. Landsburg, James C. Card, C. Lincoln Crane, Jr., Philip R. Al-

man, William R. Bertsche, John W. Boylston, Haruzo Eda, Virgil F. Keith, Ian R. McCallum, Eugene R. Miller Jr., and Abraham Taplin, "Design and Verification for Adequate Ship Maneuverability"

**Second International Maritime Exposition**  
As mentioned briefly at the be-

ginning of this article, the Second International Maritime Exposition that ran concurrently with the SNAME Annual Meeting was again a huge success. The number of exhibitors grew to 139 and the area covered by the exhibits expanded to some 22,000 square feet—about 8,000 square feet bigger than the first exposition held in 1982.

The companies exhibiting were a "who's who" of the maritime industry; included were many naval architecture firms, shipyards, engine manufacturers, and suppliers of all kinds of marine equipment and services. While most of the exhibitors were American companies, there were quite a number of firms from abroad represented.

Any exhibition is only as good as its attendance, and the traffic in the Rhinelander Gallery at the Hilton was brisk. More importantly, it was "quality" attendance, with few if any teenagers or boys in short pants filling shopping bags with literature from every stand.

For information on exhibiting and other details on the Society's Third International Maritime Exposition, which will take place November 15-16, 1984,

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**General Dynamics Gets \$3.5-Million Increase For Navy Planning Services**

General Dynamics, Electric Boat Division, Groton, Conn., has been awarded a \$3,537,243 face-value-increase to a previously awarded cost-plus-fixed-fee contract for planning yard services for the nuclear-powered, guided-missile cruisers during fiscal year 1984. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

**EMD Expands Its Sale Staff At Houston Office**

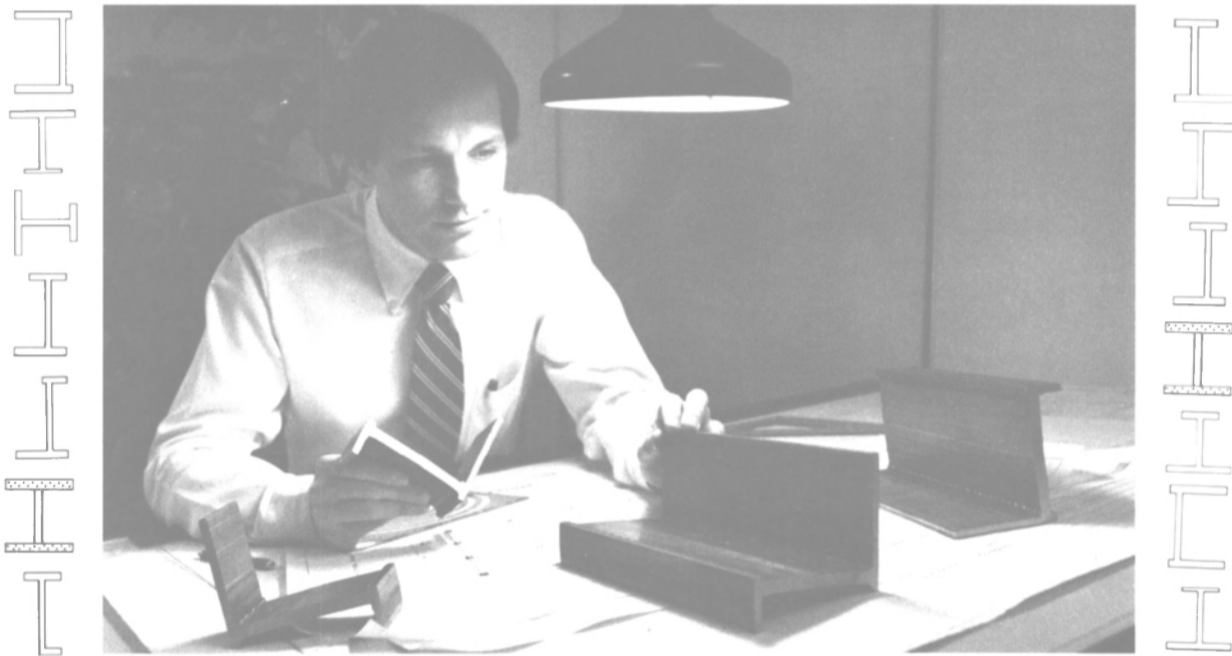
The Electro-Motive Division of General Motors Corporation recently announced an increase of sales staffing at its Houston office. The expansion provides for the addition of three professionals at the company's primary sales office serving the petroleum industry.

EMD is the world's leading manufacturer of medium-speed diesel engines for offshore oil drilling rigs and marine propulsion. Its Houston sales office serves customers in the southern United States.

In addition to its medium-speed diesel engines, EMD also manufactures electric motors, generators, and control equipment used for petroleum exploration and development. Electro-Motive Houston office is located at One Allen Center, Suite 1000, Houston, Texas 77002.

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Welded Beam Company "CustomBeams" can make a dramatic difference in the integrity, scheduling and fabricating costs of your fabricated metal product.

Contact WBC now to get the full particulars.

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**Kaiser To Supply Anodes To Asia And Oceania**  
—Literature Available

Kaiser Aluminum & Chemical Corporation will manufacture and market aluminum anodes for cathodic protection in marine environments in Asia and Oceania, effective immediately. The anodes will be produced in Taiwan by the Metal Products Division of Kaiser Chemicals, a division of Kaiser Aluminum. Kaiser Chemicals has been a major supplier of sacrificial anodes for the protection of steel in corrosive environments for 30 years.

Primary product for marine applications is KA95, a highly efficient, mercury-type aluminum alloy anode, with maximum current output. The Taiwan manufacturing operation will produce flush-mount hull anodes, ballast tank anodes, platform, and multipurpose anodes.

For further information and free literature on Kaiser Chemical's anode availabilities and specifications,

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**\$7.6-Million Navy Contract For SINS And ESGM Work Awarded To Rockwell**

Rockwell International Corporation, Anaheim, Calif., has been awarded a \$7,631,000 cost-plus-fixed-fee contract for the FY-84 United States/United Kingdom Ships Inertial Navigation System (SINS) and Electrostatically Supported Gyro Monitor (ESGM) instrument repair program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

**Sonat Forms New Subsidiary, Acquires S&H Diving Corp.**

Sonat Inc. of Birmingham, Ala., recently established a new subsidiary, Sonat Subsea Services Inc., and has acquired S&H Diving Corporation, the largest independent diving contractor serving the Gulf of Mexico area, with annual revenues of \$10 million. S&H Diving, headquartered in Morgan City, La., was acquired for \$4 million in cash and certain other considerations.

"We have long viewed the international underwater services industry as an attractive and logical extension of our offshore drilling business," said **Henry C. Goodrich**, chairman and chief executive officer of Sonat. Mr. **Goodrich** also announced that **Bruce C. Gilman**, formerly president and chief operating officer of Oceaneering International, Inc., joined Sonat Inc. earlier this year and has been elected president and chief operating officer of Sonat Subsea Services.

**Navy Extends Contracts With COMSAT General For Use Of MARISAT**

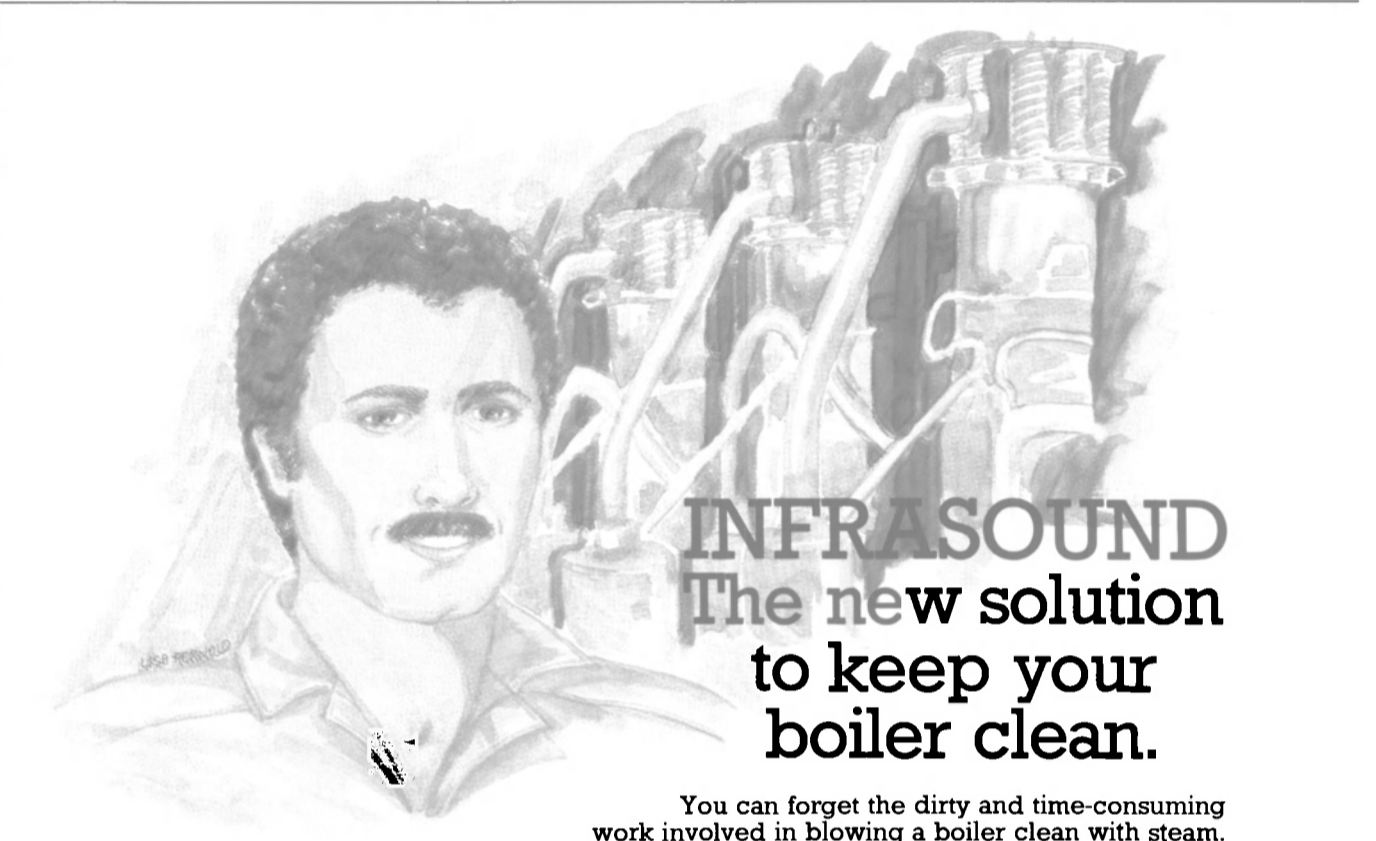
COMSAT General Corporation announced recently that the U.S. Navy has extended its contract for the use of UHF capacity on each of the three satellites in the MARISAT system for an additional year. The provision of this addi-

tional satellite service is valued at \$12.7 million. The Navy also has an option on these satellite services for the following year.

Developed, owned and operated by COMSAT General, MARISAT is the world's first maritime communications satellite system. Each of the three satellites operate in three different frequencies: UHF for Navy services, and L-Band and C-Band for commercial shipping

and offshore industries.

The MARISAT system first began providing communications services to the U.S. Navy in 1976. COMSAT General leases the commercial capacity of the system to the 40 nation-member International Maritime Satellite Organization, INMARSAT, which provides communications satellite services to 2,000 ships and offshore platforms.



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## Will Connelly Named Head Of Marketing Operations For MAR, Incorporated

Will Connelly has been named to head marketing operations for the Marine Services Division (MSD) of MAR, Incorporated, according to Allan L. Yoder, vice president and division director.

MAR is a scientific research, de-

velopment, and engineering firm with strong commitments to the U.S. Navy in the fields of acoustics, ocean engineering, and hydrodynamics. The Fort Lauderdale-based MSD is the ship operations and marine systems arm of the Rockville, Md., headquartered company.

Mr. Connelly had previously occupied marketing posts with U.S. Technology Corporation and Tracor Marine in Fort Lauderdale.

## Kockums Profit Continues With Backlog of Orders Worth SEK 4,700 Million

As of the first eight months of this year, Kockums AB of Malmo, Sweden shows a surplus of SEK 31 million (last year 39+ million) and expects a surplus for the entire year equal to that of 1982 (SEK 56 million). The eight-month report indicates that the value of

the order backlog at the end of the period amounted to SEK 4,490 million. Since then, the last in a series of four RO/RO ships for Saudi Arabia has been delivered and a contract has been signed for two car transport ships for the Wallenius Shipping Company of Stockholm. The value of the order backlog now stands at SEK 4,700 million and provides full coverage until 1987 for the lower level decided upon.

The turnover for the whole year is expected to be more than SEK 1,400 million, of which 1,300 million is for export. "The order backlog now gives us the opportunity to make further efforts to streamline the company and carry out development in areas of strategic importance to us," says Kockums' president Goran Herslow.

## Marpol/Solas Compliance Subject Of 60-Page Book Offered By Intertanko

Guidance for owners on compliance with the International Convention for the Prevention of Marine Pollution (MARPOL), 1973/78, which enters into force October 2, 1983, has been issued by the International Association of Independent Tanker Owners (Intertanko).

This new guide—also covering SOLAS 1978—deals with requirements for upgrading existing tankers. In addition, it examines the impact on operational procedures and reviews commercial implications.

While some tanker owners may have postponed preparations for compliance, Intertanko also points out that some Administrations also seem to have started rather late in establishing new approval/certification procedures.

Questions raised in order to achieve compliance are explained in the guide. These include: Crude oil washing; Inert gas systems; Oily water monitoring; Port state control; Reception facilities; Commercial considerations, and others.

Copies of the guide, "1983—the Year of Implementation—MARPOL/SOLAS," are available from: Intertanko, PO Box 1452 Vika, Radhusgaten 25, Oslo 1, Norway. Telephone: (472) 41 60 80; Telex: 19751 ITANK N.

## Harland & Wolff To Build And Market Friendship Multi-Purpose Cargo Ship

A unique cooperation agreement that covers the building and marketing of the highly successful Friendship type multi-purpose cargo vessel has been signed between two of the world's leading shipbuilding yards. The agreement, signed between Harland and Wolff Limited and Algoship International Limited in association with the Japanese shipbuilder Ishikawajima-Harima Heavy Industries Co., Ltd., covers the construc-

# VEROLME DO BRASIL: 100% in the shipbuilding market

VEROLME DO BRASIL has now become the largest Brazilian private capital shipyard.

It employs 7 thousand persons and in its yard, which occupies a whole town (12 million square meters), ships of any type and size up to 600,000 TDW can be built.

From its three slipways and one drydock of 80 x 70m, specially designed to build offshore equipments, more than 80 ships and platforms of several sizes, totalizing more than 2 million TDW, have been launched.

VEROLME DO BRASIL has annually invested around US\$ 10 million in the improvement of its shipyard, thus keeping pace with worldwide technological development, providing the yard with the most modern design and production processes.

VEROLME DO BRASIL is placed today among the best equipped and most efficient shipyards in the world, capable of meeting demands from the shipbuilding and offshore market all over the world.



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tion in Belfast, and the marketing worldwide of the Friendship HT type dry cargo vessel designed by the international firm of naval architects G.T.R. Campbell of the Bahamas. It is believed to be the first time that such an agreement has been signed between a North European shipbuilder and a Japanese shipbuilder.

The Friendship series of vessels are designed to cope with the substantial increases in fuel costs and associated operational factors including changes in the variety of cargoes which medium sized multipurpose cargo vessels are being called upon to carry in the present economic climate. The versatility of the series makes it possible to switch easily from general cargoes to containers and to maintain ship administration efficiency onboard.

On the technical side, details of the existing design now held by I.H.I. will be provided to the Belfast yard, and future refinements and developments of the design will be available to both companies who will maintain close liaison to ensure that all vessels built under the agreement will each contain the same commercially advantageous performance characteristics and high standards of construction that have created the current market for the Friendship series vessels in both shipbuilding locations. The agreement also provides for regular interchange of personnel between the parties whereby the maximum benefits are obtained from this unique cooperation between two of the world's major shipbuilders.

On the marketing side, Harland and Wolff Limited have been granted exclusive rights to build in the U.K. and rights to offer the vessel on the world market.

### Nautilus Unveils New Crane With 40-Ton Lift Capacity—Literature Available

Fred Oprendek, president of Nautilus Crane & Equipment Corporation, has announced the availability of a new crane with lifting capacities of up to 80,000 pounds. Designated the 180L, the new crane is of lattice boom construction with an overturning moment design of 1,800,000 foot-pounds, and is designed to replace and standardize existing offshore equipment.

The 180L was designed by Earl Bares, chief engineer at Nautilus, to give offshore platforms, dock operators, and service vessels a modularly designed crane with good capacity and ease of maintenance. Features of the 180L include: 20-inch-diameter sheaves that are removable without disturbing pendant and line components; interchangeable gantries; right or left cab and/or power; easily accessible grease points; and optional centralized lube system.

For more information and free literature on the 180L and other Nautilus cranes,

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### Maritime Protection Unveils New Nitrogen Generator—Literature Available

Maritime Protection A/S of Kristiansand, Norway, recently introduced a new nitrogen generator for marine use. The unit is said to be particularly suited for ships in the chemical and gas trades, drilling rigs, and barges, and will be a convenient alterna-

tive to nitrogen bottles. The generator has no moving parts, is virtually maintenance-free, and light in weight.

The heart of the system is the technology of membrane gas separation designed and developed by the U.S.-based Monsanto Company. Prism separators made by Monsanto have gained wide acceptance in the chemical and petroleum industries, with 40 plants installed or on order since 1977.

The generators produce an inert atmosphere by removing oxygen from air. They have sizes presently ranging from 100 to 500 cubic meters per hour of high-purity nitrogen (95–99 percent pure) with a dew point of minus 70 C.

For more information and free literature on the new nitrogen generator,

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For the first time, every essential element needed by the watch officer for total ship course control is centered in one console—the Sperry SRP-2000 Ship Control System. Information formerly obtained from annunciators, remote indicators and communication relays is now displayed at this one control center using Sperry's advanced design concepts and digital microprocessor technology.

The SRP-2000 is an integral adaptive autopilot giving unparalleled fuel savings through precise monitoring of sea conditions by continually adjusting system gain settings for optimal steering.

In automatic navigation mode, the SRP-2000 provides route planning and automatic route tracking, based on SATNAV, LORAN, or manual fix inputs. These functions improve fuel efficiency by minimizing route distance.

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To free the watch officer for his command function, there is a fingertip call-up of step-by-step operating proce-

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Write to Sperry Corporation, Electronic Systems, Great Neck, NY 11020. Attention: Marketing Department.



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## \$30-Million Navy Contract On Landing Craft Awarded To Bell Aerospace Textron

A \$30-million contract for long lead time materials for the next six landing craft, air cushion (LCAC) vessels has been awarded to Bell Aerospace Textron, Division of Textron, Inc., New Orleans. This new contract, announced by **John J. Kelly**, senior vice presi-

dent and general manager of Bell Aerospace Textron, New Orleans Operations, and president of Bell Halter Inc., increases to 12 the number of LCAC craft to be produced at the Bell Halter production facility. Bell received a \$172-million contract for the first six LCACs in June 1981. Rollout of the first two LCACs is scheduled for 1984, with the third due in mid-1985.

The LCAC program is being

conducted at Bell Aerospace Textron's New Orleans Operations, established in 1969 to concentrate on air cushion vehicle and surface effect ship design and construction.

The LCAC is an amphibious air cushion vehicle that can travel at speeds up to 50 knots and can quickly transport troops, equipment, and weapons from support ships located over the horizon to dry ground beyond the beach. They are expected to replace the Navy's

current fleet of landing craft, which are of World War II design, dramatically improving the ship-to-shore capability of the Navy and Marine Corps.

## First Of Sulzer's New RTA Engine Series Powers Mitsubishi-Built Bulker

The first example of Sulzer's new RTA superlongstroke diesel engine series went to sea recently, just about 22 months after the new fuel-efficient series was announced to the shipping industry. The initial installation is a 7-cylinder 7RTA58 model powering the 80,000-dwt ore/bulk carrier Zaragoza, built for Wayland at the Nagasaki shipyard of Mitsubishi Heavy Industries Ltd. With a maximum continuous rating of 11,410 bhp at 105 rpm, it gives the ship a service speed of 13.9 knots.

The race to be the first RTA engine to go to sea has been closely run. The second installation was in the reefer Atlantic Universal, which went on sea trials only two weeks after the Zaragoza. This ship, also built at the Nagasaki yard, is also powered by a 7RTA58 engine but at the higher rating of 13,440 bhp at 123 rpm to give the ship a service speed of 20.1 knots.

Both 7RTA58 engines for these ships were built at Mitsubishi's Kobe engine works. The third RTA to go on sea trials was an IHI-built 5RTA58 for the Laeisz reefer/container vessel Puritan, building at IHI's Aioi yard. The fourth RTA, another 7RTA58 from Kobe, has been installed in the 14,000-dwt container/car carrier Rainbow Ace building at Mitsubishi's Kobe shipyard for Mitsui-OSK Lines.

## National Fluid Separations Appoints Bilge Master Sales Agent In Saudi Arabia

The Intercontinental Group, Al Khobar, Saudi Arabia, has been appointed sales agent for the BilgeMaster™ bilge pollution control system in Saudi Arabia and nearby Arab states by National Fluid Separators, Inc., St. Louis. The BilgeMaster System is certified to IMO standards and approved by the U.S. Coast Guard. The announcement was made by **W.W. Matthews**, president of National Fluid Separators.

## Brochure Available On Shipboard Furniture Made By Comfort-Mate

Miami-based Comfort-Mate, Inc. offers a line of deck chairs (lounges), sitting chairs, bar stools, tables, and other items designed and manufactured specifically for the marine environment, with quality standards much higher than normal outdoor furniture.

Chairs and stools are made of commercial grade anodized aluminum, stainless steel hardware, and

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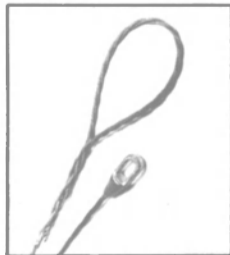
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After years of innovative designing and extensive research I & I Sling

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### John Batten Retires As CEO Of Twin Disc, Inc.

**John H. Batten**, chairman and chief executive officer of Twin Disc, Incorporated of Racine, Wisc., has retired as CEO but will continue in his capacity as chairman of the board of directors. **Roger D. DeLong**, formerly president and chief operating officer, has been appointed to the new position of vice chairman of the board and chairman of the Management Executive Committee. Succeeding him as president and also named chief executive officer is **Michael E. Batten**, formerly executive vice president. **Leroy J. Burlingame**, previously senior vice president-manufacturing, was elected executive vice president.



Michael Batten

Other officer changes include **Donald D. James**, vice president-domestic manufacturing, who will handle all manufacturing operations at the company's Racine and Rockford facilities. **James McIndoe**, formerly director-international marketing, was elected to the additional post of assistant secretary.

### \$5-Million Funding Awarded To Raytheon For R&D On Navy's Satcom Program

Raytheon Company, Sudbury, Mass., has been awarded a \$5-million modification for incremental funding under a previously awarded cost-plus-fixed-fee research and development contract for the Navy's EHF satellite communication program. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity.

### American-Standard Opens New Jersey Repair Plant —Literature Available

American-Standard's Heat Transfer Division, headquartered in

December 15, 1983

Buffalo, N.Y., recently announced the opening of a full-capability, regional repair facility in Elizabeth, N.J. The announcement was made by **Peter D. Roome**, vice president and general manager of the Division.

The new heat exchanger repair plant is fully equipped to retube, repair, or rebundle shell-and-tube heat exchangers up to 42 inches in diameter, 20 feet long, and 20,000-pounds. The facility can handle

any heat exchanger within these parameters regardless of original manufacturer. National Board "U" and "R" stamping is available. The plant handles retubing with ferrous, non-ferrous, stainless steel, or exotic materials, with bare or low-fin tubes. Most alloys are available from stock.

Regionally located for quick response to customer needs, the new facility's service capability—including unit pick-up and delivery—

is available seven days a week, 24 hours a day.

In addition to providing quick-response repair or rebundling for heat exchangers, the Elizabeth facility offers technical diagnosis and problem evaluation services based on American-Standard's more than 60 years of experience in heat exchanger design and construction.

For full information and free literature on this new facility,

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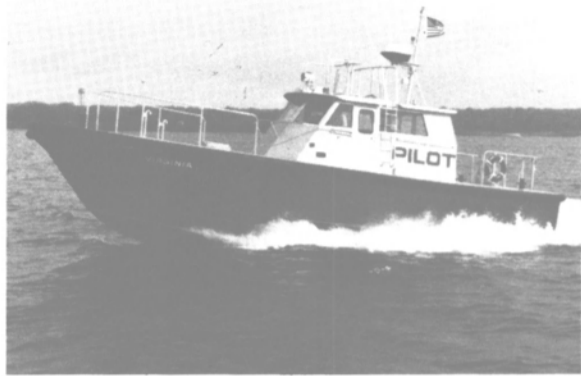
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## Gladding-Hearn Delivers Two Launches To Virginia Pilots



High-speed, all-aluminum launch Virginia is one of two completed recently by Gladding-Hearn Shipbuilding Corporation for Virginia Pilots Association. Both vessels are powered by GM Detroit Diesel Allison engines.

No matter what line of business you're in, prompt and responsive service to your clients is an absolute essential. No one recognizes this fact more than the Virginia Pilots Association of Norfolk, an organization that is continually looking for ways to improve its operations and better serve the ships that call at Virginia ports.

In line with this philosophy, the VPA recently initiated a major change that will eventually move its center of operations to a land-based control tower. To be built at Cape Henry, this modern, computerized tower will become headquarters for the Association, replacing its 48-year-old pilot station vessel.

Of course, when you plan to move your base of operations miles away from your actual sea duty area, you have to consider some other factors as well—like acquiring pilot boats that offer high speed, proven performance, and all-weather reliability. That's where Gladding-Hearn, the Somerset, Mass., shipbuilder came into the picture.

Completing a contract awarded in the fall of 1982, Gladding-Hearn recently delivered two 51-foot, fast pilot launches to the VPA. The all-aluminum, twin-screw vessels will play a pivotal role in the new scheme of operations for the Virginia Pilots. Designed by C. Raymond Hunt Associates of Boston, and featuring the proven Hunt "Deep-Vee" planing hull, these high-performance craft have been put into service as the first phase of the major operational change.

The new boats, named the Virginia and the Old Dominion, are the sixth and seventh in a class originally designed by Gladding-Hearn for the Delaware Bay Pilots. With a beam of 17 feet and draft of 4.5 feet, they have a top speed of 23 knots and will cruise at 20 knots. To be based at Lynnhaven River, the new launches will be directed by traffic controllers in the new land-based tower. The controllers will use the most modern guidance equipment and methods to coordinate arriving and departing ships with pilot assignments.

Powered by twin GM Detroit Diesel Allison engines, each rated for 350 bhp at 2,100 rpm, the launches feature clear flush decks and an amidships wheel house with cabin-top boarding platform. The hot-water-heated deck house provides raised reclining seats for four (including helmsman), as well as a full-width bench seat, and a full complement of instrumentation and communication/navigation equipment. Accommodations include two settee berths, head, and wash basin.

The Hunt-designed hull comprises four watertight compartments served by an engine-

driven bilge pump. Forward and aft decks are fitted with safety handrails and have heated walkways for de-icing. A water-level rescue platform is recessed into the transom.

The trend-setting change in operations being undertaken by the Virginia Pilots Association makes good sense in many ways—in economics, efficiency, and operational safety. When the move ashore is completed, the high costs of maintaining its aging pilot station vessel (about \$1 million a year) will be eliminated. Time will be saved for both the pilots and the vessels they serve, and pilots' exposure at sea in bad weather will be reduced significantly.

### VIRGINIA and OLD DOMINION Major Suppliers

Main engines (2)	Detroit Diesel Allison
Reduction gears (2)	Allison 1.97:1
Propellers (2)	Columbian
Propeller shafts (2)	Armco
Steering	Hynautic Hydraulic
Controls	Morse
Compass	Ritchie
Wheel	Edson
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VHF radio	Sailor
Depth sounder	Datamarine Kodiak
Horn	Raritan Coronado
Bilge pump	Jabsco
Fire extinguishers	Kidde
Battery charger	Pro-Mariner
Searchlight	Perko
Navigation lights	Aqua-Signal
Wipers	American Bosch
Fendering	Johnson Rubber
Seating	American Seating
Mufflers	Marine Mufflers

## Newfoundland's Windsor Cites \$93 Million In New Projects



Newfoundland's Minister of Development **Neil Windsor** (right) points to areas on map where investments of \$93 million will be made in maritime-related improvements. At left is **Eugene Becken**, president of New York Rotary Club.

In a recent speech before the New York Rotary Club, **Neil Windsor**, Minister of Development for Newfoundland, described some developments representing \$93 million in new maritime-related investments in his Canadian province.

**Mr. Windsor**, whose province is approaching a North Sea size offshore oil boom, said that the new developments include a \$30-million Syncrolift at the Newfoundland Dockyard in St. John's. That project, which just began operation, also features a side-transfer facility, three repair berths, a 45-meter-high tower crane, and other equipment.

A second project involves plans for a \$7-million dock for the repair of offshore oil rigs at Marystown Shipyard Ltd., which builds supply and service vessels. By reducing rig repair time by 40 percent, the proposed facility will save oil companies \$100,000 a day. This dock

will be the first of its type on the East Coast of North America.

**Mr. Windsor** also reported that the construction of a \$56-million Arctic Vessel and Marine Research Institute was proceeding on schedule and should be completed by November 1984. When completed, the facility will include one of the largest and most advanced ice tanks for arctic vessel research, permitting simulation of storm conditions with ship models up to 12 meters long.

## Hongkong United Yard Completes Steelwork Repairs To OCL Ship



Hull damage to Strathetrick caused flooding of two holds.

Hongkong United Dockyards Limited (HUD) recently completed steelwork repairs to the OCL vessel *Strathetrick*, which struck a sunken ship near Hong Kong in October. Damage was sustained to the shell, internals, and tank top in way of No. 2 and No. 3 holds over a length of approximately 30 meters (98.4 feet), and both of these holds were flooded.

The contactor room for the heavy-lift crane was also flooded, and all electrical equipment was first overhauled to allow the heavy-lift cargoes and general cargo in the flooded holds to be off-loaded. Containers on deck in these two areas also had to be removed.

When the vessel entered the drydock, 10 shell plates, four tank top plates, and 39 floors in way of the damage were removed. Also partially replaced were 14 frames and brackets above the tank top.



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Nylands Maskinverksted A/S of Norway, manufactures of new and reconditioned spare parts for most makes of medium- and slow-speed diesel engines, recently completed the first phase of expansion plans following the successful buy-out of the company from the Aker Group by employees and a consortium of banks.

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For a free copy of the new brochure and spare parts catalog,

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# We're making the best boat shafting longer--to 38 feet

## Armco AQUAMET

Now you can gain all the benefits of Armco® AQUAMET® Boat Shafting in longer length boat shafts. We've installed a new Precision Rotary Forge at our Baltimore, Maryland stainless steel producing facility to provide you with AQUAMET Boat Shafting in lengths up to 38 feet, depending on diameter and surface finish.

But that's not all this state-of-the-art equipment offers you. We're able to produce a straighter bar to tighter tolerances as forged. And time to produce shafting is reduced, so you get faster delivery.

Let us show you how we can meet your boat shafting needs better with this family of premium-quality Armco AQUAMET Boat Shafting:

AQUAMET 17—Outstanding strength, toughness and corrosion resistance for extra-rugged service.

AQUAMET 18—Economical strength, corrosion resistance and superior toughness.

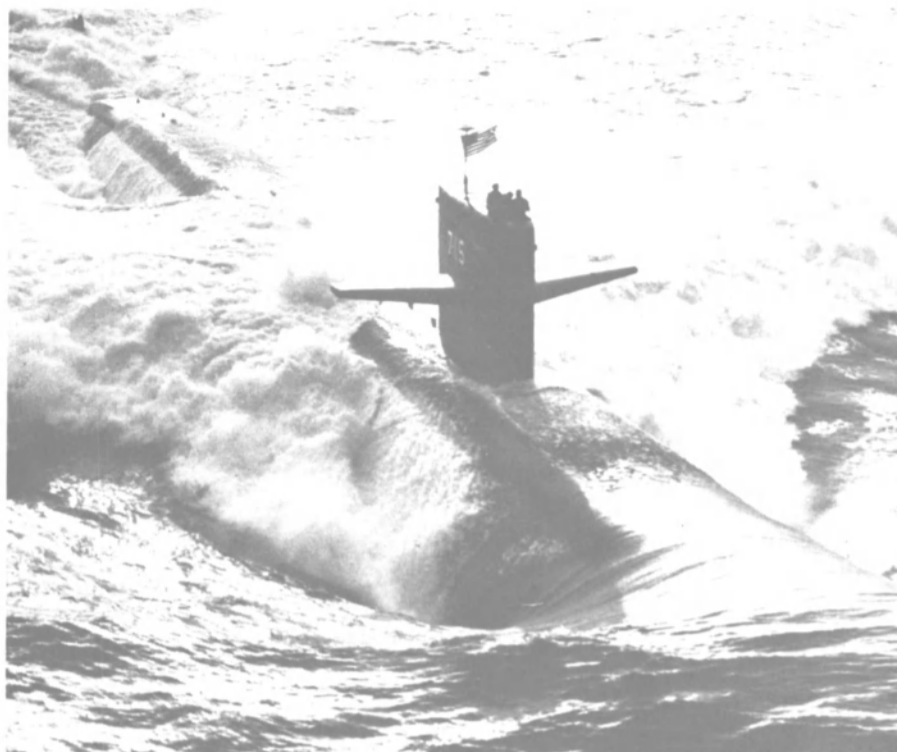
AQUAMET 19—Corrosion resistance better than AQUAMET 17 and 18, strength and corrosion resistance better than Type 304.

AQUAMET 22—Best seawater corrosion resistance plus excellent strength and toughness.

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Write us today for your free copy of the Armco AQUAMET Boat Shafting Product Data Bulletin. This 44-page bulletin contains complete mechanical and physical properties, corrosion resistance information, machining guidelines, and design curves. Armco, Stainless Steel Division, Dept. SS-143, Box 600, Middletown, Ohio 45053.

 **STAINLESS  
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DIVISION**



Latest submarine to join U.S. Navy fleet is Buffalo, built by Newport News Ship.

## Newport News Shipbuilding Delivers Attack Submarine Buffalo (SSN-715)

The country's newest attack submarine, the Buffalo (SSN-715), was delivered to the U.S. Navy recently by Newport News Shipbuilding. Her keel was laid January 25, 1980 and she was launched May 8, 1982. She was christened by Mrs. **Joanne Kemp**, wife of New York Congressman **Jack Kemp**, who was principal speaker at the launching.

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## New Specification Guide

contains information on parts and

## IMO Expands Its Line Of Geared Twin-Screw Pumps—Literature Available

The IMO® Pump Division of Transamerica Delaval Inc. has broadened its line of GTS® geared twin-screw pumps to include models with cases, internals, and relief valves of stainless steel, Monel, bronze and NiResist, as well

as those with standard internals of cast iron and carbon steel.

The new pumps are expected to find wide use in loading and off-loading extremely sour crudes, pumping very high metals content residues from atmospheric and vacuum towers and dirty bottoms from other process units.

With a viscosity capability that goes as high as  $4.5 \times 10^6$  SSU, GTS

pumps can help refiners take the very deepest cuts of HGO and will handle pitch, asphalt, tars and other residues even when towers temporarily lose heat—doing away with the need for cutter fluids and hydroblasters. Units get back on stream quickly.

GTS pumps will tolerate even the dirtiest streams as bearings are isolated from the pumped fluid.

They can run dry without damage, retaining prime until feed is restored. Capacities run from 20–7,000 gpm, discharge pressures to 600 psig, and temperatures to 700 F.

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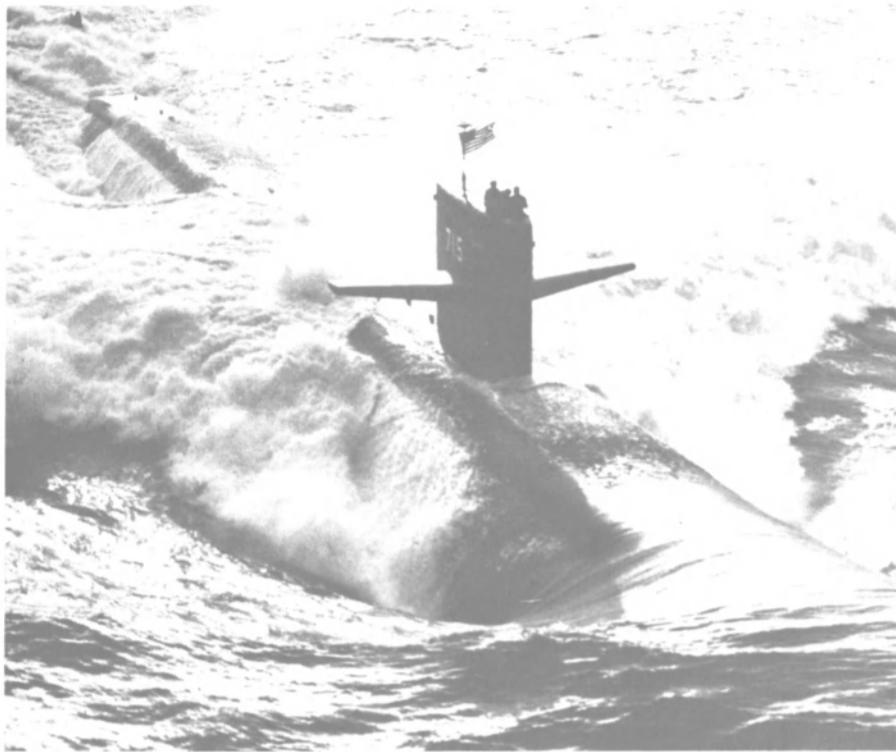
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A new specification guide, GEA 11250A shows that ratings for General Electric's line of marine and power generation diesel engines are up approximately 10 percent because of product improvements.

The new guide lists full technical specifications on GE's marine propulsion diesels, diesel-electric marine power modules, diesel-electric stationary modules, and diesel engine general design specifications. The publication also

contains information on parts and service, including a free 800 number action line.

To obtain a copy of GEA 11250A,

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## Wittlen Appointed Vice President At Trans Freight

**Elliot Wittlen** has been named vice president-administrative projects for Trans Freight Lines. The announcement was made by **Roger Giacometti**, executive vice president-finance. Mr. **Whittlen** has been with Trans Freight for the past six years, and was formerly vice president-accounting.

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At AOTOS Award presentation are (L to R): dinner chairman **Shannon J. Wall**, president of National Maritime Union of America, AFL-CIO; **Charles I. Hiltzheimer**, AOTOS general chairman and presenter of the award, former chairman of Sea-Land Industries Investments, Inc.; 1983 AOTOS recipient Rep. **Mario Biaggi** of New York; and Capt. **Robert J. Lowen**, president of the International Organization of Masters, Mates & Pilots, AFL-CIO, who served as chairman of the AOTOS National Committee comprised of maritime leaders in industry, labor, and government.

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Johan Robert Stenius

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Mr. Stenius joined Wartsila Turku in 1965. He has served as head of the Outfitting Department of the Drawing Office as well as head of the Perno Shipyard. Prior to his recent appointment he was director of the Diesel Works at the Turku Shipyard.

## Crane Packing Offers Brochure On New Metal Bellows Pump Shaft Seal

A new metal bellows shaft seal, specifically designed and engineered for use with ANSI pumps, is now available from Crane Packing of Morton Grove, Ill. Designated the John Crane Type 215, it features a shorter, more compact design and all-Hastelloy™ C construction that provides maximum corrosion resistance.

Literature offered by Crane describes the seal as suited to a broad range of process, petrochemical, and refinery applications. The 215 provides built-in hydraulic balance, insuring use throughout the full pressure range of ANSI pumps. It can also be used for outside mounting with internal pressure.

The Type 215 seal is available in sizes from 1 inch to 3 inches, covering all ANSI pump requirements. Standard O-rings allow temperature ranges up to 400 F (240 C); higher temperatures can be attained with optional materials.

For a free brochure on the John Crane Type 215 seal,

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## Novel Haggglunds Cranes Retrofitted On Cargo Ship Built In Shanghai

The novel Haggglunds "Excenter-mounted" cranes fitted recently at Cityvarvet, Gothenburg, to the cargoship Skagern add considerable extra interest to this new vessel. The two cranes, each of 25-ton capacity are of Haggglunds' standard electro-hydraulic type, but

mounted on platforms of a new type allowing eccentric positioning of the crane housing at any of four positions, offset at 2.5 meter radius from the center of the crane base.

As the crane bases are located close to the ship's port rail, it is possible to position the cranes outboard of the hull, with corresponding shorter working radius. Alternatively, the cranes may be located with their slewing center inboard,

over the hatch. This not only gives improved visibility but also better access to the far side of the hatch or over the ship's other side, without extreme jib radius.

The 106-meter Skagern is one of a series of 340 TEU vessels ordered by Schulz & Clemmensen, Hamburg, at the Zhonghua Shipyard in Shanghai. She was taken over by Ahlmarks Rederi, Karlstad, Sweden, immediately after delivery, and Cityvarvet has car-

ried out the necessary modifications to suit her to the owners' forest products trade between Baltic and North Sea ports.

The new "Excenter-mounted" crane, which Haggglunds have developed in cooperation with the owners, will also be fitted to a sister to the Skagern as well as on two smaller vessels now under construction for Ahlmark's subsidiary in the Netherlands.

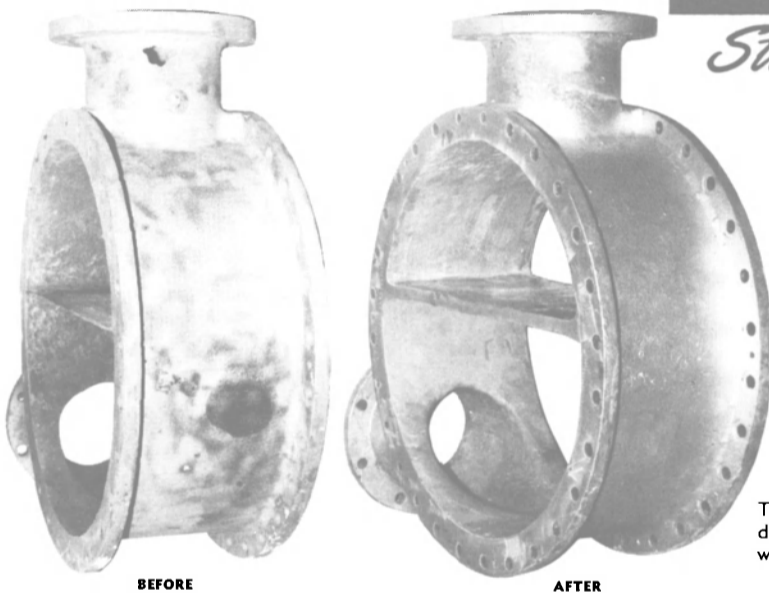
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| <b>Pipes</b>              | <b>Sea Valves and Chests</b>      |
| <b>Condenser Covers</b>   | <b>Tanks, Bulkheads and Decks</b> |
| <b>Cooler Heads</b>       | <b>Shell Plating Etc.</b>         |
| <b>Tail Shafts</b>        | <b>Frozen Pipes, etc.</b>         |

The Cordobond Strong-Back Components, when used according to directions, will repair anything from a pin hole to a complete break with a patch of great strength that clings tenaciously and lastingly.

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FRANCE—Dunkirk  
M & R Dekyispotter & Sons  
—Marseilles  
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GREECE—Piraeus  
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HOLLAND—Rotterdam  
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## IMO Expands Its Line Of Geared Twin-Screw Pumps —Literature Available

The IMO® Pump Division of Transamerica Delaval Inc. has broadened its line of GTS® geared twin-screw pumps to include models with cases, internals, and relief valves of stainless steel, Monel, bronze and NiResist, as well

as those with standard internals of cast iron and carbon steel.

The new pumps are expected to find wide use in loading and off-loading extremely sour crudes, pumping very high metals content residues from atmospheric and vacuum towers and dirty bottoms from other process units.

With a viscosity capability that goes as high as  $4.5 \times 10^6$  SSU, GTS

pumps can help refiners take the very deepest cuts of HGO and will handle pitch, asphalt, tars and other residues even when towers temporarily lose heat—doing away with the need for cutter fluids and hydroblasters. Units get back on stream quickly.

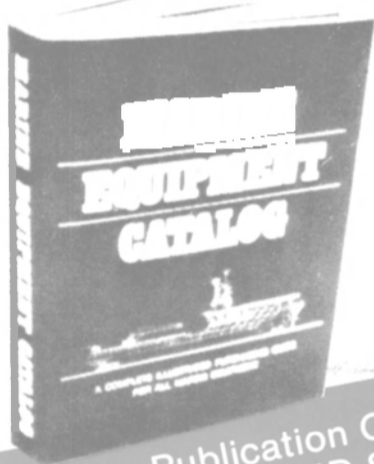
GTS pumps will tolerate even the dirtiest streams as bearings are isolated from the pumped fluid.

They can run dry without damage, retaining prime until feed is restored. Capacities run from 20–7,000 gpm, discharge pressures to 600 psig, and temperatures to 700 F.

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## National Maritime Show Moving To Houston

The 1984 National Maritime Show will be held at the Albert Thomas Convention Center in downtown Houston on April 25–27, 1984. The move to Texas will better serve the wide range of companies that cover the maritime industry, especially those located along the Gulf Coast.

Exhibitors will reach a broad market—tankers, bulkers and containerships; inland and offshore vessels; tugboats; dredges; drilling ships, jackups and semi-submersibles; workboats; Naval and Coast Guard vessels; and other specialty craft.

In addition to the exhibits, conference sessions will deal with the problems of ship construction, maintenance, and operation as well as port equipment and services. Cost for exhibit space is \$9.00 per square foot. For additional details contact Industrial Presentations, Inc., P.O. Box 721948, Houston, Texas 77272; telephone: 713-879-8929, telex 790-821 IND PRES.

## New Navidyne Option Reports Ship's Position In Response To Telex Call

A shipowner in the home office can obtain an up-to-the-minute report on a vessel's position, course, speed, and other vital information with the P-8030 Position Reporting Option recently introduced by Navidyne Corporation of Newport News, Va.

The P-8030 provides an interface between Navidyne's ESZ-8000 Satellite Communicator and the ship's satnav or Loran C. It can be added to an existing ESZ installation simply by inserting two printed circuit boards into empty slots in the ESZ-8000 electronics cabinet.

A shoreside caller can obtain a complete report with a simple telex message to the ship. Upon receipt of a coded command, the ESZ-8000 automatically returns a position report via telex. A private password must be entered by the caller, insuring protection against unauthorized calls.

For more information and technical literature on the P-8030 option,

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## Philadelphia Gear Licensed To Manufacture IHI's Duckpeller



Philadelphia Gear chairman **Russell C. Ball** (left) and ISC president **Tadeo Kanauchi** conclude execution of their licensing agreement with a handshake.

Philadelphia Gear Corporation, King of Prussia, Pa., recently concluded a licensing agreement with Ishikawajima Ship and Chemical Plant Company, Ltd. (ISC), a subsidiary of IHI, Tokyo. This agreement, reversing the normal flow of technology out of the U.S., affords Philadelphia Gear the opportunity to broaden its North American sales activities in high-technology marine propulsion with a service-proven system.

Under this agreement, ISC has granted Philadelphia Gear an exclusive license for the manufacture and sale of the Duckpeller 360-degree steering/propulsion system in the U.S. and Canada. The system, consisting of twin drive units complete with propellers, is currently available in five sizes ranging from 2,000 to 5,000 shp.

The features of the system may well revolutionize workboat propulsion in the U.S. Combining thrust and steering in a single package, it will lower construction, fuel, and maintenance costs, as well as simplify vessel operation.

The Duckpeller, with its unitized design, transmits the power of the main engine to the propeller via two bevel gear sets. The twin propeller systems, which are equipped with energy-efficient Kort nozzles, can be rotated through 360 degrees, effecting propeller thrust in any direction. This insures high maneuverability in all vessel motions, including on-the-spot turning, sideway movement, and rapid backing, without the necessity of a rudder. The Duckpeller is furnished with a single-lever, remote-control console, incorporating a micro-computer that automatically synchronizes the two propulsion units for movement in the desired direction.

The Duckpeller system has been used successfully and reliably overseas aboard more than 180 vessels, including tugboats, ferryboats, pusher boats, barges, work platforms, dredges, and floating cranes.

For more information and free literature on the Duckpeller,

Write 80 on Reader Service Card

## Epton Completes Order For Canada's Largest Marine Fenders

Epton Industries Inc. extruded a Canadian first recently with the completion of an order for 600-mm (24-inch) OD marine fenders, largest of their kind yet produced in Canada, according to the manufacturer. Destined for the Port of Vancouver on Canada's West

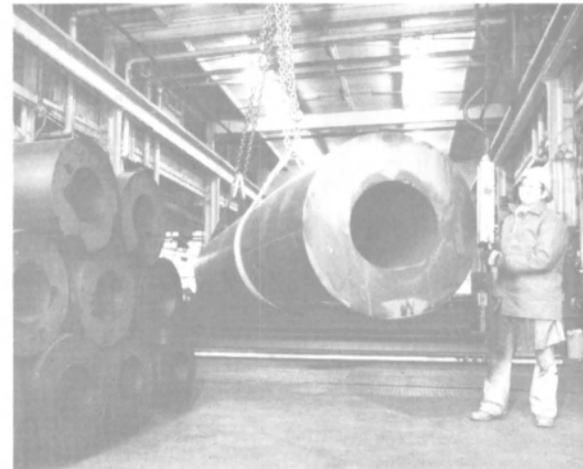
Coast, this extrusion cut into 46 3-meter (10-foot) lengths will prevent containerships as big as 54,000 displacement tons from damaging Vancouver terminal docks, and vice versa.

These fenders are by no means Epton's maximum capacity. **Doug Maass**, business manager for marine products, explains, "Our plant has the capability to produce up to 711-mm (28-inch) OD extruded, and as large as 2,540-mm (100-inch) OD hand-built cylindrical fenders."

Epton Industries was founded by a group of former BFGoodrich employees who have purchased and assumed the operation of BFG's Canadian Engineered Products Plant in Kitchener, Ontario.

For further information on Epton fenders,

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Epton crane operator **Jim Woods** oversees the loading of 1,700-pound section of fender for Port of Vancouver.

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Other publications: European Harbour Pilot, African Harbour Pilot, Loading Places for Oil Tankers in the World (new edition 1984).

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## Daewoo Delivers Second \$80-Million Pacesetter Rig To Santa Fe Drilling



Self-propelled, semi-submersible drilling rig built by Daewoo Shipbuilding for Santa Fe Drilling was delivered recently. Rig, a Friede and Goldman L-907 Pacesetter type, can drill to almost 25,000 feet.

Daewoo Shipbuilding and Heavy Machinery Ltd. in Korea recently delivered a second semi-submersible drilling rig to Santa Fe Drilling Company of Orange, Calif. Both rigs constructed for Santa Fe Drilling, a subsidiary of Santa Fe International Corporation, are self-propelled, Friede and Goldman L-907 Pacesetter types, with export prices of \$80 million each. These rigs are capable of drilling to a depth of 24,750 feet in up to 1,500 feet of water, and provide living quarters for 96 personnel.

Since opening two years ago, Daewoo's Okpo Shipyard has delivered eight drilling rigs of two types. In addition to the two built for Santa Fe, the Okpo yard has constructed two semi-submersibles for Reading and Bates Drilling Company of Houston, and one each for Houlder Offshore Drilling Company and Atlantic Drilling Company, both of the U.K.

A semi-submersible rig for Korea Drilling Company is now under construction at the Okpo Shipyard. With this rig's delivery in the spring of 1984, the drilling firm will be the first Korean company to own a drilling rig it operates. The rig will be used to explore Korea's continental shelf and other national coastlines.

Also under construction at Okpo are 12 containerships for U.S. Lines, chemical tankers for Stolt-Nielsen of Norway, bulk carriers for Malaysia, and gas-compression platforms for Kuwait and Saudi Arabia.

## Blount Marine Launches Another Mini-Cruise Liner Built For American Canadian Line

Blount Marine Corporation of Warren, R.I., recently launched the 165-foot, 80-passenger mini-cruise ship Caribbean Prince. Christened by **John Gentles**, director of tourism for Jamaica, and constructed for American Canadian Line, Inc., the new vessel will commence its Caribbean operations in January 1984 with a series of eight, 12-day "Circle 'Round Jamaica" cruises. The summer season will be spent cruising on the Great Lakes.

The Caribbean Prince is air conditioned and equipped with a retractable pilothouse for negotiating the low bridges of the New York



Jamaican director of tourism **John Gentles** breaks the champagne at recent christening and launch of the 80-passenger mini-cruise vessel Caribbean Prince that is building at Blount Marine yard for American Canadian Line.

Canal System. The Prince is a bigger sister ship of the New Shoreham II, which is operated in the Bahamas by American Canadian Line.

The accompanying launching photo shows the novel combination bulbous bow/bow thruster designed by **Luther Blount**, president of Blount Marine.

## WESMAR Presents Stability Computer To 'President Lincoln'—Literature Available



WESMAR marketing manager, **Tom Casey**, presents **Pieter Boele**, master of the "President Lincoln" with the company's first stability computer.

Western Marine Electronics (WESMAR) of Seattle recently presented the company's first SC44 stability computer and printer to the 860-foot containership President Lincoln. The presentation was in acknowledgement of American President Lines' cooperation in testing the new device.

The small computer, roughly the size of a cigar box, constantly monitors the stability of a vessel while loading and while at sea, providing visual as well as audible warning when stability declines. A digital readout displays GM, (the number in feet between the center of gravity and the point at which the vessel loses stability). Changes in the center of gravity can be caused by several factors: overloading, the movement of fluids in holding tanks, icing, vessel speed, and wave conditions.

Testing of the SC44 with APL consisted of two separate voyages, aboard the President Lincoln and the 788-foot President Grant. The President Lincoln is the United States' largest containership with a capacity of 1,250 forty-foot containers. According to **Dan Rothenbuhler**, WESMAR's chief engineer, the results of the tests were impressive. "Our Stability Computer measured virtually the same GM as their expensive computer system; the difference was insignificant. The SC44 met and surpassed our objectives by displaying extremely accurate GM readouts."

For more information on the SC44,  
 Write 79 on Reader Service Card

## McDermott Shipyards To Build Inter-Island Barge For Matson

McDermott Shipyards has been awarded a contract by Matson Navigation Company of San Francisco to build a unique, 350-foot self-unloading container/tank barge. It will be used for Matson's inter-island cargo services in the Hawaiian Islands, and will be named Haleakala for the famous mountain on Maui.

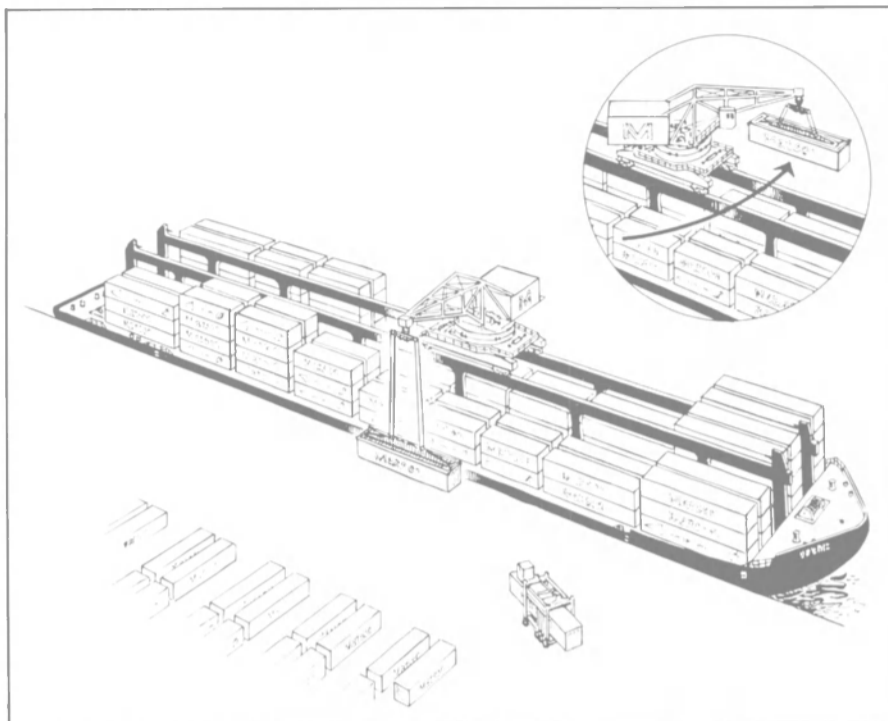
The vessel will have a beam of 64 feet, depth of 21 feet 3 inches, and tank capacity for 1,700 long tons of molasses. Its deck will accommodate 216 standard freight containers of various sizes, including dry cargo and refrigerated boxes, and auto frames.

Features of the barge will include movable cell guides to secure containers on deck, an on-board revolving crane that will keep containers parallel with the barge during loading and unload-

ing, and a radio-controlled stern thruster to assist in docking operations. The vessel will be towed by a tugboat and used for transshipping Pacific Coast-Hawaii cargo between Honolulu and the islands of Hawaii, Maui, and Kauai.

The big barge will be constructed in three sections at each of McDermott's shipyards. The bow section will be built in New Iberia, La.; the stern section with machinery in Morgan City, La.; and the midbody in Gulfport, Miss. Final assembly will take place at the Morgan City yard, with completion scheduled for August 1984.

The McDermott shipyards specialize in the construction and repair of large tugs, supply boats, barges, drill rigs, living quarters, and a wide variety of oceangoing work vessels.



Artist's rendering of container/tank barge ordered from McDermott Shipyards by Matson. The 350-foot vessel will have an on-board crane and radio-controlled stern thruster.



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Interested persons should submit a resume to Dr. Roger H. Compton, Director of Naval Architecture, Naval Systems Engineering Department, United States Naval Academy, Annapolis, Maryland 21402. The U.S. Naval Academy is an equal opportunity/affirmative action employer.

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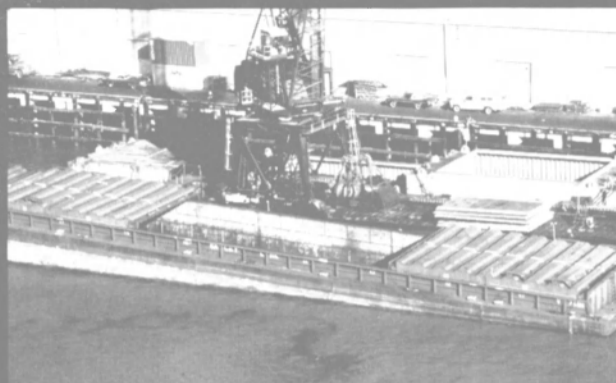
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Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121  
Northern Marine, P.O. Box 1169, Traverse City, MI 49685  
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114  
Offshore Power Systems, 8000 Arlington Expressway, Jacksonville, FL 32211  
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117  
Pearson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156  
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317  
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Rothfuss Engineering Corp., P.O. Box 97, Columbia, MD 21045  
Schmah and Schmah, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316  
SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)  
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202  
Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426  
Seaworthy Engine Systems, 17 Battery Place, New York, NY 10004  
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007  
Simmons Associates, P.O. Box 760, Sarasota, FL 33578  
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235  
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Timsco, 622 Azalea Road, Mobile, AL 36609  
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Uhlig & Associates, Inc., 8295 SW 188th St., Miami, FL 33157  
VeVeY Engineering Works Ltd. U.S. Rep. Carl G. Brimmekamp & Co., Inc., 102 Hamilton Ave., Stamford, CT 06902  
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Yacht Design Institute, 9 Main St., Blue Hill, ME 04614

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Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080  
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Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201  
EPSCO Marine, 550 Wholesalers Parkway, Harahan, LA 70123  
Fleet Marine, 1820 N.E. 146th Street, North Miami, FL 33181  
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080  
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610  
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631  
Japan Radio Co., Ltd., Akasaka Twin Tower (Main), 17-22 Akasaka 2-chome, Minato-ku, Tokyo 107, Japan  
King Radio Corporation, 400 North Rodgers Rd., Olathe, KS 66062  
Kongsberg North America Inc., 135 Fort Lee Road, Leonia, NJ 07605  
Kongsberg Vapenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway  
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065  
Lorain Electronics Corp., 2307 Leavitt Rd., Lorain, OH 44052  
Magnavox Navigation Systems, 2829 Maricopa Street, Torrance, CA 90503  
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Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067

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Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601  
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Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989  
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Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307  
Fram Industrial, P.O. Box 33210, Tulsa, OK 74135  
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696  
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Devco Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207  
E.I. Dupont de Nemours & Co., Inc., Nemours Bldg. Rm. N-2504-2, Wilmington, DE 19898  
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Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080  
Grow Group, Inc., 200 Park Ave., New York, NY 10017  
Hempel Marine Paints, Inc., 65 Broadway, New York, NY 10006, 2425 Fountainview, Suite 340, Houston, TX 77057, P.O. Box 10265, New Orleans, LA 70181  
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083  
Jaegle Paint Co., Inc., 1912 Darby Rd., Havertown, PA 19083  
Jolon-Baltimore Copper Paint Co., 840 Key Highway, Baltimore, MD 21230  
Magnum Maritex International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650  
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250,

Edison, N.J. 08817  
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490  
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203  
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Metropolitan Plumbing Supply Corp., 5000 Second St., Long Island City, NY 11101  
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002  
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Stauff Corporation, 21-31 Industrial Park, Waldwick, NJ 07463

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Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
Bombardier, 1051 Dickson, Montreal, Quebec, Canada H1N 2H7  
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark  
Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629  
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511  
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520  
Combustion Engineering, Inc., Windsor, Connecticut 06095  
Daihatsu Diesel (USA) Inc., 1211 Ave. of the Americas, New York, NY 10036  
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340  
Diesel Marine International, Ltd., c/o NORSHIPCO, P.O. Box 2100, Norfolk, VA 23501  
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Escher Wyss GmbH, (Member Sulzer Group), Ravensburg, Germany  
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General Motors, Electro-Motive Division, LaGrange, IL 60525  
George Engine Company, Inc., Lafayette, LA  
Gollen Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231  
Harbormaster, 36 Hancock St., Quincy, MA 02171  
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025  
Lips Propellers, 3617 Koppings Way, Chesapeake, VA 23323  
M.A.N.-B&W Diesel, 2, Ostervej, DK-4960 Høleby, Denmark  
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209  
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046  
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Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032  
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Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166  
Karl Senner, Inc., P.O. Box 10055, New Orleans, LA 70181  
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512  
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland  
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621  
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650  
Turbine Specialties, Inc., P.O. Box 207, West State Street Road, Salina, KS 67401  
Turbine Specialties/Gulf Coast, Inc., 1900 Industrial Blvd., Harvey, LA 70058  
Voith Schneider America, 159 Great Neck Rd., Ste 200, Great Neck, NY 11021  
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Warsila Power Inc., 5132 Torovella Rd., P.O. Box 868, Marrero, LA 70072  
Waukesha Engine Division, Waukesha, WI 53187  
Welco Industries, Inc., 9027 Shell Rd., Cincinnati, OH 45236  
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Transamerica Delaval, IMO Pump Division, P.O. Box 447, Monroe, NC 28110  
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Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470  
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Marine Drive Systems, 519 Raritan Center, Edison, NJ 08817  
Robertson, 135 Fort Lee Rd., Leonia, NJ 07605

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Wormold Fire Systems, One Stanton St., Marinette, WI 54143

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Argo Marine, 140 Franklin St., New York, NY 10013  
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111  
Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, N.Y. 11696  
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

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Patent Scaffolding Co., One Bridge Plaza, Fort Lee, NJ 07024  
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Crane Packing Company, 435 Regina Dr., Clarksburg, MD 20734

EG&G Sealol, Engineered Products Div., Marine Products Group, Warwick, RI 02888  
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002

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Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217  
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Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018  
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Welded Beam Company, P.O. Box 280, Perry OH 44081

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Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland  
Asmar Shipyards Co., Astilleros y Maestranzas de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.  
Astilleros Balboa, S.A., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004  
Ateliers et Chantiers de Bretagne—ACB, 44040 Nantes Cedex, France  
Atlantic Dry Dock, P.O. Box 276, Ft. George Island, Jacksonville, FL 32226  
Atlantic Marine Inc., P.O. Box 138, Ft. George Island, Jacksonville, FL 32226  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530  
Bay Shipbuilding Corp., 605 North 3rd Ave., Sturgeon Bay, WI 54235  
BFC Marine Services, Inc., 25 Fifth St., Brooklyn, NY 11231  
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601  
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018  
Blom & Voss Company, 55 Morris Avenue, Springfield, NJ 07081  
Burmeister & Wain Skipsvaerft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark  
Burrard Yarrow's Corporation, P.O. Box 86099, North Vancouver, B.C., Canada  
Caneco Shipyard, Rua Carlos Seidl, 714, Caju, 20.931, Rio de Janeiro, RJ, Brazil  
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy  
Carrington Slipways Pty. Ltd., Old Punt Rd., Tomago NSW Australia 2322  
China Shipbuilding Corp., 3 Chung Kang Rd., Hsia Kang, Kaohsiung, Taiwan, Republic of China  
Conrad Industries, P.O. Box 790, Morgan City, La. 70380  
Cunacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10004  
Daewoo International (America) Corp., 437 Madison Ave., New York, NY 10022  
Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Changsung-PO, Koje-Kun, Kyungnam, Korea  
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa  
Dravo Marine Equipment Company, Neville Island, Pittsburgh, PA 15225  
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401  
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208  
Far East Livingston Shipbuilding Ltd., 31 Shipyard Rd., Jurong Town, Singapore 2262  
Genstar Marine, 10 Pemberton Ave., No. Vancouver, B.C., Canada V7P 2R1  
Gladding-Hearn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725  
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219  
Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189  
Hoboken Shipyards, Inc., 1301 Hudson St., Hoboken, NJ 07030  
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong  
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea  
I.N.M.A. S.p.A., 19100 La Spezia, v.le S. Bartolomeo 362, Italy  
Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771  
Jeffboat, Inc., Jeffersonville, Ind. 47130  
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409  
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094  
Kone Corp., P.O. Box 6, SF-05801, Hyvinkaa, Finland  
Leevac Corporation, P.O. Box 2607, Morgan City, LA 70381  
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134  
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany  
McDermott, Incorporated, 1010 Common Street, New Orleans, LA 77227  
Main Iron Works, Inc. P.O. Box 1918, Houma, LA 70361  
Marinette Marine Corporation, Marinette, WI 54143  
Marystown Shipyard Limited, P.O. Box 262, Marystown, Newfoundland, Canada AOE 2M0  
Jos. L. Meyer GmbH & Co., P.O. Box 2990 Papenburg 1, West Germany  
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681  
Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Tokyo, 100 Japan  
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655  
Moran Shipping Agencies, 10 Jefferson Blvd., Warwick, RI 02888  
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552  
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202  
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048  
National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607  
North Florida Shipyards, P.O. Box 3863, Jacksonville, FL 32206  
O.A.R.N. (Officine Allestimento-Riprazioni Navali), P.O. Box 1395, Genoa, Italy 16100  
Overseas Shipyards, Inc., 21 West St., New York, NY 10006  
Pati Industries Inc., South B St., Pensacola, FL 32573  
Progressive Shipbuilders & Fabricators, Inc., P.O. Box 9130, Houma, LA 70361  
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22  
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02906  
Puerto Rico Drydock & Marine Terminals, Inc., P.O. Box 2209, San Juan, Puerto Rico 00903  
Rauma-Repola, 26100 Rauma 10, Finland  
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taeyong-ro, Chung-ku, Seoul, Korea  
Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402  
Schuess Defries, Postfach 111146, Schuess-Str. 61, D-4000 Dusseldorf 11, West Germany  
Service Machine Group, Inc., P.O. Box 2664, Morgan City, LA 70381  
Southbay Boat Inc., P.O. Box 13308, San Diego, CA 92113  
Southern Oregon Marine Engineering and Construction, P.O. Box 1220, Coos Bay, OR 97420  
Southwest Marine, Inc., P.O. Box 13308, San Diego, Co 92113  
Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380  
Thomas Marine, 37 Bransford St., Patchogue, NY 11772  
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004  
Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316  
Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087  
Verolme Estaleiros Reunidos Do Brasil S.A., Rua Buenos Aires, 68, Rio de Janeiro—RJ—Brazil  
Vickers Cockatoo Dockyard Pty. Ltd., P.O. Box 162 Milsons Point, N.S.W. 2061, Australia  
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

# BUYERS DIRECTORY

(continued)

## SHIPPING—PACKING

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

## SILENCERS

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

## SMOKE INDICATORS

Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

## STUFFING BOXES

Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

Smith-Meeker Engineering Co., 157 Chambers Street, New York, NY 10007

## SURVEYORS AND CONSULTANTS

Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903

Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073

M.A. Stream Associates, Inc., 400 Second Ave. W., Seattle, WA 98119

## TANK CLEANING

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

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

Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002

## TANK LEVELING INDICATORS

ARMTEC Industries, Inc., Manchester, NJ 03103

Kockumation AB, Box 1044, S-212 10 Malmö, Sweden

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

Norcontrol, 135 Fort Lee Rd., Leonia, NJ 07605

Salwico Inc., 5 Marine View Plaza, Hoboken, NJ 07030

Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

## TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.

Atlantic Towing Ltd., 300 Union Pl., St. John, N.B., Canada E2L 1B6

Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002

Bulkfleet Marine Corporation, 1800 West Loop So., Houston TX 77027

Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202

Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771

James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004

International Transport Contractors Holland B.V., 5 Kenaupark, P.O. Box 21, Haarlem, Holland

McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

McDonough Marine Service, P.O. Box 26206, New Orleans, La

Midland Affiliated Co., 580 Walnut St., Cincinnati, OH 45201

Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048

National Marine Service, Transport Div., 1750 Brentwood Blvd., St. Louis, MO 63144

Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002

Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

## VALVES AND FITTINGS

Camlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696

Crow Corporation, 1211 West 22nd St., Oak Brook, IL 60521

The Crosby Group, Inc., P.O. Box 3128, Tulsa, OK 74101

Dover Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101

Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207

Jamesbury Corp., 640 Lincoln Street, Worcester, MA 01605

Marine Moisture Control Co., 60 Inip Dr., Inwood, N.Y. 11696

Metropolitan Plumbing Supply Corp., 50-09 Second Street, Long Island City, NY 11101

Newmans Inc., 9 Joanna Court, East Brunswick, NJ 08816

Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642

Stacey Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

Stockham Valves & Fittings, Box 10326, Birmingham, AL 35202

Tate Temco, Inc., 1941 Lansdowne Road, Baltimore, MD 21227

Union Flonetics, P.O. Box 459, Clinton, PA 15026

Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186

Westran Corporation, Valve Components Group, 4025 Remembrance Rd., N.W., Grand Rapids, MI 49504

William E. Williams Valve Corporation, 38-52 Review Avenue, Long Island City, NY 11101

Winef, Inc., 34655 Mills Road, North Ridgeville, OH 44039

Zidell Explorations, Inc. (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

## VIBRATION ANALYSIS

DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110

## WATER PURIFIERS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024

AquaGlobal, 50/60 Inip Dr., Inwood, NY 11696

Bull & Roberts, Inc., 785 Central Ave., Murray Hill, NJ 07974

Drew Chemical Corporation, One Drew Chemical Plaza, Boonton, NJ 07005

Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559

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

## WELDING

CRC Automatic Welding, P.O. Box 3227, Houston, TX 77253-3227

Metallizing Co. of America, Inc., 321 So. Hamilton, Sullivan, IL 61951

Oerlikon Welding Industries, Inc., P.O. Box 40964, Houston, TX 77240

## WINCHES AND FAIRLEADS

Braden Winch Co., 800 East Dallas, Broken Arrow, OK 74012

CONMACO, Inc., 820 Kansas Ave., P.O. Box 5097, Kansas City, KS 66119

Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434

Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134

McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, W. Biloxi, MS 39531

Reel-O-Matic Systems, Inc., 418 Hellam Street, Wrightsville, PA 17368

Smith Berger Marine Inc., 516 So. Chicago St., Seattle, WA 98108

Stanspec Corp., 13600 Deise Ave., Cleveland OH 44110

Superior-Lidgerwood-Mundy Corp., 1101 John Avenue, Superior, WI 54880

## WINDOWS

Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, N.Y. 10550

## WIRE AND CABLE

Anaconda Ericsson Inc., Continental Wire and Cable, P.O. Box 1863, York, PA 17405

Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076

Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008

Delco Wire & Cable, Inc., 257 Rittenhouse Circle, Keystone Industrial Park, Bristol, PA 19007

Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055

Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

Tri-Mark, Inc., 8585 Industry Park Drive, Piqua, OH 45356

## WIRE ROPE—Slings

AISCO, 60 Grant Ave., Carteret, NJ 07008

Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008

Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018

A.L. Don Company, Foot of Dock Street, Matawan, NJ 07747

I & I Sling Company, 2626 Market Street, Dept. D, Aston, PA 19014

## ZINC

The Platt Bros. & Co., Box 1030, Waterbury, CT 06721

Smith & McCracken, 153 Franklin St., New York, N.Y. 10012

## New Tunnel Thruster Model Introduced By Omnithruster



Omnithruster Inc. president **Charles M. Aker** shown with company's new model OJ-M450 thruster that was unveiled at this year's Inland Waterways Conference and Trade Show.

Omnithruster Inc. of Santa Fe Springs, Calif., has introduced a new Omnitunnel Jet Module™ designed specifically for workboats, fishing vessels, barges, and dredge applications. The new model OJ-M450 is aimed at the conventional thruster market, and is said to be competitive in price with fixed-pitch tunnel thrusters.

Omnithruster president **Charles M. Aker** states, "the new concept has many advantages, some of which are: the units can be mounted in the bow or stern for side thrusting, or can be mounted in any part of the vessel where thrust is required. No gearbox is used, which improves water flow efficiency; additionally, there is no chance of oil pollution as all submerged bearings are water-lubricated. On ships with a wide beam, there is no need for a long tunnel that increases weight, or reduces buoyancy, and decreases thrust by adding resistance."

The new unit has a self-contained hydraulic motor rated at 100 hp input, 85 shp. The net thrust, allowing for installation losses, is approximately 2,000 to 2,200 pounds. Each module (two are required for side thrusting) is 30 inches wide, 54 inches deep, and weighs 786 pounds. Built to meet American Bureau of Shipping and U.S. Coast Guard specifications, the new units can meet other classification society requirements as well.

The units are versatile and can be mounted in many different positions. For shallow-draft vessels they can be installed so that only 2 feet 9 inches draft are required for full thrust. This makes them adaptable to barges and other vessels in light-ship conditions. Units can be combined in groups for greater thrust, and controlled as a single system.

Omnithruster manufactures a complete line of hydrojet maneuvering and propulsion systems ranging from 50 to 3,000 hp in single units. The company was founded in 1976 by **Stanley A. Dashew**, chairman. Omnithruster systems are installed in ships worldwide, including U.S. Navy vessels, arctic icebreakers, barges, fishing vessels, geophysical craft, and large oil tankers.

✓ For more information and free literature on Omnithruster,

Write 78 on Reader Service Card

## Bell Aerospace Awarded Navy Contract For Final Phase Of Minesweeper Hunter Design



Artist's rendering of minesweeper hunter vessel that rides on a cushion of air. Bell Aerospace Textron is one of two companies participating in the final phase of the contract design and looks forward to participating in construction.

The U.S. Navy recently awarded a \$1-million contract to Bell Aerospace Textron of New Orleans, a division of Textron Inc., for the final phase of the contract design of a minesweeper hunter (MSH) that rides on a cushion of air. The award of this new MSH contract was announced by **John J. Kelly**, senior vice president and general manager of Bell Aerospace Textron, New Orleans Operation, and president of Bell Halter Inc.

On April 15 this year, Bell and three other companies received contracts for the initial contract design phase of the MSH program. Following Navy evaluation of the designs submitted by these companies, Bell received one of two contracts awarded for the second phase of the contract design. Upon completion of the contract design, Bell looks forward to participating in construction of the MSH vessel.

The MSH will be a new class of coastal minesweeper designed to insure that access to U.S. ports and coastal waterways can be maintained against a mine threat. The Bell design uses air cushion technology to isolate most of the hull from contact with the water surface. Compared with conventional minesweepers, the vessel will be less susceptible to underwater shock from mine explosions. The air cushion also reduces the underwater acoustic and pressure signatures of the vessel, making it less likely that today's sophisticated mines will be triggered before they can be detected and neutralized by the systems carried aboard the MSH. This concept offers a dramatic improvement, reducing the risk and cost of minesweeping.

Bell Halter Inc. is a company formed by Bell Aerospace Textron and Halter Marine, Inc. of New Orleans to construct air cushion vehicles and surface effect ships for military and commercial use. Halter Marine's minority interest in Bell Halter Inc. was recently acquired by Trinity Industries, Inc., when it purchased all of the outstanding stock of Halter Marine.



Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401  
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114  
Marine Design Inc., 401 Broad Hollow Road, Rt. 110, Melville, N.Y. 11764  
Marine Power Associates, 447 Mission Blvd., Suite 235, San Diego, CA 92109  
Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030  
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403  
Metrolape Inc., P.O. Box 2366, Littleton, MA 01460  
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003  
NKF Engineering Assoc., Inc., 8150 Leesburg Pike, Vienna, VA 22202  
Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169  
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121  
Northern Marine, P.O. Box 1169, Traverse City, MI 49685  
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114  
Offshore Power Systems, 8000 Arlington Expressway, Jacksonville, FL 32211  
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117  
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156  
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317  
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105  
Rothfuss Engineering Corp., P.O. Box 97, Columbia, MD 21045  
Schmohl and Schmohl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316  
SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)  
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202  
Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426  
Seaworthy Engine Systems, 17 Battery Place, New York, NY 10004  
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007  
Simmons Associates, P.O. Box 760, Sarasota, FL 33578  
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235  
Richard R. Taubler Inc., 8 Columbia St., Milford, Del. 19963  
Timisco, 622 Azalea Road, Mobile, AL 36609  
Tracor Hydraulics, Inc., 7210 Pindell School Rd., Laurel, MD 20707  
Uhlir & Associates, Inc., 8295 SW 188th St., Miami, FL 33157  
VeVeY Engineering Works Ltd. U.S. Rep: Carl G. Brimmekamp & Co., Inc., 102 Hamilton Ave., Stamford, CT 06902  
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744  
Yacht Design Institute, 9 Main St., Blue Hill, ME 04614

#### NAVIGATION & COMMUNICATIONS EQUIPMENT

Alden Electronics, 1145 Washington St., Westborough, MA 01581  
American Hydromath Co., Buckwheel Bridge Rd., Germantown, N.Y. 12526  
Anschutz & Co. GmbH, Postfach 6040, D-2300 Kiel 14, West Germany  
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080  
Cybernet International, Inc., 7 Powder Horn Dr., Warren, NJ 07060  
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway  
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201  
EPSCO Marine, 550 Wholesalers Parkway, Harahan, LA 70123  
Fleet Marine, 1820 N.E. 146th Street, North Miami, FL 33181  
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080  
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610  
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631  
Japan Radio Co., Ltd., Akasaka Twin Tower (Main), 17-22 Akasaka 2-chome, Minato-ku, Tokyo 107, Japan  
King Radio Corporation, 400 North Rodgers Rd., Olathe, KS 66062  
Kongsberg North America Inc., 135 Fort Lee Road, Leonia, NJ 07605  
Kongsberg Vapenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway  
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065  
Lorain Electronics Corp., 2307 Leavitt Rd., Lorain, OH 44052  
Magnavox Navigation Systems, 2829 Maricopa Street, Torrance, CA 90503  
Nav-Cam, Inc., 9 Brandywine Drive, Deer Park, NY 11729  
Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23606  
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164  
Racal-Decca Marine, Inc., 4200 23rd Avenue West, Seattle, WA 98199  
Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577  
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033  
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103  
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914  
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061  
Rivertronics, P.O. Box 247, Godfrey, IL 62035  
Robertson Auto Pilot, 135 Fort Lee Road, Leonia, NJ 07605  
Selesmar S.p.A., Casella Postale 9, 50020 Montagnana Val Di Peso, Firenze, Italy  
Servo Corporation of America, 111 New South Road, Hicksville, NY 11802  
Simrad, Inc., 2215 NW Market St., Seattle, WA 98107  
Sperry Corporation, Great Neck, NY 11020  
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009  
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067

#### OILS—Marine—Additives

Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001  
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601  
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022  
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017  
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

#### OIL/WATER SEPARATORS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024  
Biospherics Incorporated, 5001 Forbes Blvd., Lanham, MD 20801  
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77233-9989  
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England  
Centric, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647  
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307  
Fram Industrial, P.O. Box 33210, Tulsa, OK 74135  
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696  
National Fluid Separators, Inc., 1239 Hanley Industrial Court, St. Louis, MO 63144  
Phoenix Oil Refiner Co., Inc., 330 Hill Ave., Nashville, TN 37210

#### PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111  
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754  
Argo Marine, 140 Franklin St., New York, NY 10013  
Bareco, 6910 East 14th St., Tulsa, OK 74112  
CLEMCO, P.O. Box 7680, San Francisco, CA 94120  
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklinton Rd., Baltimore, MD 21223  
Devco Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207  
E.I. Dupont De Nemours & Co., Inc., Nemours Bldg. Rm. N-2504-2, Wilmington, DE 19898  
Esgard, Box 2698, Lafayette, LA 70502  
Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080  
Grow Group, Inc., 200 Park Ave., New York, NY 10017  
Hempel Marine Paints, Inc., 65 Broadway, New York, NY 10006, 2425 Fountainview, Suite 340, Houston, TX 77057, P.O. Box 10265, New Orleans, LA 70181  
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083  
Jaegle Paint Co., Inc., 1912 Darby Rd., Havertown, PA 19083  
Jotun-Baltimore Copper Paint Co., 840 Key Highway, Baltimore, MD 21230  
Magnus Maritex International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650  
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250,

Edison, N.J. 08817  
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490  
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203  
Salwico Glassflake, Inc., 5 Marine View Plaza, Hoboken, NJ 07030  
Seaguard, 4030 Seaguard Ave., Portsmouth, VA 23705  
Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143  
Sermetel, Inc., 4401 Sermetel Dr., Moss Point, MS 39563  
Teledyne Metal Finishers, 1725 East 27th St., Cleveland, OH 44114

#### PETROLEUM SUPPLIES

Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

#### PIER REPAIRS

Acquatic Marine Systems, Inc., P.O. Box 326, Williamsville, NY 14221

#### PIPE-HOSE—Cargo Transfer, Clamps, Couplings, Coatings

Comlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696  
Hydro-Craft, Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063  
Knights Piping Inc., 5309 Industrial Rd., Pascagoula, MS 39567  
Kubota Ltd., 2-47, Shikit Suhigashi 1-Chome, Naniwa-Ku, Osaka 556-91, Japan  
Metropolitan Plumbing Supply Corp., 5000 Second St., Long Island City, NY 11101  
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002  
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419  
Stauff Corporation, 21-31 Industrial Park, Waldwick, NJ 07463

#### PLASTICS—Marine Applications

Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

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

American Lohmann Corp., 1415 Chestnut Ave., Hillside, NJ 07205  
Armo Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
Bombardier, 1051 Dickson, Montreal, Quebec, Canada H1N 2H7  
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark  
Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629  
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511  
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520  
Combustion Engineering, Inc., Windsor, Connecticut 06095  
Daihatsu Diesel (USA) Inc., 1211 Ave. of the Americas, New York, NY 10036  
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340  
Diesel Marine International, Ltd., c/o NORSHIPCO, P.O. Box 2100, Norfolk, VA 23501  
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505  
Escher Wyss GmbH, (Member Sulzer Group), Ravensburg, Germany  
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531  
General Motors, Electro-Motive Division, LaGrange, IL 60525  
George Engine Company, Inc., Lafayette, LA  
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231  
Harbormaster, 36 Hancock St., Quincy, MA 02171  
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025  
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323  
M.A.N.-B&W Diesel, 2, Ostervej, DK-4960 Høleby, Denmark  
MTU of North America, One E. Pulnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209  
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046  
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007  
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507  
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037  
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670  
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054  
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032  
SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France  
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166  
Karl Senner, Inc., P.O. Box 10055, New Orleans, LA 70181  
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512  
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland  
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621  
Transamerica DeLaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650  
Turbine Specialties, Inc., P.O. Box 207, West State Street Road, Salina, KS 67401  
Turbine Specialties/Gulf Coast, Inc., 1900 Industrial Blvd., Harvey, LA 70058  
Voith Schneider America, 159 Great Neck Rd., Ste 200, Great Neck, NY 11021  
WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505  
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072  
Waukesha Engine Division, Waukesha, WI 53187  
Welco Industries, Inc., 9027 Shell Rd., Cincinnati, OH 45236  
ZF of North America, Inc., 3225 Commercial Avenue, Northbrook, IL 60062  
ZF of North America, Inc. (Motive Power Corporation, P.O. Box 365, Mineola, NY 11501)

#### PUMPS—Repairs—Drives

Argo Marine, 140 Franklin St., New York, NY 10013  
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101  
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15228  
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002  
Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030  
Transamerica DeLaval, IMO Pump Division, P.O. Box 447, Monroe, NC 28110  
Vita Motivator Company, 200 West 20th St., New York, NY 10011  
Warren Pumps Division, Bridges Avenue, Warren, MA 01083  
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

#### REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
Port Refrigeration Div., 157 Perry St., New York, NY 10014

#### ROLLING SYSTEMS

Hilman, Inc., 2604 Atlantic Ave., Wall (Belmar), NJ 07719

#### ROPE—Manila—Nylon—Hawsers—Fibers

American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431  
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008  
DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898  
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470  
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110  
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666  
Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621

#### RUDDER ANGLE INDICATORS—STEERING

Hy-Drive America Corp., 3629 Vernon Blvd., Long Island City, NY 11106  
Marine Drive Systems, 519 Raritan Center, Edison, NJ 08817  
Robertson, 135 Fort Lee Rd., Leonia, NJ 07605

#### SAFETY EQUIPMENT

Elkhart Brass Manufacturing Co., Inc., P.O. Box 1127, Elkhart, IN 46515  
Wormald Fire Systems, One Stanton St., Marinette, WI 54143

#### SANITATION DEVICES—Pollution Control

Argo Marine, 140 Franklin St., New York, NY 10013  
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111  
Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., N.Y. 11696  
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

#### SCAFFOLDING EQUIPMENT—Work Platforms

McCauley Lumber Co., 7751 Lyndon, Detroit, MI 48238  
Patent Scaffolding Co., One Bridge Plaza, Fort Lee, NJ 07024  
Trus-Joist Corp., P.O. Box 60 Boise, ID 83704

#### SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081  
Crane Packing Company, 435 Regina Dr., Clarksburg, MD 20734

EG&G Sealol, Engineered Products Div., Marine Products Group, Warwick, RI 02888  
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002

#### SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202  
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217  
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

#### SHIPBUILDING EQUIPMENT

Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156  
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606  
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 28, N5201, Oslo, Norway

#### SHIPBUILDING STEEL

Armo Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018  
Tiline, P.O. Box 729, Albany OR 97321  
Welded Beam Company, P.O. Box 280, Perry OH 44081

#### SHIPBUILDING—Repairs, Maintenance, Drydocking

Alabama Maritime Corp., P.O. Box 3026, Mobile, AL 36652  
Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland  
Asmar Shipyards Co., Astilleros y Maestranzas de la Armada, Prat 856, Piso 14, Casilla 150-V, Valparaiso, Chile, S.A.  
Astilleros Balboa, S.A., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004  
Ateliers et Chantiers de Bretagne—ACB, 44040 Nantes Cedex, France  
Atlantic Dry Dock, P.O. Box 276, Ft. George Island, Jacksonville, FL 32226  
Atlantic Marine Inc., P.O. Box 138, Ft. George Island, Jacksonville, FL 32226  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530  
Bay Shipbuilding Corp., 605 North 3rd Ave., Sturgeon Bay, WI 54235  
BFC Marine Services, Inc., 25 Fifth St., Brooklyn, NY 11231  
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601  
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018  
Blom & Voss Company, 55 Morris Avenue, Springfield, NJ 07081  
Burmeister & Wain Skibsverft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark  
Burrard Yarrow Corporation, P.O. Box 86099, North Vancouver, B.C., Canada  
Caneco Shipyard, Rua Carlos Seidl, 714, Caju, 20.931, Rio de Janeiro, RJ, Brazil  
Cantiere Navale Riuniti, Via Cipro, 11, 16100 Genova, Italy  
Carrington Shipways Pty. Ltd., Old Punt Rd., Tomago NSW Australia 2322  
China Shipbuilding Corp., 3 Chung Kang Rd., Hsia Kang, Kaohsiung, Taiwan, Republic of China  
Conrad Industries, P.O. Box 790, Morgan City, La. 70380  
Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10004  
Daewoo International (America) Corp., 437 Madison Ave., New York, NY 10022  
Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Changung-PO, Kaie-Kun, Kyungnam, Korea  
Darby Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa  
Dravo Marine Equipment Company, Neville Island, Pittsburgh, PA 15225  
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401  
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208  
For East Livingston Shipbuilding Ltd., 31 Shipyards Rd., Jurong Town, Singapore 2262  
Genstar Marine, 10 Pemberton Ave., No. Vancouver, B.C., Canada V7P 2R1  
Gladding-Hearn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725  
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219  
Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189  
Hoboken Shipyards, Inc., 1301 Hudson St., Hoboken, NJ 07030  
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong  
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dang, Ulsan, Korea  
I.N.M.A. S.p.A., 19100 La Spezia, v. le S. Bartolomeo 362, Italy  
Jacobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771  
Jeffboat, Inc., Jeffersonville, Ind. 47130  
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409  
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094  
Kone Corp., P.O. Box 6, SF-05801, Hyvinkaa, Finland  
Leevac Corporation, P.O. Box 2607, Morgan City, LA 70381  
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134  
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany  
McDermott, Incorporated, 1010 Common Street, New Orleans, LA 77227  
Main Iron Works, Inc. P.O. Box 1918, Houma, LA 70361  
Marinette Marine Corporation, Marinette, WI 54143  
Marystown Shipyard Limited, P.O. Box 262, Marystown, Newfoundland, Canada AOE 2MO  
Jos. L. Meyer GmbH & Co., P.O. Box 2990 Pappenburg 1, West Germany  
Misenor Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681  
Mitsubishi Heavy Industries, Ltd., 5-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 100 Japan  
Monark Boot Co., P.O. Box 210, Monticello, Ark. 71655  
Moran Shipping Agencies, 10 Jefferson Blvd., Warwick, RI 02888  
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552  
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202  
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048  
National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607  
North Florida Shipyards, P.O. Box 3863, Jacksonville, FL 32206  
O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 1395, Genoa, Italy 16100  
Overseas Shipyards, Inc., 21 West St., New York, NY 10006  
Pattil Industries Inc., South B St., Pensacola, FL 32573  
Progressive Shipbuilders & Fabricators, Inc., P.O. Box 9130, Houma, LA 70361  
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22  
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02906  
Puerto Rico Drydock & Marine Terminals, Inc., P.O. Box 2209, San Juan, Puerto Rico 00903  
Rauma-Repola, 26100 Rauma 10, Finland  
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2ka, Taepyong-ro, Chung-ku, Seoul, Korea  
Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402  
Schiesse Defries, Postfach 111146, Schiess-Str. 61, D-4000 Dusseldorf 11, West Germany  
Service Machine Group, Inc., P.O. Box 2664, Morgan City, LA 70381  
Southbay Boat Inc., P.O. Box 13308, San Diego, CA 92113  
Southern Oregon Marine Engineering and Construction, P.O. Box 1220, Coos Bay, OR 97420  
Southwest Marine, Inc., P.O. Box 13308, San Diego, Ca 92113  
Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380  
Thomas Marine, 37 Bransford St., Patchogue, NY 11772  
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004  
Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316  
Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087  
Verolme Estaleiros Reunidos Do Brasil S.A., Rua Buenos Aires, 68, Rio de Janeiro—RJ—Brazil  
Vickers Cockatoo Dockyard Pty. Ltd., P.O. Box 162 Milsons Point, N.S.W. 2061, Australia  
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

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## SMOKE INDICATORS

Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

## STUFFING BOXES

Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

Smith-Meeker Engineering Co., 157 Chambers Street, New York, NY 10007

## SURVEYORS AND CONSULTANTS

Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903

Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073

M.A. Stream Associates, Inc., 400 Second Ave. W., Seattle, WA 98119

## TANK CLEANING

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

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

Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002

## TANK LEVELING INDICATORS

ARMEC Industries, Inc., Manchester, NJ 03103

Kockumation AB, Box 1044, S-212 10 Malmo, Sweden

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

Norcontrol, 135 Fort Lee Rd., Leonia, NJ 07605

Salwico Inc., 5 Marine View Plaza, Hoboken, NJ 07030

Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

## TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.

Atlantic Towing Ltd., 300 Union Pl., St. John, N.B., Canada E2L 1B6

Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002

Bulkfleet Marine Corporation, 1800 West Loop So., Houston TX 77027

Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202

Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771

James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004

International Transport Contractors Holland B.V., 5 Kenaupark, P.O. Box 21, Haarlem, Holland

McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

McDonough Marine Service, P.O. Box 26206, New Orleans, La

Midland Affiliated Co., 580 Walnut St., Cincinnati, OH 45201

Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048

National Marine Service, Transport Div., 1750 Brentwood Blvd., St. Louis, MO 63144

Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002

Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

## VALVES AND FITTINGS

Camlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696

Crow Corporation, 1211 West 22nd St., Oak Brook, IL 60521

The Crosby Group, Inc., P.O. Box 3128, Tulsa, OK 74101

Dover Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101

Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207

Jamesbury Corp., 640 Lincoln Street, Worcester, MA 01605

Marine Moisture Control Co., 60 Inip Dr., Inwood, N.Y. 11696

Metropolitan Plumbing Supply Corp., 50-09 Second Street, Long Island City, NY 11101

Newmans Inc., 9 Joanna Court, East Brunswick, NJ 08816

Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642

Stacey Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

Stockham Valves & Fittings, Box 10326, Birmingham, AL 35202

Tate Temco, Inc., 1941 Lansdowne Road, Baltimore, MD 21227

Union Flonetics, P.O. Box 459, Clinton, PA 15026

Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186

Westran Corporation, Valve Components Group, 4025 Remembrance Rd., N.W., Grand Rapids, MI 49504

William E. Williams Valve Corporation, 38-52 Review Avenue, Long Island City, NY 11101

Wine, Inc., 34655 Mills Road, North Ridgeville, OH 44039

Zidell Explorations, Inc., (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

## VIBRATION ANALYSIS

DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110

## WATER PURIFIERS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024

AquaGlobal, 50/60 Inip Dr., Inwood, NY 11696

Bull & Roberts, Inc., 785 Central Ave., Murray Hill, NJ 07974

Drew Chemical Corporation, One Drew Chemical Plaza, Boonton, NJ 07005

Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559

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

## WELDING

CRC Automatic Welding, P.O. Box 3227, Houston, TX 77253-3227

Metallizing Co. of America, Inc., 321 So. Hamilton, Sullivan, IL 61951

Oerlikon Welding Industries, Inc., P.O. Box 40964, Houston, TX 77240

## WINCHES AND FAIRLEADERS

Braden Winch Co., 800 East Dallas, Broken Arrow, OK 74012

CONMACO, Inc., 820 Kansas Ave., P.O. Box 5097, Kansas City, KS 66119

Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434

Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134

McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, W. Biloxi, MS 39531

Reel-O-Matic Systems, Inc., 418 Hellam Street, Wrightsville, PA 17368

Smith Berger Marine Inc., 516 So. Chicago St., Seattle, WA 98108

Stanspec Corp., 13600 Deise Ave., Cleveland OH 44110

Superior-Lidgerwood-Mundy Corp., 1101 John Avenue, Superior, WI 54880

## WINDOWS

Kearfoot Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, N.Y. 10550

## WIRE AND CABLE

Anacanda Ericsson Inc., Continental Wire and Cable, P.O. Box 1863, York, PA 17405

Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076

Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008

Delco Wire & Cable, Inc., 257 Rittenhouse Circle, Keystone Industrial Park, Bristol, PA 19007

Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055

Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

Tri-Mark, Inc., 8585 Industry Park Drive, Piqua, OH 45356

## WIRE ROPE—Slings

AISCO, 60 Grant Ave., Carteret, NJ 07008

Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008

Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018

A.L. Don Company, Foot of Dock Street, Malawan, NJ 07747

I & I Sling Company, 2626 Market Street, Dept. D, Aston, PA 19014

## ZINC

The Platt Bros. & Co., Box 1030, Waterbury, CT 06721

Smith & McCroken, 153 Franklin St., New York, N.Y. 10013

## New Tunnel Thruster Model Introduced By Omnithruster



Omnithruster Inc. president **Charles M. Aker** shown with company's new model OJ-M450 thruster that was unveiled at this year's Inland Waterways Conference and Trade Show.

Omnithruster Inc. of Santa Fe Springs, Calif., has introduced a new Omnitunnel Jet Module™ designed specifically for workboats, fishing vessels, barges, and dredge applications. The new model OJ-M450 is aimed at the conventional thruster market, and is said to be competitive in price with fixed-pitch tunnel thrusters.

Omnithruster president **Charles M. Aker** states, "the new concept has many advantages, some of which are: the units can be mounted in the bow or stern for side thrusting, or can be mounted in any part of the vessel where thrust is required. No gearbox is used, which improves water flow efficiency; additionally, there is no chance of oil pollution as all submerged bearings are water-lubricated. On ships with a wide beam, there is no need for a long tunnel that increases weight, or reduces buoyancy, and decreases thrust by adding resistance."

The new unit has a self-contained hydraulic motor rated at 100 hp input, 85 shp. The net thrust, allowing for installation losses, is approximately 2,000 to 2,200 pounds. Each module (two are required for side thrusting) is 30 inches wide, 54 inches deep, and weighs 786 pounds. Built to meet American Bureau of Shipping and U.S. Coast Guard specifications, the new units can meet other classification society requirements as well.

The units are versatile and can be mounted in many different positions. For shallow-draft vessels they can be installed so that only 2 feet 9 inches draft are required for full thrust. This makes them adaptable to barges and other vessels in light-ship conditions. Units can be combined in groups for greater thrust, and controlled as a single system.

Omnithruster manufactures a complete line of hydrojet maneuvering and propulsion systems ranging from 50 to 3,000 hp in single units. The company was founded in 1976 by **Stanley A. Dashew**, chairman. Omnithruster systems are installed in ships worldwide, including U.S. Navy vessels, arctic icebreakers, barges, fishing vessels, geophysical craft, and large oil tankers.

✓ For more information and free literature on Omnithruster,

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## Bell Aerospace Awarded Navy Contract For Final Phase Of Minesweeper Hunter Design



Artist's rendering of minesweeper hunter vessel that rides on a cushion of air. Bell Aerospace Textron is one of two companies participating in the final phase of the contract design and looks forward to participating in construction.

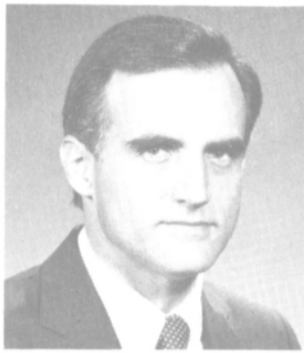
The U.S. Navy recently awarded a \$1-million contract to Bell Aerospace Textron of New Orleans, a division of Textron Inc., for the final phase of the contract design of a minesweeper hunter (MSH) that rides on a cushion of air. The award of this new MSH contract was announced by **John J. Kelly**, senior vice president and general manager of Bell Aerospace Textron, New Orleans Operation, and president of Bell Halter Inc.

On April 15 this year, Bell and three other companies received contracts for the initial contract design phase of the MSH program. Following Navy evaluation of the designs submitted by these companies, Bell received one of two contracts awarded for the second phase of the contract design. Upon completion of the contract design, Bell looks forward to participating in construction of the MSH vessel.

The MSH will be a new class of coastal minesweeper designed to insure that access to U.S. ports and coastal waterways can be maintained against a mine threat. The Bell design uses air cushion technology to isolate most of the hull from contact with the water surface. Compared with conventional minesweepers, the vessel will be less susceptible to underwater shock from mine explosions. The air cushion also reduces the underwater acoustic and pressure signatures of the vessel, making it less likely that today's sophisticated mines will be triggered before they can be detected and neutralized by the systems carried aboard the MSH. This concept offers a dramatic improvement, reducing the risk and cost of minesweeping.

Bell Halter Inc. is a company formed by Bell Aerospace Textron and Halter Marine, Inc. of New Orleans to construct air cushion vehicles and surface effect ships for military and commercial use. Halter Marine's minority interest in Bell Halter Inc. was recently acquired by Trinity Industries, Inc., when it purchased all of the outstanding stock of Halter Marine.

**Peter Crumbine Appointed  
President And COO Of  
International Marine Sales**



Peter J. Crumbine

Peter J. Crumbine has joined International Marine Sales as president, chief operating officer and director. He was employed for 18 years by Mobil Oil Corporation, with assignments that included managing director of Mobile Marine Sales Ltd. in London and general manager of Mobil Oil Portuguesa in Lisbon. Mr. Crumbine comes to IMS from the position of manager-corporate planning for Amerada Hess Corporation.

International Marine Sales, an affiliate of International Energy Corporation of Stamford, Conn., handles worldwide bunkering of ships, with main sales offices in Stamford, New York City, London, and Galveston.

**Todd Pacific Awarded  
\$6.4-Million Navy Contract  
For Work On FFG Frigate**

Todd Pacific Corporation, Los Angeles Division, San Pedro, Calif., has been awarded a \$6,411,419 cost-plus-fixed-fee contract for the post-shakedown availability of USS Tisdale (FFG-27). The Supervisor of Shipbuilding, Conversion and Repair, USN, Long Beach, Calif., is the contracting activity.

**Scotchman Industries  
Introduces New Circular  
Saw—Literature Available**

A new metal fabricating machine, the Scotchman Marathon circular cold saw model MC-325 and MC-325PV, was introduced recently by Scotchman Industries, Inc. of Philip, S.D. Both models are available with up to 13-inch blades with speeds of 30/60 rpm. These large, heavy-duty machines perform the big, tough jobs as well as the small ones.

The model MC-325PV features an automatic air vice that automatically clamps the material as soon as the blade is moved toward it, saving costly clamping time and increasing production 50 percent over the manual model. Seven models of Scotchman circular saws are available in various blade sizes and rpm.

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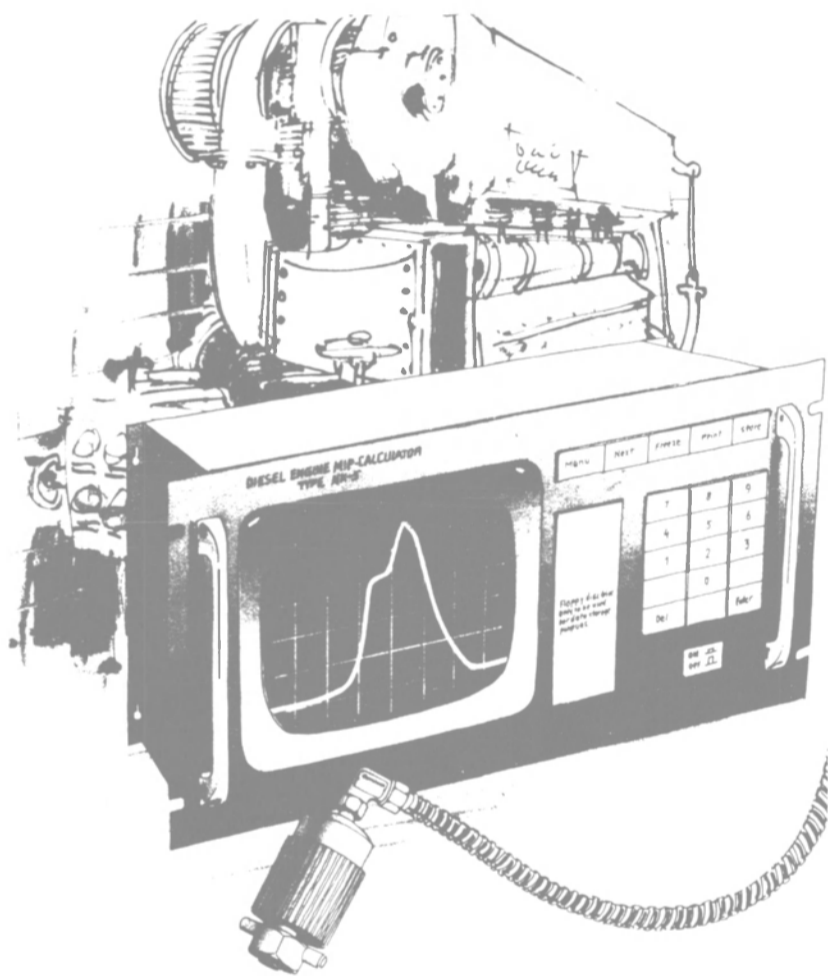
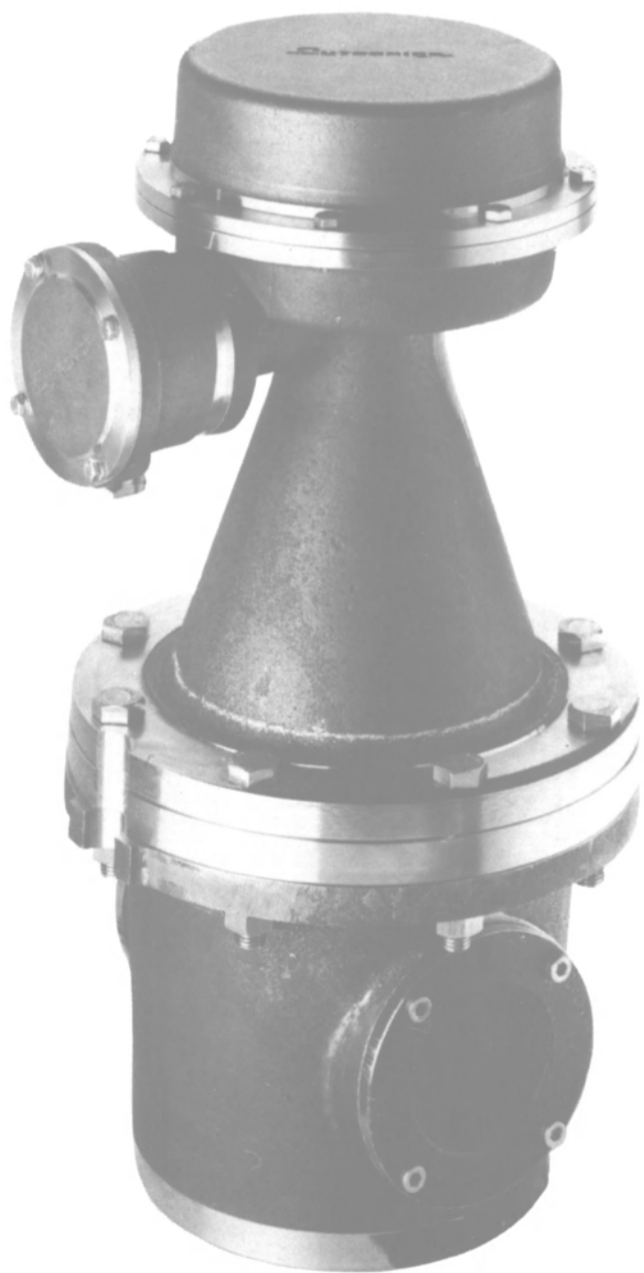
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